www.bio-based.eu

iBIB2011

International Business Directory for Innovative Bio-based Plastics and Composites

Published by nova-Institute GmbH and bioplastics MAGAZINE

iBIB2011

International Business Directory for Innovative Bio-based Plastics and Composites

Imprint

iBIB[2011] – International Business Directory for Innovative Bio-based Plastics and Composites
ISBN 978-3-9812027-4-8
15 €

Publisher:
Michael Carus (v.i.S.d.P)
nova-Institute GmbH
Chemiepark Knapsack
Industriestr. 300
50354 Huerth
Germany

Phone: +49 (0)2233 4814–40
Fax: +49 (0)2233 4814–50
contact@nova-institut.de
www.nova-institut.de/bio

Dr. Michael Thielen
Polymedia Publisher GmbH
Dammer Str. 112
41066 Moenchengladbach
Germany

Phone: +49 (0)2161 664 864
mt@bioplasticsmagazine.de
www.bioplasticsmagazine.de

Editor:
Dominik Vogt (nova-Institute)

Phone: +49 (0)2233 4814–49
dominik.vogt@nova-institut.de

Layout:
Jenny Feuerstein (nova-Institute)

Edition:
2011-03-22

Bio-based Products – The Definition

The term “bio-based products” has only been established a few years ago and aims at integrating a multitude of new materials and products based on renewable resources. Since last year the European pre-norm CEN/BT/WG 209 from 2010-07-04 determined the following terms and definitions:

biomass: material of biological origin excluding material embedded in geological formations and/or fossilized

bio-based: derived from biomass

bio-based product: product wholly or partly bio-based (Note: The bio-based product is normally characterized by the bio-based content)

The most used biomass, also called renewable raw materials (RRM), are starch, sugar, vegetable oils, (hemi)cellulose (timber, natural fibres, straw and other by-products) and special biomolecules such as lignin or natural rubber.

In the context of iBIB the proportion of these renewable materials in the bio-based products has to be at least 20%.

In contrast to traditional bio-based products such as particle boards or plywood, “novel” or “innovative” renewable materials are often converted by modern plastics-processing procedures such as extrusion, injection moulding, deep drawing or blown film. Typical examples are bio-based plastics – biodegradable and permanent, thermoplastics and thermosets, bio-elastomers, Wood Plastics Composites (WPC) and Natural Fibre Reinforced Plastics (NFRP) – both also called bio-composites.

Picture credits cover (from upper left to lower right): Ashland, Tecnaro, Club Bio.plastiques, Danisco, Natureworks, Werzalit, EIHA, Belgian Biopackaging, Polyone, Staedtler, Proganic, biotex, IAR, FKuR, Werzalit, Asta Eder, Ontario BioAuto Council, Fraunhofer IAP, SPI Bioplastics Council, Fraunhofer IAP, Biowert, DSM, GreenGran, GreenGran, Belgian Biopackaging, Polyvlies, procotex, Kosche, Rampf, Evonik, Greiner, biotex, Croda, EuropeanBioplastics, Technamation, JRS, BARK CLOTH, MERQUINSA, FNR, Cluster Biopolymers/Biomaterials, NGR, Werzalit

Welcome to iBIB[2011], the first international directory of major suppliers of bio-based plastics and composites worldwide!

The market for bio-based plastics and composites continues to grow at double-figure rate and has now gained true international status. However, the new market functions mostly based on 'insider- knowledge' and therefore lacks transparency. **The international business directory iBIB[2011] contains (for the first time) information on about 70 major companies, associations and R&D organisations from 17 countries on 4 continents.**

The iBIB[2011] will enable industrial suppliers and customers to reach out to one another. It will help companies to find the best bio-based solutions available worldwide within the sectors of bio-based plastics, composites and green additives. Via **print and PDF versions** the iBIB[2011] will reach ten thousand potential customers. The print version will be distributed by the publishers and partners at trade fairs, exhibitions and conferences worldwide, the PDF version will be sent to a wide audience by email and websites.

The **online database** with detailed index will help you to reach your supplier in a most targeted way. At **www.bio-based.eu/iBIB** you have free and direct access to the database with more than 100 specific criteria. Also the full PDF version is available for free.

Take a further look into the hundreds of different bio-based solutions for almost all conceivable applications and industry sectors. The bio-based revolution is already on its way – be part of it!

Kind regards

Michael Carus
CEO nova-Institute

Dr. Michael Thielen
Publisher of bioplastics MAGAZINE

iBIB[2012]

Your company, association or institute is welcome to join the business directory at any time and will immediately be included in our online database. You will also automatically be included in the next print edition.

www.bio-based.eu/iBIB

Publisher

Michael Carus
CEO nova-Institute

Dr. Michael Thielen
Publisher of
bioplastics MAGAZINE

Content

Engineering

Associations and Agencies

R&D and Consultants

Suppliers

ARKEMA

Foundation
- The Arkema Group was created in October 2004 from the reorganization of Total's Chemicals branch and spun off in 2006.

Turnover
- 5.5 billion €

Employees
- 13,800

Branches
- Vinyl Products
- Industrial Chemicals
- Performance products

Key Materials
- Bio-based polyamides

Key Products
- Rilsan®
- pebax® Rnew
- platamid® Rnew
- Rilsan® Clear Rnew
- Rilsan® HT

The world is our inspiration

Company

A global chemical company and France's leading chemicals producer, Arkema is building the future of the chemical industry every day. Deploying a responsible, innovation-based approach, we produce state-of-the-art specialty chemicals that provide customers with practical solutions to such challenges as climate change, access to drinking water, the future of energy, fossil fuel preservation and the need for lighter materials. With operations in more than 40 countries, 14,000 employees and seven research centers, Arkema generates annual revenue of € 5.5 billion and holds leadership positions in all its markets with a portfolio of internationally recognized brands. The world is our inspiration.

Even if only 4% of the world annual oil production is used as raw material for plastics, the chemistry of the future will partly result of various polymers and resins derived from bio-based feedstock. Increase the share of renewable raw materials and conserve save fossil resources is a core focus of Arkema's innovation.

Products

Developing chemicals from plants Bio-sourced plastics today account for 30% of Arkema's technical polymer business, taking up around 2/3rds of its R&D activity. These plastics feature properties that are equivalent or superior to those of their fossil-fuel-based counterparts.

Arkema's expertise in castor oil chemistry for over 60 years with its Rilsan® polyamide 11, 100% derived from this chemistry, recently helped bring out four new polymers:
- Pebax® Rnew, a biosourced elastomer up to 90% derived from castor oil,
- Platamid® Rnew, the first hotmelt adhesive entirely of renewable origin,
- Rilsan® Clear Rnew, the first transparent 54% biosourced polyamide
- Rilsan® HT, an ultra tough high temperature polymer fulfilling today's general need for lighter materials.

To enable its customer to identify products derived wholly or in part from renewable raw materials (over 20% carbon of non-fossil origin), Arkema has devised the «Arkema Renewables» label. The evaluation of the products' renewable carbon content is carried out by an independent body based on the ASTM 6866.

ARKEMA
The world is our inspiration

Innovation on sustainability aims at generating around 400 million euros new sales in next 5 years. Alternative energies, water treatment, composite materials and bio-plastics will be the main drivers of this innovation.

Castor oil, a long-running story Arkema now markets five families of polymers derived from castor oil. The eldest, Rilsan®, a polyamide composed of 11 carbon atoms, was synthesized by French chemists at the end of World War II. Initially used to make synthetic thread to competed with nylon, its applications soon grew to include cast parts and pipes. Today, Rilsan® polyamide-11 resin is employed in high-value-added applications requiring stamina and strength, such as vehicle gas lines and the flexible pipes used in offshore oil extraction. In the last several years, our expertise has enabled us to market four new families of castoroil-based technical polymers. These include Platamid® Rnew, a hot-melt adhesive made from totally renewable raw materials, Rilsan® Clear Rnew resin, the first fully transparent high-performance polyamide partly biosourced, Rilsan® HT resin for engineered parts subject to temperatures of up to 170°C, especially under automobile engine hoods, and Pebax® Rnew resin.

Contact

Arkema
420 Rue d'Estienne d'Orves
92705 Colombes Cedex
France

Phone: +33 (0)149 008 080
Fax: +33 (0)149 008 396
info.web@arkema.com
www.arkema.com

Contact Person

Christophe Lacroix, Ph.D.
Global Business Manager,
Global Bio-based Materials
Project Leader

ASHLAND

Foundation
- 1924

Turnover
- $ 9 billion (2010)

Employees
- 14,500

Branches
- Operations in more than 100 countries

Key Materials
- Specialty chemicals

Key Products
- Natrosol™ Plus 330 rheology modifier
- Aquaflow™ XLS nonionic synthetic associative
- thickener
- Soyad™ adhesives
- Purelam Fastcure™ laminating adhesive
- Klucel™ hydroxypropylcellulose
- Valvoline Premium Blue™ Extreme engine oil
- Valvoline Syn Gard™ FE gear oil
- Crepetrol™ creping additives
- Dimension™ lotionizing additives
- XxtraDura™ GMA cement additives
- Derakane™ epoxy vinyl ester resins

ASHLAND
With good chemistry great things happen.™

Company

Ashland Performance Materials, a commercial unit of Ashland Inc., is the number one global leader in unsaturated polyester resins and epoxy vinyl ester resins. In addition, it provides customers with leading technologies in gelcoats, pressure-sensitive and structural adhesives.

In more than 100 countries, the people of Ashland Inc. (NYSE: ASH) provide the specialty chemicals, technologies and insights to help customers create new and improved products for today and sustainable solutions for tomorrow. Our chemistry is at work every day in a wide variety of markets and applications, including architectural coatings, automotive, construction, energy, personal care, pharmaceutical, tissue and towel, and water treatment. Visit www.ashland.com to see the innovations we offer through our five commercial units – Ashland Aqualon Functional Ingredients, Ashland Hercules Water Technologies, Ashland Performance Materials, Ashland Consumer Markets (Valvoline) and Ashland Distribution.

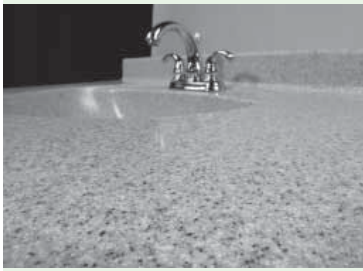
Products

Envirez™ Product Line and Properties Ashland's award winning Envirez resin is the first commercially available unsaturated polyester resin (UPR) comprised of rapidly renewable materials. Envirez resins are manufactured using an innovative patented process. The Envirez technology incorporates a variety of renewably sourced raw materials in the formulation.

High-performance Campion Chase 800 boat using Envirez resin.

ASHLAND
With good chemistry great things happen.™

Envirez resins meet the same performance and processing requirements of 100 percent petroleum-based UPR products and are used in a wide variety of processes and applications within the construction, marine and transportation markets. The Envirez line illustrates both Ashland's leadership in UPR technology and its commitment to introducing new products and services that reduce waste and promote sustainable business practices.



Application Processes
- Hand lay-up/spray-up
- Infusion
- Pultrusion
- Casting
- Solid surface

Markets served
- Transportation and agricultural equipment
- Marine
- Building and construction

Product properties
- Meets the same performance and processing requirements of other unsaturated polyester resins

Envirez resins are used together with natural fibers in the "Learning from Nature" pavilion from Danish architecture firm 3XN. Photograph courtesy of Adam Mørk.

Contact

Ashland Performance Materials
Carretera Reial 137–139
08960 Sant Just Desvern
(Barcelona)
Spain

Phone: +34 (0)93 206 5120
Fax: +34 (0)93 470 6858
PMEuropesales@ashland.com
www.ashland.com

BAFA – BADISCHE NATURFASERAUF-BEREITUNG GMBH

Foundation
- 1996

Turnover
- 1.5 million €

Employees
- 12

Branches
- Natural fibres industry

Key Materials
- Hempstraw

Key Products
- Hemp fibres
- Hemp shives and hemp seeds

BAFA – Badische Naturfaseraufbereitung is a young and private initiated natural fibres processing company

We have a vast amount of experience in developing and modifying natural fibres during the harvesting, retting and decortication stages. Our ambition is to modify Hemp fibres to meet the demands of our customers and our project partners at the highest levels of quality and durability.

The environment comes first in all our various approaches, thus BAFA strives to advance both economic and environmental concerns for the mutual benefit of each.

Facts about BAFA

- Established in 1996 after the cultivation of industrial hemp was legalized in Germany.
- Connector between agriculture and industry.
- BAFA processes hemp straw by mechanically separating the fibres from the shives.
- Three quality grades of hemp fibres are available for the consumer market and are sold on to industrial partners & clients for further processing.
- Cleaned and dust-free shives are utilized e.g. as horse bedding or in the construction business for structures of almost any kind.
- BAFA has developed a special combine harvester for hemp in cooperation with corporate partners Götz Inc. (Bühl/Moos), Deutz-Fahr Inc. (Lauingen) and the state-owned Landesanstalt für Pflanzenbau.
- BAFA is continuously involved in developing new products and solutions for our customers, e.g. pelletized fibres for compounding and injection moulding
- Active participant in different research project

Products

Fibres for industrial use

- Technical Fibres VF6 for non-woven applications:
  - Automotive industry
  - Insulation industry
  - Geotextiles
- Technical Fibres KF S20 for injection moulding
- Technical Fibres SKF 2 for injection moulding
- New Product: Hemp Fibre Soft Pellets

Shives, e.g. for horse bedding or for building and construction company

New Product:
Hemp Fibre Soft Pellets for compounds (PP-Hemp fibre).

Contact

BaFa Badische Naturfaser-aufbereitung GmbH
Stephanstr. 2
76316 Malsch
Germany

Phone: +49 (0)7246 92 575 – 0
Fax: +49 (0)7246 92 575 – 23
bafa@swol.de
www.bafa-gmbh.de

Contact Person

Bernd Frank

BARK CLOTH®_ EUROPE

Foundation
- 1999

Turnover
- $ 1.23 million (2010)

Employees
- 55 in Uganda, 4 in Germany

Branches
- Interior architecture
- Furniture
- Automotive

Key Materials
- Tree bark
- Banana fibre, palm fibre, elephant grass

Key Products
- Tree bark textiles
- Flexible/non-flexible composites
- Tree bark, banana and palm fibre reinforced bio-based plastics

Textiles and Composites from Tree Bark

Innovative Materials Meet Ancient Traditions Tree bark fleece from Uganda is the most ancient textile of mankind. The DLR German Aerospace Centre is testing it as a matrix in fibre composites, which show extraordinary flexibility and punching tenacity for use in planes. In 2008, it was declared a UNESCO World Cultural Heritage. It is the world's only material which has so far achieved this status.

The Ugandan-German family venture BARK CLOTH® is pioneer, innovation- and market leader of systematic bark tree fibre development and production. The permanently renewable bark is harvested every year without felling the tree. It is the basis for a wide range of textiles and flexible/non-flexible composites, which are manufactured in low-energy, partly CO_2-emission-free processes and distributed under the brand name of BARKTEX®.

Pure and unique surfaces: designers value the expressive character, unique texture and sensual tactility of BARKTEX®. Archaic authenticity: each piece is a unique specimen with it's own story. Exquisitely hand crafted, hence finished with state-of-the-art agents. Only bio-based polymers and biodegradable agents such as other fibres, lignin, fatty acids and natural oils and waxes are used. Production capacity 2011: 220,000 sqm.

For its efforts, BARK CLOTH® has been honoured with a number of internationally recognized industrial awards for material engineering, cutting-edge design, technical and social innovation. The former development aid project provides hundreds of craftswomen and farmers families with a secure income.

Uses: furniture, automotive/transportation sector, trade fair and exhibition architecture, wall coverings, illumination (lampshades, light sails), cases for household/electric appliances, fashion and footwear, displays and presentation, arts and crafts. Interiors at home, in hotels, restaurants, museums, and yachts.

Green and sexy: extremely fast growing renewable resource. Cradle2Cradle. Zero CO_2 emission processing. Eco certificates EEC 2092/91 for European Union and NOP for USA. Sustainable production on small-scale mixed-cultivation farms. No competition but complementarity to food cultivation. Externally judged high social rating score according to UN Global Compact principles.

Bark up the right tree!
Make your products unmistakable!

Contact

BARK CLOTH®_Uganda Ltd.
c/o BARK CLOTH®_Europe
Gewerbestr. 9
79285 Ebringen
Germany

Phone: +49 (0)7664 40315–60
Phone: +49 (0)700 BARKCLOTH
Fax: +43 (0)7664 40315–61
barkcloth@barkcloth.de
www.barktex.com

Contact Persons

Oliver Heintz
Mary Barongo-Heintz

COMPOSITES EVOLUTION LTD

Foundation
- 2009, Spin-off from NetComposites Ltd

Turnover
- 20,000 € (2009)
- 100,000 € (2010)

Employees
- 5

Branches
- Headquarters, sales and R&D (Chesterfield, UK)
- Manufacturing (UK)

Key Materials
- Flax
- Flax / PLA
- Flax / PP

Key Products
- Biotex high performance natural composites
- Yarns
- Fabrics – woven and non-crimp multiaxial
- Preconsolidated sheets

biotex
high-performance natural composites

Company

Composites Evolution is a supplier of innovative, sustainable materials including the Biotex brand of high-performance natural composite yarns, fabrics and sheets. Biotex is backed up by 130 years of experience in spinning, weaving and finishing natural textiles, coupled with decades of experience in composite materials, processing and applications. This gives Composites Evolution a unique capability in providing high-performance natural yarns, fabrics and preconsolidated sheets tailored to the requirements of composite products and processes.

Material

Biotex natural yarns, fabrics and preconsolidated sheets use a unique Twistless Technology to provide a combination of sustainability, performance and processability not previously seen in composites. For the first time, natural fibre composites can provide high levels of performance and the ease of processing normally associated with glass reinforced materials. There are 3 standard material options: Biotex Flax, Biotex Commingled Flax/PLA and Biotex Commingled Flax/PP.

Sustainability Flax fibres are renewable and have a low environmental impact during processing. The matrix in commingled Biotex Flax/PLA is also derived from crops, giving a 100% renewable material that can also be recycled or composted at the end of its life.

Performance Using Twistless Technology, the natural fibres in Biotex yarns are highly aligned to give up to 50% better fibre efficiency over conventional twisted yarns. The yarns are also easier to impregnate, giving improved fibre/matrix interaction and better performance.

Processing The twistless fibres in Biotex yarns allow fast wet-out and impregnation. Biotex Flax/PP and Biotex Flax/PLA commingled materials include an intimate blend of the reinforcement fibre and matrix polymer for easy processing by vacuum consolidation or press moulding.

Typical Properties

Property	40vol% woven Flax / PLA	40vol% woven Flax / PP	33vol% woven Flax / UP	30vol% UD Flax / UP
Density (g/cm^3)	1.34	1.13	1.33	1.32
Tensile modulus (GPa)	13.2	8.1	7.2	18.8
Tensile strength (MPa)	102	56	68	174
Elongation (%)	1.6	1.5	2.5	1.5
Charpy impact (kJ/m^2)	33	27	28	

biotex
high-performance
natural composites

Applications Biotex materials are suitable for semi-structural and decorative applications in a wide range of sectors including automotive, building & construction, marine, sports & leisure and consumer goods.

Products

Yarns Biotex yarns are designed specifically for composites and are available in a range of linear densities. They are suitable for processes including filament winding and pultrusion.

- Yarn linear density – 250tex (standard), 125–2000tex (on request)

Fabrics Biotex fabrics are available in a range of weave styles and fabric weights. They are suitable for processes including hand lay-up, vacuum infusion, RTM and thermoplastic composite processes.

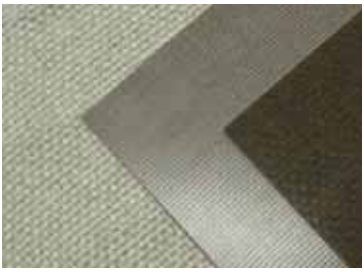
- Woven fabrics – 2x2 twill, 3H satin, 4x4 hopsack (standard), others (on request)
- Non-crimp fabrics – unidirectional, biaxial (standard), others (on request)
- Fabric weight – 400–550gsm (standard), 250–800gsm (on request)
- Fabric width – 1.25m (standard), up to 3m (on request)

Preconsolidated sheets Biotex Flax/PLA and Flax/PP can also be supplied as preconsolidated sheets in a range of thicknesses. They can be formed to shape by heating and stamp forming in matched press tools.

- Sheet thickness – 0.4–2.8mm (standard), others (on request)

Composition

- Flax
- Flax/PLA – 40% flax by volume (standard), others (on request)
- Flax/PP – 30% & 40% flax by volume (standard), others (on request)



Contact

Composites Evolution Ltd
4A Broom Business Park,
Bridge Way
Chesterfield S41 9QG
United Kingdom

Phone: +44 (0)1246 266244
info@compositesevolution.com
www.compositesevolution.com

Contact Person

Brendon Weager
brendon.weager@
compositesevolution.com

BIOWERT INDUSTRIE GMBH

Foundation
- 2005

Employees
- 10

Key Materials
- AgriCell[BW]
- AgriPlast[BW]

Key Products
- Insulation material
- Terrace profiles
- Stacking boxes
- Wallboxes

BIOWERT
bio based industry

Company

Founded in 2005, Biowert Industrie GmbH based in southern Hessen in the Odenwald operates an industrial grass-refinery that is unique throughout the world. A total of 10 employees have signed up to the reasonable utilization of renewable resources to produce products with high added value in the non-food sector. As raw material they use mainly meadow grass from nearby farms.

Method

Biowert developed the patented principle of “Green Biorefinery”, in which moist, fiber-containing biomass is fractionated into a liquid and a solid phase. This separation runs completely mechanical without any application of chemicals or organic solvents. All byproducts and waste materials are reused or supplied back to the production cycle. The high degree of automation of the process allows a production on an industrial scale. Stockpiling of raw material (grass silage) allows a year round production. The required process energy is provided by an affiliated biogas plant that runs on waste from the grass-refinery and sanitized food waste from the region. The result of this process is a purified and very high-quality cellulose fiber that is suitable for a variety of industrial applications. The Biowert plant is currently designed for an annual production capacity of 2,500 tons cell fibers.

BIOWERT
bio based industry

Products

With Agriplast[BW] Biowert produces a composite material that reduces the demand for oil in manufacturing-industries of plastic products by up to 75 percent. Depending on purpose the material consists of 40 to 75% cellulose fibers and only 25 to 60% of plastics such as PP, PE, PS or CA. Agriplast[BW] can be colored with any color pigments and easily be processed on conventional extruders and injection molding machines. The final products have interesting properties and are up to 20% lighter than the same form parts made from pure plastics. First commercial applications include for example terrace profiles, stacking boxes or wallboxes for electrical installation.

AgriPlast[BW]

Contact

Biowert Industrie GmbH
Gewerbegebiet Ochsenwiesen
Ochsenwiesenweg 4
64395 Brensbach
Germany

Phone: +49 (0)6161 806630
info@biowert.de
www.biowert.de

Contact Person

Klaus-Peter Bollin
Managing Director
kp.bollin@biowert.de

CRODA

Foundation
- 1925, Rawcliffe Bridge, Yorkshire, England
- Croda's corporate headquarter is located in Snaith, Goole, England

Turnover
- 912.2 million £ (2009)

Employees
- Around 3,500 worldwide

Branches
- Over 40 sales & marketing offices in 36 countries
- Over 20 production sites in all regions
- Innovation centres in all major regions

Key Materials
- Bio-based building blocks and speciality surfactants for high demanding engineering plastics and elastomer applications

Key Products
- Priamine – fully renewable dimer diamine
- Pripol – renewable dimer fatty acids
- Priplast – bio-based polyester polyols

CRODA

Coatings & Polymers – your natural choice

Croda Coatings & Polymers provides bio based solutions to the engineering plastics and elastomers market through its wide range of natural, high performance building blocks. Croda is the innovative partner, offering its customers the highest level of technical service, applications know-how and a variety of technologies.

Our range of environmental friendly solutions to the engineering plastics and elastomers market includes leading product brands as:

Priamine™, Pripol™ and Priplast™ bio-based building blocks These green building blocks find their use in high demanding engineering plastics and elastomer applications and offer the formulator a choice of characteristics such as:
- Flexibility (good impact resistance)
- Extreme hydrophobicity
- Affinity for a wide range of substrates
- Low melt viscosity, lubrication and flow
- 100% renewable carbon content

Recent green market introductions from Croda

New renewable chemistry

Priamine™ 1075 dimer diamine bio-based modifier for polyamide plastics and elastomers Priamine 1075 is a unique high purity C36 building block for use in high molecular weight polyamide engineering plastics and elastomer applications offering the following performance benefits:
- New bio-based modifier for high-end polyamides
- Improved flexibility or toughness (also at low temperatures)
- Enhanced melt flow properties
- Excellent moisture repellency for dimensional stability

CRODA

Formulation freedom Priamine offers new formulation possibilities enabling new and exciting high-end applications for example in electronics, transportation and sport.

100% renewability for green polyurethanes

Fully bio-based Priplast™ polyester polyol for polyurethane applications The new 100% bio-based Priplast range has been developed to meet the industry trend towards bio-based materials without compromising on performance.

Priplast – imparting green performance

The Priplast range of polyester polyols for polyurethane applications is based on natural fatty acids. Modifying resins with Priplast polyester polyols brings:

- Durability: a unique combination of thermo-oxidative, UV and hydrolysis resistance
- Flexibility
- Adhesion to a wide range of substrates, including low polarity plastics
- Excellent flow properties with efficient substrate wetting
- Renewable content

For more information on the full product portfolio of bio-based building blocks for polymers used in adhesives, coatings, foams, elastomers and engineering plastics, please visit www.crodacoatingsandpolymers.com and register for Croda's customer extranet.

Croda Coatings & Polymers – your natural choice

Contact

Croda GmbH
Herrenpfad Süd 33
41334 Nettetal
Germany

Phone: +49 (0)2157 8173–0
polymers.eu@croda.com
crodacoatingsandpolymers.com

Contact Person

Claus Ruttmann

DANISCO A/S

Foundation
- 1989 (as Danisco), listed on the NASDAQ OMX Nordic Exchange

Turnover
- 13.7 billion DKK (2009/10)

Employees
- 6,800 (june 2010)

Branches
- Operating in 80 locations in more than 40 countries

Key Materials
- Food Ingredients and Industrial BioTech
- World's largest producer of Food Emulsifiers
- Non-Food section takes Food Ingredients – glycerol ester chemistry – and introduces it into polymers

Key Products
- Anti-Stats
- Anti-fogs
- Mould Release agents
- Plasticisers (phthalate replacements)
- Industrial BioTech

DANISCO
First you add knowledge...

Company
Danisco's Non-Food section sits within the Emulsifiers Group, itself within 'Enablers' and under the umbrella of 'Food Ingredients'. With a rich and innovative portfolio, Danisco is a world leader in food ingredients, enzymes and bio-based solutions. Using nature's own materials, science and the knowledge of our 6,800 people, we design and deliver bio-based ingredients that meet market demand for healthier and safer products. Danisco's ingredients are used globally in a wide range of industries – from bakery, dairy and beverages to animal feed, laundry detergents and bioethanol – to enable functional, economic and sustainable solutions. Headquartered in Denmark and operating from more than 80 locations, Danisco's key focus is to become our customers' First choice and a truly market-driven global business. Find out more about our company at www.danisco.com

Material
Polymer Additives from Danisco give plastic manufacturers numerous opportunities to optimise the quality and performance of their products. Our innovative approach and strong desire to meet customer expectations are facilitated by a global network of subsidiaries and representatives that have made us the preferred partner for many players in the plastics industry.

Polymer Additives include bio-based plasticisers, anti-stats, anti-fogs, mould release agents and additives for EPS and polyolefin foams. Find out more about our Polymer Additives at www.danisco-plasticadditives.com (under construction). Find out more about our Plasticisers at www.danisco-softnsafe.com.

Products
Anti-Fogs for PE & PP Danisco offers very efficient anti-fogs for polyethylene film. It includes recommendations for LDPE, LLDPE, EVA copolymers and metallocene resins. Recommended solutions deliver outstanding performance in multilayer and laminated film. New polypropylene anti-fog solutions are available for both cold and hot fog applications:
- Food grade additives with a unique safety profile and worldwide approval for use in food contact applications
- New anti-fog technology with improved performance in complex laminated film structures
- Low use rates
- Low volatility and improved processing stability

DANISCO
First you add knowledge...

Anti-Stats for Polyolefins Danisco offers a wide range of highly efficient anti-stats for homopolymer, random- and impact copolymer polypropylene Injection moulding applications. Very efficient anti-stats are offered for LDPE, LLDPE and HDPE applications:

- Low volatility and improved processing stability
- Food-grade additive with a unique safety profile and worldwide approval for use in food contact application
- Highly efficient both short and long term
- Efficiency is obtained at low use levels
- Low volatility and improved processing stability
- Ideal replacement for ethoxylated amine antistat chemistry

Anti-Fouling for PP Danisco recommends a new anti-fouling additive for the polypropylene polymerisation process. Efficiency is high and it is the ideal candidate to replace any use of ethoxylated amines in this application:

- Food grade additives with a unique safety profile and worldwide approval for use in food contact applications
- Excellent anti-fouling performance at low use rates
- Good and efficient dispersion in the polymerisation process
- Low viscosity liquid. Easy handling and dosing

Mould Release for PP Danisco offers a technically competent and efficient mould release additive for polypropylene injection moulding applications:

- Food grade additives with a unique safety profile and worldwide approval for use in food contact applications
- High purity glycerol ester
- Good performance over lower purity glycerol monostearate material
- Works well in homopolymer, random copolymer and impact copolymer polypropylene
- Low volatility and high heat and process stability

Bio-based plasticisers for PVC, Acrylic, PLA etc Bio-based plasticiser for PVC responds to growing consumer and legislative pressure for safe and sustainable alternatives to phthalates and other plasticisers. A novel acetylated monoglyceride derived from hydrogenated Castor Oil, GRINDSTED® SOFT-N-SAFE belongs to a class of natural oils and fats that are globally approved as direct food ingredients:

- Based on renewable resources, fully bio-degradable and easily recyclable
- Easy processing characteristics mimicking DOP
- Low volatility
- High efficiency

Contact

DANISCO A/S
Edwin Rahrs Vej 38
8220 Brabrand
Denmark

Phone: +44 (0)7775 852719
www.danisco-softnsafe.com

Contact Person

Gwyn Pickering
Business Development Mgr.
gwyn.pickering@danisco.com

DSM

Foundation
- DSM

Turnover
- 7.7 billion € (2009)

Employees
- 22,700

Branches
- Life Science & Materials Science

Key Materials
- Specialty Resins and Engineering Plastics

Key Products
- Palapreg ECO
- Eco-PaXX
- Arnitel Eco

Company

DSM – the Life Sciences and Materials Sciences Company

Royal DSM N.V. creates solutions that nourish, protect and improve performance. Its end markets include human and animal nutrition and health, personal care, pharmaceuticals, automotive, coatings and paint, electrical and electronics, life protection and housing. DSM manages its business with a focus on the triple bottom line of economic performance, environmental quality and social responsibility, which it pursues simultaneously and in parallel.

DSM Composite Resins is the largest producer of structural resins in Europe and a technology and innovation leader for the composites industry. The company is globally expanding its activities in structural resins, especially in China, India, Turkey and the Middle East, targeting high added-value segments. In China, DSM is the leader in Specialty UPR and Vinyl ester resins.

Customers are supported via dedicated Centres of Excellence and served worldwide either directly from the facilities or in Europe via its Euroresins distribution network. DSM is also the world's largest producer of Glass Fiber Sizings & Binders under the Neoxil brand. DSM can claim unique competencies throughout the composites value chain. For more information visit the DSM Composite Resins website. www.dsmcompositeresins.com.

DSM Engineering Plastics is one of the world's leading suppliers of quality engineering thermoplastics providing customer value through sustainable solutions that reflect the DSM People, Planet and Profit strategy. DSM Engineering Plastics delivers innovative opportunities for customers who design or produce electrical applications, electronic equipment, cars, barrier packaging films as well as many mechanical and extrusion applications. These markets are served with a broad portfolio of high performance materials including Akulon® and Novamid® 6 and 66 polyamides, Arnitel® TPC, Arnite® PBT and PET polyesters, Yparex® extrudable adhesive resins, and Stanyl® high heat 46 polyamides.

Products

Knowing that traditional materials are made of finite resources like oil and gas, sustainability and responsible behaviour have gained importance over the past years in the World and within the industry. DSM's responsibility is to provide new Eco+ solutions to the Industry. Developing bio-based and bio-renewable material, DSM looks forward to a potentially limitless resource of advanced materials.

Creating an ecological benefit throughout the whole value chain (end-market segments e.g. transportation, electronics, packaging, wind energy, tanks, pipes & relining and building and infrastructure) in reducing energy use, emissions and waste is DSM's aim. ECO+ solutions, value with more environmental benefits, plays therefore a main role in this context and development.

Unlimited. DSM

DSM's reply to the ecological challenge is its eco-efficiency, elimination of hazardous substances, recycling and bio-based performance materials with improved LCA.

One example is Palapreg® ECO P 55-01 the resin with the highest bio-renewable content (55%) on the market ever without sacrificing processing standards and product performance. Palapreg® ECO P55-01 helps manufacturing industries meet tough sustainability targets and enables the value chain to move towards 'greener production' by enabling value-added end applications.

Another example is EcoPaXX™, a bio-based, high performance engineering plastic. Eco-PaXX™ is a polyamide (PA) 410, and belongs to the family of the "long-chain polyamides". It pairs typical long-chain polyamide properties, such as low moisture absorption and excellent chemical resistance, with high melting point (highest of all bio-based polyamides): ca. 250°C and high crystallization rate (typical for engineering plastics such as polyamide 66 and Stanyl polyamide 46). It combines the best of both worlds and is therefore suitable for many high-tech applications.

A next example is Arnitel Eco, a high performance thermoplastic copolyester (TPC) with a 20% – 50% content derived from renewable resources. These renewable resources are made from rapeseed oil, grown in areas where there is no competition with food crops. Arnitel Eco is the latest addition to the Arnitel family. Arnitel copolyesters combine the strength and processing characteristics of engineering plastics with the performance of thermoset elastomers. The material can perform well or even outperform in applications that normally require conventional rubbers. Arnitel Eco shows exceptional resistance against UV light and long term heat exposure.

Contact

DSM
Stetternerstr. 28
8207 Schaffhausen
Switzerland

Phone: +41 (0)52 644 1212
www.dsm.com

Contact Persons

Composite Resins:
Robert Puyenbroek
Director R&D
robert.puyenbroek@dsm.com

Engineering Plastics:
Fredric Petit
Sustainability Director DSM
Engineering Plastics
Phone: +31 (0)46 477 35 44
Fredric.Petit@dsm.com

EVONIK DEGUSSA GMBH

Turnover
- 13.1 billion €

Employees
- 39,000

Branches
- Specialty chemicals
- Energy
- Real estates

Key Materials
- Polyamides
- Polyphtalamide
- Poly ether ether ketone

Key Products
- High performance polymers: VESTAMID® and VESTAKEEP®

Company

Evonik Industries is the creative industrial group from Germany. In our core business of specialty chemicals, we are a global leader. In addition, Evonik is an expert in power generation from hard coal and renewable energies, and one of the largest private residential real estate companies in Germany. Our company's performance is shaped by creativity, specialization, continuous self-renewal, and reliability.

Our business line High Performance Polymers is specialized in manufacturing customized products and systems. We have been producing high-performance plastics for over 40 years.

Evonik has recently added a group of bio-based polyamides to its VESTAMID® family. The polymers, sold under the VESTAMID® Terra brand name, are based on monomers produced partly or entirely from fatty acids. The most important source is currently castor oil, obtained from the seed of the castor oil plant, which is not used as food or animal feed, so its cultivation does not compete with that of food crops. Evonik is also forging ahead with the development of further polyamides from renewables based on palm kernel and rapeseed oils. One of the driving forces for the development of bio-based polymers at Evonik is the company's own demand for more resource efficiency and greater sustainability for the raw materials used.

In addition to polyamides based on renewable raw materials, Evonik has also been producing polyamide 12 and 612 compounds and polyamide 12 elastomers (PEBA) for about 40 years, and, more recently, polyphthalamide compounds – all under the VESTAMID® brand name. Major manufacturers have been using all these materials for decades.

Material

People assume that natural fibers automatically mean less convenience or worse performance. The natural fiber-reinforced VESTAMID® Terra proves that this is not the case. Reinforced with materials such as bamboo fibers, the bio-based polyamide molding compounds have outstanding mechanical and physical properties and are in no way inferior to other engineering plastics. Thanks to their lower carbon footprint than exclusively petroleum-based polyamides, VESTAMID® Terra products make a significant contribution toward conserving fossil fuels and reducing the greenhouse effect. This is something that has been confirmed by TÜV, Germany's Technical Inspection Association.

Demand for organic materials has increased significantly over the last few years, due to continuously rising prices of petrochemical raw materials and customer concerns regarding sustainable protection of resources. With VESTAMID® Terra we are respecting customers' wishes and offering a bio-based alternative for high quality polyamide components such as are used in sports equipment, electronics, and automotive construction.

Products

Evonik currently offers two types of bio-based polyamides: VESTAMID® Terra DS is a 100% bio-based polyamide 1010, while VESTAMID® Terra HS is a polyamide 610 that contains approximately 60% renewable raw materials. Each type is available in two different viscosities as well as glass fiber-reinforced with a glass fiber content of 30% to 65%. VESTAMID® Terra DS is now also being marketed with 5% to 50% bamboo fiber reinforcement as a purely natural product. The DIN CERTCO organization for conformity assessment confirms the conformity of VESTAMID® Terra DS with the corresponding standards as > 85% bio-based.

VESTAMID® Terra molding compounds are semicrystalline and are thus distinguished by high mechanical strength and good resistance to chemicals and stress cracking. They also have high to very high heat deflection temperatures and a low absorption capacity for water, so that the good mechanical properties are retained even at high humidity. These compounds can be processed on all injection molding machines adapted for polyamide and are also suitable for filament production.

Bio-based polyamides can be used even for extreme applications. One polymer capable of particularly high performance is VESTAMID® HTplus – a polyphthalamide (PPA) that permanently resists external temperatures over 180 °C. It is used, for example, as a charge air duct in turbochargers. In the Lotus Exige sports, for example, VESTAMID® HTplus reduced the weight of the charge air duct by half compared to the metal duct, and also improved the flow properties – saving fuel and minimizing CO_2 emissions.

Contact

Evonik Degussa GmbH
Paul-Baumann-Str. 1
45772 Marl
Germany

Phone: +49 (0)2365 494 894
thomas.grosse-puppendahl@evonik.com
www.vestamid.com

Contact Person

Thomas Grosse-Puppendahl

FKUR KUNSTSTOFF GMBH

Foundation
- 2003

Branches
- Compounds
- Biodegradable & compostable resins
- Bio-based resins

Key Materials
- PLA-blends for extrusion and injection moulding
- Cellulose blends for injection moulding
- Natural fibre reinforced plastics

Key Products
- Bio-Flex®
- Biograde®
- Fibrolon®

Company

With the slogan “Plastics – made by nature!” FKuR Kunststoff GmbH was incorporated in 2003. In cooperation with the Fraunhofer Institute UMSICHT, Oberhausen, FKuR has developed a wide range of biodegradable plastics primarily made from renewable resource materials.

Generally, raw bioplastics (starch, PLA, PHA, PBS and others) are not easy to use on conventional plastics processing machinery. Only by smooth compounding processes and special additives mixtures it is possible to process the resulting blends like standard plastics.

The FKuR product lines Bio-Flex®, Biograde® and Fibrolon® meet the requirements for smooth processing on conventional plastics processing machines.

Biomaterials

Bio-Flex® The Bio-Flex® trade name indicates blends based on PLA, depending on the particular grade, with a very high content of natural resource material. Bioplastics in packaging generally replace conventional materials such as polyethylene of low density (PE-LD) and high density (PE-HD) as well as polystyrene (PS) and polypropylene (PP). Depending on the specific application, bioplastics have to meet different mechanical, haptic and optic criteria.

Bio-Flex® from FKuR has the following major advantages compared to competitive products:
- Very high content of natural resource raw material (depending on grade)
- Outstanding mechanical properties (similar to PE-LD, PE-HD and PP depending on grade)
- Highly transparent and glossy (depending on grade, three-layer film application)
- Superior barrier properties (Bio-Flex® S series and Bio-Flex® A series) or high breathability (Bio-Flex® F series)
- Processible on standard extrusion machinery with a high throughput, film can be down gauged to 8 µm thickness
- Higher temperature resistance than many other bioplastics
- Wide processing window (165 °C to 195 °C)
- Biodegradability and compostability as well as food contact approval certified by independent organisations.

Biograde® Injection moulding is the process used the most for the production of plastic parts worldwide. Typical application fields can be found in all branches of industry. As a mere example we shall state here the automotive sector, the construction industry, electronic and household articles, furniture and toys industry as well as medical technology. In addition to the processability on conventional injection moulding machines, special mechanical and temperature characteristics have to be met.

Biograde® compounds are based on cellulose and have the following advantages compared to competitive products:

- High content of natural resource materials
- Excellent heat resistance up to 115 °C (Vicat A)
- Injection mouldable on conventional injection moulding equipment
- Processible with multi-cavity moulds
- Properties comparable to ABS: rigid and transparent
- Food contact approved
- Biodegradability certified by independent organisations

Fibrolon® (natural fibre reinforced compounds – WPC) With the brand name Fibrolon® FKuR develops natural fibre reinforced compounds (Wood Plastics Composites, WPC), which unlike many other WPC can be injection moulded without problems. It is possible to convert Fibrolon® into complex profiles, panels and hollow profiles and/or into components for automotive interior. Fibrolon® compounds are characterised by a high strength and stiffness comparable to wood. Whereas the F series is made exclusively from biodegradable components, the P series uses a conventional polypropylene as matrix.

Contact

FKuR Kunststoff GmbH
Siemensring 79
47877 Willich
Germany

Phone: +49 (0)2154 9251 – 0
Fax: +49 (0)2154 9251 – 51
sales@fkur.com
www.fkur.com

Contact Person

Patrick Zimmermann
patrick.zimmermann@fkur.com

GREENGRAN B.V.

Foundation
- GreenGran B.V. was established in 2007, GreenGran BN (HK) Ltd was established in 2008

Turnover
- 1–5 million €

Employees
- 25

Branches
- Headquarters in Ede, the Netherlands
- Production, M&S (Asia) in Hong Kong
- M&S (N-China) in Beijing
- M&S (E-China) in Shanghai
- M&S (S-China) in Guangzhou

Key Materials
- Natural fibre reinforced PP, PHB, PLA/PHB

Key Products
- Injection moulded products
- Replacing oil-based engineering compounds

Company

Founded in 2007, GreenGran combines more than 30 years of industrial plastics processing with 15 years of R&D in bioplastics and natural fibre composites. As producer of bio-composite granules for injection moulding applications, GreenGran is ready to serve the bio-based economy. Our innovative materials can economically and technically compete with traditional engineering plastics. Our team of skilled technicians and our sustainable, recycle-able and cradle-to-cradle product range enable us to provide smart and green solutions, matching your requirements. Instead of supplying just granules, we also assist end-users in matching product specs with the right material compositions and we assist operators in setting the right product processing parameters.
Our current production is located in Hong Kong. Increased capacity is projected for 2012, including production in Europe.

Material

The material properties of our granules are such that they compete with engineering compounds. This applies for properties like stiffness, strength, high heat tolerance (HDT). Typical engineering compounds to be displaced are: PP-glassfibre, High Heat ABS, PC/ABS.

Our granules encompass a number of unique qualities, such as:
- bio-based: partly for PP-based fibre compounds, up to fully for PLA -based fibre compounds; this addresses global policies regarding CO_2 reduction and oil-dependence
- recycle able for PP-based fibre compounds and for PLA -based fibre compounds
- biodegradable for PLA -based fibre compounds
- flame retardant for specific grades, using halogen-free additives
- clean fuel pellets at the end of their life cycle (not applicable for flame retardant grades)

Not only do we supply granules, we provide smart solutions for our customers and for their customers. This means that we first select suitable

material grades, based on the final product requirement. Next, we advise injection moulders on-site on how to process our materials to products.

At present our standard grades include:

- **GGN023J** – General purpose grade, granules based on polypropylene and natural fibres, which combines high stiffness with moderate impact strength. Designed for production of complex articles with long flow paths and thin walls.
- **GGN026J** – Engineering grade, granules based on polypropylene and natural fibres, which combines very high stiffness and strength with moderate impact strength. Its excellent thermal properties and dimension stability make it suitable for use under high temperature conditions.
- **GGF023J** – General purpose flammability grade, granules based on polypropylene, natural fibres, and halogen-free additives, which combines high stiffness with V0 flame retardant properties at thin wall. Designed for production of complex articles with long flow paths.
- **GGF023J-SP** – Special purpose flammability grade, granules based on polypropylene, natural fibres, and halogen-free additives, which combines high stiffness with 5VB flame retardant properties and V0 at thin wall.
- **GGB621J** – Standard heavy-weight waterworks grade, granules based on polypropylene and natural fibres, which combines very high stiffness and strength with moderate impact strength. Its excellent outdoors properties and moisture stability make it suitable for sweat- and salt water use.

In case our standard grades do not meet the needed product requirements, we can develop suitable tailor-made grades.
Being agent in Europe, GreenGran also supplies all PHB-based grades from Tianjin Green BioScience Co., Ltd. (Green Bio).
Contact us for detailed info on material properties, price ranges, and for matching our materials with your bio-based product needs.

Products

Our client's product portfolio is very diverse. Roughly, product-market combinations are as follows:

- PP-based natural fibre flame retardant compounds for E&E industry: housings, audio/video, household, cookware, personal care and electricity covers.
- PP-based NF compounds for industrial construction parts, toys, waterworks, civil works, railway.
- PLA-based biodegradable natural fibre compounds for gardening and waterworks.

Examples of typical products are Mayamax' BioCharger Family and Anome's Ground Consolidator.

Contact

GreenGran B.V.
Galvanistraat 1
6716 AE Ede
The Netherlands

Phone: +31 (0)85 7 857 501
info@greengran.com
www.greengran.com

Contact Person

Martin Snijder
martin.snijder@greengran.com

GREENVALUE

Foundation
- 2003

Employees
- ~ 30

Branches
- Switzerland
- India
- USA

Key Materials
- Wheat straw
- Flax
- Sugarcane bagasse
- Other annual fibers
- Wood

Key Products
- Sustainable aromatic polymers derived from lignin and other plant polyphenols

Company

GreenValue is a company headquartered in Switzerland, which is focused on producing, developing, and commercializing sustainable, value-added products from lignocellulosic biomass.
We are the only industrial producer and marketer of high-purity sulfur-free lignin products worldwide. Our production facilities are in India, and we have a market presence in Europe, Asia and the Americas. Our products are used industrially and also in animal nutrition applications.

Technology

Lignin (which is present in all plant material intimately associated with cellulose) is the most abundant aromatic biomaterial. We view it as the logical platform for the production of green aromatic chemicals that could replace those currently derived from oil and coal.
Our patented technology for producing sulfur-free lignin is currently used industrially in conjunction with the manufacture of high quality papers from annual fibers such as wheat straw. In our process, a lignin-laden aqueous alkaline extract obtained by digesting the plant feedstock in aqueous sodium hydroxide is processed to generate a high-purity dry lignin powder. This product is radically different from lignins made by other companies, which contain covalently-bound sulfur, a fact that limits their use.
Our production technology can also be applied to streams from other biomass processing operations. Thus, we anticipate that significant quantities of lignin-precursor streams will become available as co-products when emerging biorefinery processes take off and start industrial production of next-generation biofuels from biomass. GreenValue has already confirmed experimentally that in many of those situations application of the company's technologies can result in high-purity lignin fractions suitable for attractive markets.

Products

The unique biopolymer produced by our technology is characterized for its high lignin content (more than 90% purity) and low content of ash and carbohydrates. Unlike lignosulfonates and kraft lignins, GreenValue's product is free of covalently bound sulphur. It is a biopolymer with very low water solubility at neutral and acid pH. Under alkaline conditions, complete solubility is achieved.

	GreenValue's Product from Soda Pulping	Green Value's Product from Biorefinery Processes
Lignin, %	> 90	> 90
Ash, %	< 2	< 2
Carbohydrates, %	< 4	< 2
Sulfur, %	Nil	Nil
Aromatic-OH, nmole/g	~ 2	2–3
Acid No., mg KOH/g	20–50	5–15
Softening Temperature, °C	200	> 200
Water Solubility (neutral or acid)	Very Low	Very Low
Water Solubility (pH 12)	Complete	Complete

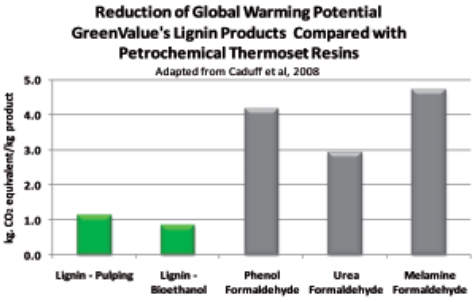
In addition to producing this unique building block, the company has developed proprietary technologies to modify its functionality and properties. The modified products are part of the Protobind® product line, which includes biopolymers with properties tailored to meet the requirements of various markets, such as a specific softening point, compatibility with given polymeric systems, or a particular functionality. Some of our grades can be used as partial replacement for phenol and formaldehyde during the synthesis of thermoset resins, while others are used as partial substitutes of the finished resins themselves. Our products are employed in a range of industrial applications encompassing wood adhesives (for instance, for plywood and oriented strand board panels), high pressure laminate resins, foundry sand binders, refractory binders, novolacs, and molding compounds, among typical thermoset resin applications.

GreenValue's lignin products are also an important ingredient in thermoplastic fiber composite formulations, such as those based on flax and other natural fibers. Our enhanced hydroxyl functionality derivatives are also excellent candidates to be used as polyols in urethane systems, and are particularly compatible with rigid foam applications.

Our lignin-based products, in addition to being able to participate in various polymeric networks, offer remarkable functional properties. For instance, they are hindered phenols, thus exhibiting antioxidant properties. They are already used for their antioxidant characteristics in construction products such as bitumen and are ideally suited to play a similar protective role in renewable polymer formulations, including degradable ones. High purity lignin products, such as GreenValue's, are also known for their fire resistance.

From the environmental point of view, life cycle analysis has shown that GreenValue's products can significantly reduce the carbon footprint, when compared with fossil-based thermoset resins. For instance, relative to phenolic resins our lignin products show a reduction of about 75% in Global Warming Potential (kg CO_2 equivalent).

While GreenValue's lignin based building block is characterized for its low water solubility, our rich product pipeline has under advanced development highly polar, water soluble biopolymers. We are also developing derivatives with enhanced compatibility with non-polar materials.



Contact

GreenValue
7 Camby Chase Rd
Media, PA 19063
USA

Phone: +1 (610) 416–2291
www.greenvalue-sa.com

Contact Person

Dr. Jairo H. Lora
jhlora@greenvalue-sa.com

HEMPFLAX

Foundation
- 1993

Turnover
- > 2 million €

Employees
- 15

Branches
- Automotive
- Agricultural, green house production, garden
- Equistrian, small animals
- Supplier of top quality natural fibers
- Partner in developments
- Project partner
- Supplier of knowhow and technology
- First mover advantages
- Reliable supply thanks to safety stock and risk spreading

Key Materials
- Hemp
- Flax

Key Products
- Hemp / Flax fibre
- Non-wovens
- Hemp shives for animal bedding
- Hemp shives for construction

Company
HempFlax in Oude Pekela, the Netherlands, manufactures and processes durable raw materials, semi-finished products and end products made from ecologically cultivated fibre hemp and flax. With its professional approach to the development and innovation of recyclable natural fibre products, HempFlax is the first link in a sustainable industrial chain.

Material
This industrial production chain is a result of sustainable agriculture. Every year, HempFlax obtains new natural fibres, particularly fibre hemp, through contract cultivation with arable farmers in the Netherlands and Germany. By putting recyclable raw materials on the market, HempFlax has gained a leading position in this innovative industrial development. Its main objective is to produce recyclable raw materials for industrial end products and commodities for the consumer market.

HempFlax gives entrepreneurs and consumers the opportunity to give substance to their responsibility for the environment. The sustainable chain functions according to the universal environmental thinking and awareness of right-minded people aimed at continuing the ecological circle as long as possible. Entrepreneurs, managers, banks and consumers should make an effort to use the possibilities afforded by HempFlax.

Products
With its vision and innovative decisiveness, HempFlax in the Netherlands and Germany gives meaning to the term agrification. By providing recyclable raw materials, environmentally harmful synthetic fibres made of fossil raw materials – such as nylon and plastics – can be replaced by fibres made of recyclable raw materials.

Product	Year capacity
Bulkfiber Hemp	1,600 metric ton
Bulkfiber Flax	1,000 metric ton
Hemp/Flax shives	5,000 metric ton
Hempfiber non-wovens	
Hemp insulation material	

Contact

HempFlax Marketing B.V.
H. Westerstraat 20–22
9665 ZJ Oude Pekela
The Netherlands

Phone: +31 (0)597 615–516
Fax: +31 (0)597 615–951
mark.reinders@hempflax.com
www.hempflax.com

Contact Person

Mark Reinders

H. HIENDL GMBH & CO. KG

Foundation
- 1964

Employees
- 60

Branches
- Plastics engineering
- Compounding
- Tool shop

Key Materials
- Hiendl NFC®

Key Products
- Semi-finished and finished goods using extrusion methods and injection moulding

USP (Using Selling Proposition)
- Own tool shop
- Own compounding

hiendl
wir formen ideen

Company

H. Hiendl GmbH & Co. KG is a modern producer and service provider in the field of plastics engineering. The company, located in Bogen/Furth near Straubing in Lower Bavaria, employs a little more than 60 staff.

Hiendl makes products and components using injection moulding and extrusion methods. Our designs are partly based on the ideas of our development staff, but partly also on customers' ideas. Besides conventional polymers, we increasingly use natural fibre reinforced plastics. In addition to products and components, Hiendl also develops materials according to precisely defined customized property profiles.

Our development competence reaches back more than forty years. Before Hiendl started to produce plastics, the company had been providing services in various fields of engineering science. The continued successful commitment in that line is reflected in a highly diverse range of product and material developments, supported by numerous patents and utility models.

Innovative Biomaterials

For some years now, H. Hiendl GmbH & Co. KG has been intensively concerned with the development of innovative materials. The central issue in terms of research and development activities has been the quality-oriented use of renewable raw materials. Proof of the success of that commitment is provided by the Hiendl NFC® product line – an array of natural fibre reinforced plastics which, thanks to their versatile property profiles, are excellently suited for a broad spectrum of products.

Products and processes have been originated by our own research and development department. All process steps, including compounding, are carried out on our own premises by means of modern machinery.

Hiendl NFC® (natural fibre composite) materials consist of synthetic polymers and renewable raw materials. The pioneer product is Hiendl Xylomer®, in which wood is the crucial natural fibre material. Other natural fibres are added for the differentiated design of qualities.

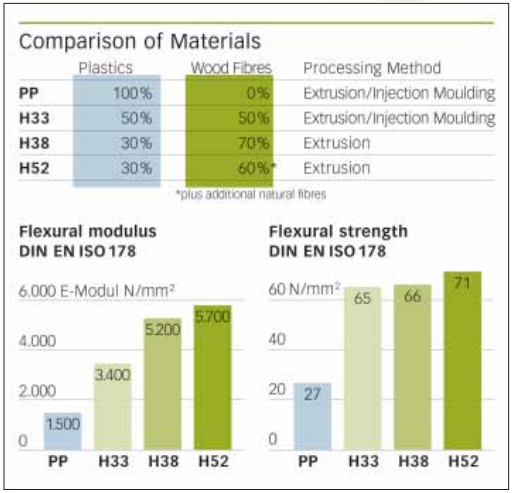
hiendl
wir formen ideen

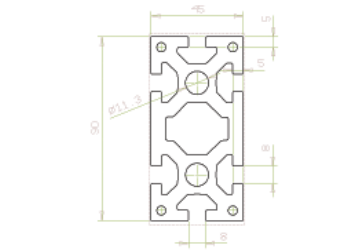
Excellent Qualities In comparison with alternative synthetic materials, Hiendl NFC® materials stand out above all by virtue of their excellent solidity. With over 70 N/mm², these materials can be more than twice as strong as polypropylene. With appropriate design, rigidity can reach over 5,500 N/mm², which is more than three times the value of polypropylene. By reinforcement with natural fibres, it is possible to achieve rigidity values as we know them from glass fibre reinforced polyamide.

Being very light in weight, Hiendl NFC® materials recommend themselves in many cases as substitutes for aluminium. They have impressive ecological qualities, and their value for money is remarkable.

In comparison with natural source materials, in particular wood, Hiendl NFC® materials convince through their superior formability. Owing to the way they are processed, their surfaces are immediately ready for use, so that no painting or coating is actually required.

Designing Individual Property Profiles Depending on the raw materials used and on quantity ratios, Hiendl's sophisticated process technology can create a large variety of very specific property profiles. We have been doing research on the use of natural fibres such as hemp, flax, various woods, and many others. The property profile of this ground-breaking composite material is marked both by the properties of the synthetic and natural materials used as well as by the quantity ratios applied.





Contact

H. Hiendl GmbH & Co. KG
Industriestr. 5+6
94327 Bogen/Furth
Germany

Phone: +49 (0)9422 8518–0
Fax: +49 (0)9422 2442
nfc@hiendl.de
www.hiendl.de

Contact Person

Ulrich Kizak
Phone: +49 (0)9422 8518–27
u.kizak@hiendl.de

HUNTSMAN ADVANCED MATERIALS GMBH SWITZERLAND

Foundation
- 2003

Employees
- 2,300 worldwide

Branches
- Chemistry

Key Markets
- Aerospace
- Automotive
- Coating & Construction
- Electronics
- Marine
- Electric Engineering
- Wind
- Sport & Leisure
- Rapid Manufacturing

Key Technologies
- Adhesives
- Composites
- Tooling
- Casting
- Encapsulating

HUNTSMAN
Enriching lives through innovation

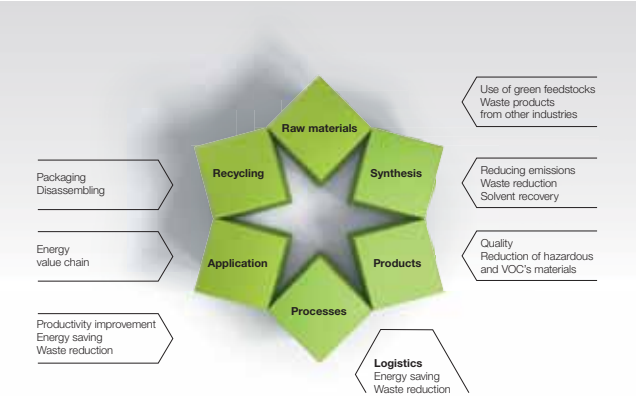
Company

We are a leading global supplier of synthetic and formulated polymer systems for customers requiring high-performance materials which outperform the properties, functionality and durability of traditional materials. Over 2,300 associates at 13 locations worldwide work to fulfill this promise day by day.

More than 9,000 companies around the world use Huntsman Advanced Materials technologies in key markets such as adhesives and inks, aerospace, automotive, coatings, construction, electronics, medical, marine, power generation, transmission and distribution, sports equipment and wind.

Our sustainability program

At all steps of their life cycle, our innovations and processes are designed to respect the environment.



Material & Products

Thermosetting Resins Araldite® DY-CNO and Araldite® DY-S are low viscosity epoxy functional reactive diluents, produced using up to 85% biorenewable raw materials.

Liquid epoxy resins based on glycerine and other biorenewable raw materials are available on request.

Aradur® polyamidoamides such as Aradur® 115, Aradur® 125, Aradur® 140, Aradur® 450 etc. are curing agents for epoxy resins that contain up to 80% biorenewable raw materials, mainly derived from plant fatty acids and by-products from the paper pulp industry.

Aradur® Phenalkamines such as Aradur® 3440, Aradur® 3441, Aradur® 3442, Aradur® 3462 etc. are curing agents for epoxy resins, produced using up to 60% biorenewable raw materials, derived from Cashew Nut Shell Liquid (CSNL) which is a by-product from cashew nut production.

HUNTSMAN

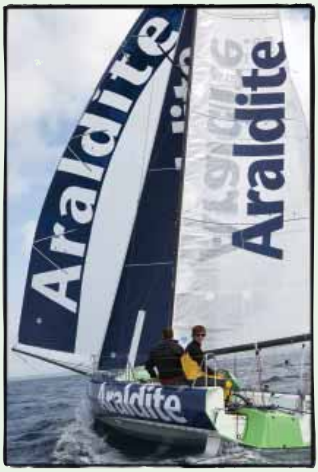
Enriching lives through innovation

Thermosetting resins are used in a wide variety of applications such as high performance coatings, liquid flooring materials, adhesives, castings and polymer concrete. Huntsman Advanced Materials are continuously developing new products in this filed, based on a variety of biorenewable raw materials.
In the particular market of electrical insulation, Huntsman Advanced Materials is supplying tailor-made prefilled systems for encapsulating electronic components for automotive, telecom, lighting and general industry applications. Either based on epoxy or on polyurethanne chemistry, these systems are prepared with natural raw materials levels up to 60 or 75% respectively. Well known in these industries, our systems offer proven reliability and durability while fullfilling all the strict certifications required for such high-end applications.

Thermoset Adhesives Industrial and DIY adhesives based on epoxy and polyurethane chemistry both utilize significant and increasing proportions of biorenewable materials, for example natural polyols from castor oil and polyamidoamides based on plant fatty acids and by-products from the paper pulp industry.
Thermoset Adhesives are used for high performance adhesive applications ranging from aerospace and automotive adhesives through to high performance DIY adhesives for use at home.

Thermoplastics Euredur®, Euremelt® and Euretek® thermoplastic polyamides, contain up to 60% of biorenewable raw materials, mainly derived from plant fatty acids and by-products from the paper pulp industry.
These thermoplastic materials are used as hot melt adhesives for applications such as high performance shoe adhesives, textile adhesives and in automotive applications. They also find use in low pressure overmoulding applications such as encapsulation of electronic modules and electrical connectors. Direct application, as scratch protection for articles as varied as cell phones up to concrete roof tiles. Perhaps the biggest single use is in inks and coatings where they are used as binders for packaging inks as well as adhesion promoters in automotive underbody protection.

Bio Composites Besides bio-composites obtained from a matrix not derived from crude oil, we put a strong focus on systems compatible with natural fibers in replacement of synthetic fibers (glass, carbon, …). Thus, our epoxy infusion system Araldite® LY 1584 / Aradur® 3487 is commonly used to produce flax fiber composite structures with mechanical properties equivalent to those of the composites reinforced with glass fibres. A wide range of applications is then possible as shown by the Araldite® 6.50 racing boat.



Araldite® Boat.

Contact

Huntsman Advanced Materials GmbH Switzerland
Klybeckstr. 200
4057 Basel
Switzerland

Phone: +41 (0)61 2 991 111
advanced_materials@huntsman.com
www.huntsman.com/advanced_materials

Contact Person

Alex Dureault
alex_dureault@huntsman.com

KOSCHE PROFILUMMANTELUNG GMBH

Foundation
- 1968

Turnover
- 100 million €

Employees
- 380

Branches
- DIY market
- Building material/nutrient market
- Timber product market
- Industrial market
- Landscape gardening
- Wholesale

Key Materials
- Solid wood
- Wood-based materials
- Décor foils
- Veneers
- WPC compounds

Key Products
- WPC
- Skirtings
- Panels

KOSCHE® Unternehmensgruppe

Kovalex® Das High-Tech-Holz

100% PVC frei

Qualitätsgemeinschaft Holzwerkstoffe e. V.

Kovalex®-Facade

Company

The business group KOSCHE Profilummantelung was founded in 1968. Today KOSCHE is in the position to stand in the forefront of a leading producer for complete solutions of profile-wrapped components for the interior and exterior use.
Since the year of 2000 the consortium KOSCHE Unternehmensgruppe concentrates on the production process with wood polymer composites products and is therefore seen as a pioneer of the branch. Kovalex® has become a well known brand within the variety of WPC products.

Products

Kovalex® has the optical appearance and the surface feel of wood. The high tech material consists of 70% wood and 30% of polymers and additives. It is an environmentally friendly product, 100% free of PVC and completely 100% recyclable.

Kovalex®-Connecting hinges

Kovalex®-Terrace

Kovalex®-Window sill

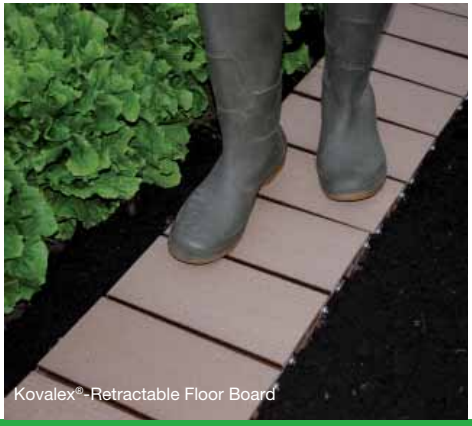
KOSCHE®
Unternehmensgruppe

Kovalex®-Fence

Kovalex®-Profiles

The main products in the range of Kovalex® are boards in different shapes and colours. The complete decking-board system is easy to install with exceptional designed clip systems. More products are siding, fencing and industrial profiles and others. KOSCHE is the flexible partner for individual and costumer specific products. The special know how obtained over 10 years of experience. The complete production process is managed in one hand and guarantees high quality of wood-polymer-composites. Kovalex® achieved all of the high demands of the quality seal. These are quality and test requirements for wood polymer composites from the Association of the German Timber Product Industry.

The manufacture of Kovalex® is located in Mittenaar-Bicken near Frankfurt/Main. There are 9 extrusion lines. KOSCHE produces about 6 millions running meters of Kovalex® annually.



Kovalex®-Retractable Floor Board

Contact

KOSCHE
Profilummantelung GmbH
Bövingen 100
53804 Much

KOSCHE
Profilummantelung GmbH
Abteilung Kovalex®
Hauptstr. 36
35756 Mittenaar-Bicken
Germany

Phone: +49 (0)2772 601 397
Fax: +49 (0)2772 601 207
www.kosche.de

Contact Person

M.Sc. Marc Brockerhoff

MERQUINSA

Foundation
- 1964

Branches
- Merquinsa North America
- Merquinsa Asia Pacific

Key Materials
- TPU (Thermoplastic polyurethanes)
- Bio TPU Specialties (Renewable-sourced thermoplastic polyurethanes)

Key Products
- Bio TPU resins for a wide range of adhesives and thermoplastic elastomers applications (injection moulding, calandering, compounding, extrusion and hot melts)

merquinsa
The TPU Specialty Company

Company

Merquinsa is a leading thermoplastic polyurethane (TPU) specialty producer, providing innovative products for injection moulding, extrusion, calandering, compounding and adhesive applications. Merquinsa's headquarters are in Barcelona, Spain with regional centres in Asia and North America.

Merquinsa was granted the Frost & Sullivan 2008 Global Thermoplastic Urethane (TPU) Product Innovation Green Excellence of the Year Award. This award recognizes Merquinsa's innovation in biopolymers, with its groundbreaking Bio TPU made from renewable carbon resources and successfully marketed globally under Pearlthane® and Pearlbond® ECO brands.

Major brands use Bio TPU from Merquinsa for a wide range of consumer and industrial applications (Brooks Sports Inc., Smith Optics Inc., Ford Motor Company, etc.).

Material

Merquinsa manufactures Thermoplastic polyurethanes (TPU) supplied in pellet form for moulding, extrusion, compounding, calandering and adhesive applications.

Bio TPU, uses a breakthrough proprietary technology and is made from renewable sources with bio-based content ranging from 20% to 90% according to ASTM-D6866.

It is an alternative to petroleum-based TPU products for adhesive and elastomer industries, such as: textile coating, hot melts, watch belts, sport & leisure goods, footwear, automotive, consumer electronics, and other sectors that value "green" raw materials.

Transparent and Aliphatic TPU resins are also available for injection moulding and extrusion for outstanding aesthetics.

The elastomeric product families exhibit an optimum balance of properties:
- Excellent abrasion & scratch resistance
- High tensile, compressive and tear properties
- Low temperature flexibility and impact properties
- Good oil and fuel resistance
- Fast cycling for low part cost
- Adhesion to polar substrates for co extrusion or 2K moulding applications
- Transparency
- Recyclability

merquinsa
The TPU Specialty Company

Products

PEARLCOAT® TPUs for calandering and sintering.

PEARLTHANE® TPUs for extrusion, injection moulding and compounding.

PEARLSTICK® TPU for the solvent-based adhesives industry.

PEARLBOND® TPU used as additives for Reactive Hot-Melts (RHM), as well as for application in heat sealable fabrics and for the production of toe puffs & counters.

Photo Courtesy of Brooks Sports Inc.

BIO TPU

PEARLTHANE® ECO RENEWABLE-SOURCED Bio TPU portfolio for extrusion and injection moulding applications.

PEARLBOND® ECO RENEWABLE-SOURCED Bio TPU portfolio for PU RHM for automotive/furniture /textile, as well as Bio TPU for footwear, heat sealable fabrics and textile coatings.

Part of Merquinsa's new green technology which has driven the development of the Renewable-sourced product ranges above, was funded by a project to promote its ECO brands in the footwear industry (ECO/2009/255887 – ECOTPU).

bio tpu® by merquinsa

eco-innovation

Contact

MERQUINSA
Gran Vial, no. 17
08160 Montmelo (Barcelona)
Spain

Phone: +34 (0)93 5 721 100
info@merquinsa.com
www.merquinsa.com

Contact Person

Lidia Valcarcel
lvalcarcel@merquinsa.com

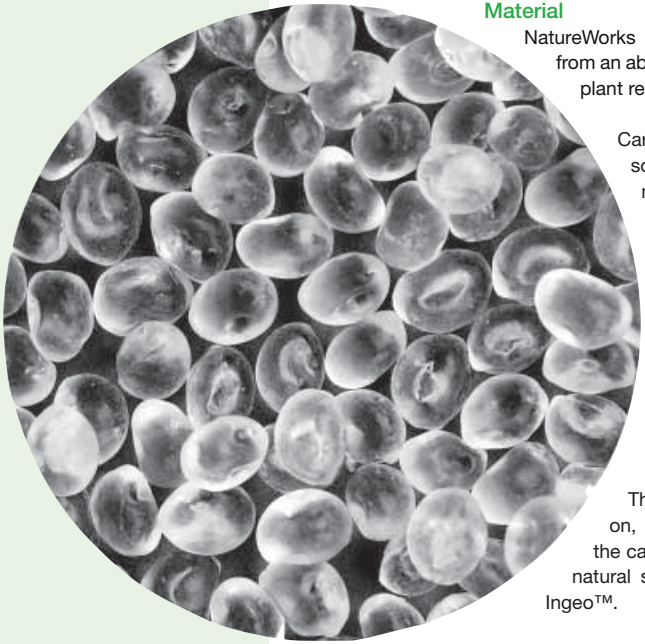
NATUREWORKS LLC

NatureWorks LLC

Company

NatureWorks LLC is the first commercial scale manufacturer and global supplier of polylactide biopolymer, which it markets under the Ingeo™ brand name. The company has the capacity to meet the growing business and consumer demands for attractive, affordable and renewably sourced, products that can be made from this new generation of nature based plastics and fibers.

The company was created to lead the commercial market adoption of plastics and fibers made from 100% annually renewable resources.



Material

NatureWorks Ingeo™ biopolymer is derived from an abundant 100% annually renewable plant resource.

Carbon is captured in these plant resources, sequestered from the atmosphere during plant photosynthesis and stored in the starch found in the grain of the plant.

Starch is then converted into natural sugars.

NatureWorks LLC uses these plant sugars, or dextrose, from a simple existing supply stream as their raw base material.

Through a process of fermentation, separation and polymerization, the carbon and other elements in these natural sugars are transformed to make Ingeo™.

Products

Ingeo™ biopolymer resin, available in a wide spectrum of grades, for use in plastics and fibers production.

Ingeo™ Innovations

Food serviceware

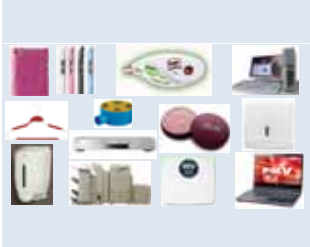
Films / Cards

Fresh food packaging

Bottles / Containers

Nonwovens / Fibres

Durables



Contact

NatureWorks LLC
PO Box 5528
1410 EA Naarden
The Netherlands

Phone: +31 (0)35 6945056
joanne_groen@
natureworkspla.com
www.natureworksllc.com

Contact Person

Joanne Groen

OMYA

Foundation
- 1884

Employees
- 7,000

Branches
- Industrial Minerals

Key Materials
- Calcium carbonate

Company

Omya is a leading global producer of industrial minerals, mainly fillers and pigments derived from calcium carbonate and dolomite, and also a worldwide distributor of chemical products.

The company's major markets are the paper, plastics, paint/coatings/adhesives industries as well as construction, environment, agriculture, food and pharma.

Founded in 1884 in Switzerland, Omya now has a global presence extending to more than 100 locations in over 50 countries with 7,000 employees.

Omya in Plastics

- Mineral modifiers such as calcium carbonate and dolomite produced by Omya significantly enhance processes and improve mechanical properties in numerous plastics applications.
- To meet the exacting demands of its customers, Omya emphasizes relevant advice and a wide selection of both mineral and chemical raw materials. Together, we discuss the desired property profile and look for a suitable combination of components, always with the objective of finding the best possible solution.
- Omya's length of experience and wealth of knowledge is a benefit for those who choose to work with us. Omya's technical support staff and technical facilities will help you find the optimal solution to suit your needs.
- We promote the use of calcium carbonate in both existing and new applications. Investigating new derivatives of calcium carbonate as well as processing technologies allow Omya to "push the boundaries" of existing application areas.
- As the largest global manufacturer of calcium carbonate, we have a vested interest to ensure that the message of **the benefits of calcium carbonate** is communicated to all stakeholders in the supply chain especially to the brandowners and retailing communities.

Sustainability in Plastics

Sustainable development is defined as a form of progress that meets present needs without compromising the ability of future generations to meet their needs. Quality, safety and corporate accountability are the principles upon which Omya conducts its business. For us sustainability includes:

Economic growth

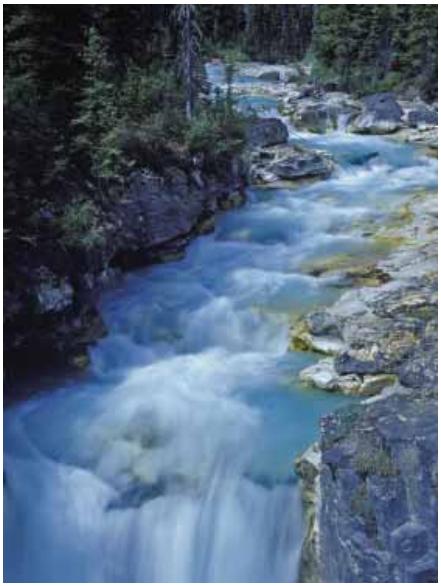
- Needs, rights and values of our customers
- Continuous improvement of our products and services

Ecological balance

- Compliance with applicable laws, rules and regulations and constant efforts to reduce our impact
- Environmental responsibility

Social progress

- Omya's facilities operate safely and are considerate of the community in which they operate
- We are good local citizens and respect our fellow human beings and the environment
- We are guided by ethical principles



Contact

Omya International AG
Basler Str. 42
4665 Oftringen
Switzerland

Phone: +41 (0)62 789 2929
plastics.info@omya.com
www.omya.com

POLYONE

The Company

- Global leader offering a comprehensive array of specialized polymer materials
- Tailored services
- End-to-end solutions
- More than 35,000 products

Turnover

- $ 2.1 billion (2009)

Employees

- More than 10,000 customers globally

Branches

- More than 60 manufacturing and distribution facilities in 20 countries
- Operations in North America, South America, Europe and Asia
- Joint ventures in North America
- Corporate headquarters in northeast Ohio (U.S.A.)

OnCap™ BIO Impact T

Transparent impact modifier for polylactic acid

Challenge Polylactic acid (PLA), although a relatively new polymer, has been specified for a broad and growing range of applications. It is embraced because it is based on renewable resources and appreciated for its extreme transparency and rigidity. However, for many applications, it is desirable to have improved impact properties.

Solution Typically, impact modifi ers are used to enhance impact resistance. While a range of impact resistant polymers are available for polylactic acid systems, the options are limited by the demand for retention of transparency. PolyOne has discovered a combination of additives and molecules used at the nano-scale that results in the desired increase in impact resistance while maintaining good transparency.

Value Provided The use of OnCapTM BIO Impact T increases STET impact resistance of PLA while maintaining its transparency.

- The increased toughness improves tear resistance. This makes the sheet easier to cut during fabrication and simplifi es handling and safety by reducing rough edges and uneven cuts. This also makes the sheet fi t for fi nal end use, helping improve consumer acceptance.
- Improved ductility also allows for holes to be punched in trays without tearing or shattering the tray itself. This results in increased production with less product failure as well as increased food safety.
- Reduced brittleness decreases the shattering of cups and trays during handling and packing, which lowers scrap rates and increases safety.
- Attractive, clear parts stand out on the shelf, helping improve consumer acceptance thereby increasing sales revenues and profits.

PolyOne

Looking for a Bio-Solution? Let PolyOne be your guide...

PolyOne's cutting-edge portfolio of sustainable solutions can help you meet today's challenges with renewable, recyclable, reusable, resource efficient, eco-friendly materials.

PolyOne

Implementation OnCap BIO Impact T is available as a compound, or in a solid or liquid concentrate, for use in PLA resin. Usage rates vary based on the effect desired. OnCap BIO Impact T can be used with other processing additives and can be combined with colorants into a single SmartbatchTM BIO concentrate.

Applications OnCap BIO Impact T can be used in a variety of plastics processing equipment, including extrusion, injection molding, blow molding and fi lm processing. Typical applications include food and beverage packaging, shopping and refuse bags, and consumer goods such as toys.

Contact

PolyOne Americas
33587 Walker Road
Avon Lake, Ohio 44012
USA

Phone: +1 440 930 1000
BioSolutions@polyone.com
www.polyone.com

POLYVLIES FRANZ BEYER GMBH & CO. KG

Foundation
- 1850

Turnover
- About 40 million €

Employees
- Over 250 employees

Branches
- Agriculture & Horticulture
- Automotive
- Building and Construction
- Consumer Goods
- Packaging

Key Materials
- Flax
- Hemp
- Kenaf
- Sisal
- Jute
- Wool
- Cotton

Key Products
- Naroplast®
- Narodur®

"Nonwovens for innovations. Innovations for nonwovens."
Polyvlies is an owner-managed medium-sized family company with over 250 employees.

Polyvlies produces and finishes technical nonwovens made out of synthetic and/or natural fibres. Because of incorporating the most modern technology Polyvlies is capable of producing technical textiles with a maximum working width of 6 metres and weights from 80 to 4,000 g/m².

The focus on customer orientation and joint application-specific developments has resulted in a range of more than 6,000 products that are produced from a number of different raw materials in an order-specific production procedure for various sectors (e.g. automotive, home textiles and geotextiles etc.)

In addition to the use of a wide variety of synthetic fibres, per example polypropylene and polyester, a further focus is the processing of renewable raw materials. Based on our years of experience in this sector, the respective production processes are continuously modified and the production capacities consistently expanded. Of the 15,000 t of fibres that are turned into nonwovens every year at Polyvlies, 5,000 t are already natural fibres. These include flax, hemp and kenaf, but sisal, jute, wool and cotton are also still used.

The customer groups and applications for these natural fibre products are wide-ranging (e.g. construction, furniture, agricultural, automotive industries etc.) The preliminary products or semi-finished products for natural fibre reinforced plastic composites make up the lion's share here. Primarily, they are used for thermoplastic and thermosetting compression moulding in the automotive industry.

Naroplast®

Naroplast is a thermoplastic natural fibre plastic composite whose benefits, such as high strength and impact resistance combined with a low weight, come to the fore after compression moulding. This means that it is especially suited to ideally satisfy the strict requirements of the vehicle manufacturing industry. Compared to conventional materials, the symbiotic combination of renewable raw materials and synthetic polymers plays an important role in conserving natural resources, storing CO_2, saving fuel, increasing passive safety and reducing noise levels. In addition, the matrix polymers can now also be replaced with low-emission materials without compromising performance.

Narodur®

Narodur is a thermosetting natural fibre plastic composite whose benefits, such as high strength and especially high stiffness combined with a relatively low weight, come to the fore after compression moulding. This means it is especially suited to ideally satisfy the very strict requirements made of carrier parts in the automotive, construction, shipbuilding or furniture industries. Here again, the symbiotic combination of renewable raw materials and synthetic polymers help to counter global warming, reduce noise emissions and contribute to passive safety. Depending on the application, customers have a choice of various matrix systems that can be supplied as pre-impregnated and ready for use in the pressing moulds.

Contact

Polyvlies
Franz Beyer GmbH & Co. KG
Rodder Str. 52
48477 Hörstel
Germany

Phone: +49 (0)5459 9310–0
Fax: +49 (0)5459 9310–50
info@polyvlies.de
www.polyvlies.de

Contact Persons

Herr Bruno Lüke
Automotive

Herr Martin Bolte
Non-Automotive

PROCOTEX CORPORATION

Foundation
- 1970

Turnover
- 29.5 million €

Employees
- 50

Branches
- 1

Key Materials
- Flax
- Textile waste

Key Products
- Hackled Flax
- Recycled natural/synthetic fibres

procotex SA CORPORATION NV

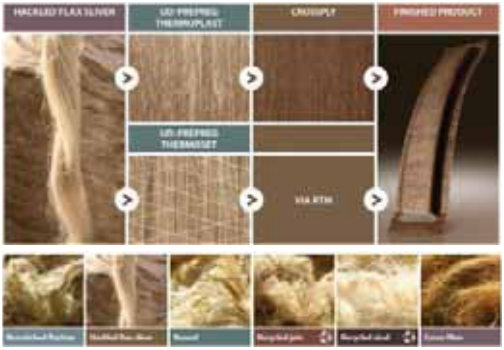
Company

Procotex is a Belgian company and has his roots in the flax industry. In 1970 the company started as a business enterprise specialized in the buying and selling of flax and its derivatives. They became specialized and well-known in the hackling of flax for the spinning industry. Because of globalization and competition, the decision was made to move this production unit to Lithuania, where they annually process 4000 ton of flax each year. This means that Procotex is, until today, one of the largest independent flax processing companies in the world.

Apart from being active in the flax industry, Procotex has been operating in the recycling market since 1979. This activity mainly consists of blending industrial textile waste, which through several processes is turned again into useful fibres for various industries. This production is organized in the Belgian facility. Procotex recycles all kinds of waste deriving from carpet-making, extrusion processes, mattress production, the felt industry, ready-to-wear clothing, charitable clothing collections, car interiors, etc. Additionally, they also recycle and source natural fibers such as coconut, kennaf, sisal and jute.

Nowadays, Procotex tries to enhance all its built-up knowledge from the flax and recycling industry to come up with innovative products in the market. The best example is their newly developed unidirectional flax composite material which combines nature with good mechanical properties.

Furthermore, the company has invested in a productive, flexible machine park, paying special attention to automation, balanced blending and environmental-friendly cleaning stations. Today, we have a capacity of 30,000 tonnes annually for the recycling of textile waste. Procotex recently expanded its capacity with a new pulling line offering the possibility of blending up to three or four different types of textile raw materials with staggered opening units, designed in-home. This installation opens up new horizons. What formerly had to be thrown out as textile waste can now be reconditioned to useful fibre.



procotex
SA CORPORATION NV

Material

One thing is sure, Belgium is well known for two famous industries:

1. It's the world centre of the highest standard quality linen fibres for more than 3.000 years. Procotex is geographically situated at the heart of the linen growning area, where it is active in:

- Trading of flax fibres for all industries all over the world: long scutched flax, rescutched tow and hackled tow for traditional textile industry, paper industry, automotive industry, etc...
- Producing of prepared flax fibres for the spinning industry, produced in the delocalised unit of Linolitas in Lithuania:
- Combed sliver for traditional half-wet flax spinning mills
- Combed sliver for the blending market (with PES, wool, etc...)
- Carded sliver
- Cotonised fibres for the blending market (with Coton, Rayon, etc...)

2. Belgium is the second biggest carpet producer in the world. Procotex is the innovative recycler company of all fiber wastes related to that industry such as PP, jute, PES, PA wastes... Besides that, Procotex is also serving the same carpet industry by helping it to sell its second-hand equipment and stocklot yarns.

Products

Procotex is a leading producer/exporter of flax fibers and synthetic/natural fibers. This means that the company has a very broad range of raw materials that can be suitable for your application.

Some examples:

- Synthetic: Polypropylene, polyester, polyamide,…
- Natural: Flax, jute, kennaf, coconut,…

These fibers can be long or cut on very short length (1 mm) and be used in, for example, the plastic industry.

Longer fibers are mostly used in non-wovens, drainage, automotive, re-granulation,…

Furthermore, Procotex is using its great knowledge of hackling long flax fibers for the production of unidirectional prepregs in flax aimed at the high end composite industry. These UD prepregs have exceptional characteristics such as: green by nature, renewable material, high strength and stiffness, light weight/weight savings, low density, high vibration absorption, good thermal and acoustical isolation. To resume: Materials for a low carbon future. These prepregs are developed with a thermosetting as well as a thermoplastic matrix.

Contact

Procotex Corporation
Rue Theodor Klüber 8
7711 Dottignies
Belgium

Phone: +32 (0)56 483 888
info@procotex.com
www.procotex.com

Contact Person

Matthias Hoornaert
m.hoornaert@procotex.com

PROGANIC GMBH & CO. KG

Trademark

- PROGANIC® is a registered trademark of Proganic GmbH & Co. KG since January 2009. It is available under license directly through the German headquarter in Munich.

General description

- PROGANIC® is a bio-polymer – fully biodegradable and CO_2 neutral.

Key components

- PHA (Polyhdyroxalkanoate), PLA, plant wax and minerals

Products on the market

- Biodegradable plastic products for the daily use

Each item carries the PROGANIC® quality seal of approval.

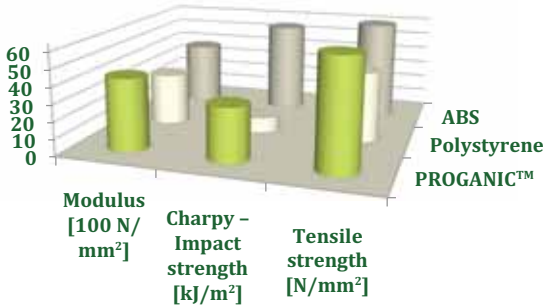
Material

PROGANIC® is made from 100%, renewable material and minerals. It looks, feels and works just like plastic but is organic and can be easily reintroduced into the earth's natural cycle by composting. It is a major contribution in preserving the earths natural resources and significantly lessens the environmental impact through waste avoidance.

Composition

- PHA – Polyhdyroxalkanoate
- PLA
- PLANT WAX – we use the hardest known natural wax derived from the Carnauba palm leaves. It is harmless to health and is fragrance free.
- MINERAL – we use a natural mineral as filler (bulking agent) which has water repellent and sealing properties.
- COLORS – We supply anorganic color pigments to all our PROGANIC® customers.

PROGANIC® in comparison to commonly used plastic



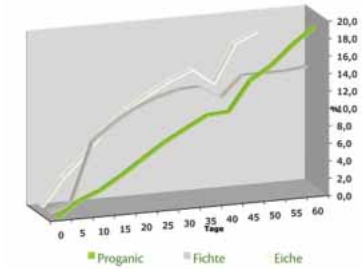
Award In 2010 PROGANIC® was awarded the bio material of the year 2010 by the renowned nova-Institute.

Customers Since 2010 brands like PROPPER and RIVAL produce household and gardening products made of PROGANIC®. The range varies from watering cans, flower pots, adhesive hooks to brushes and kitchen tools. PROGANIC® products are available in big store chains such as Müller, Bauhaus and OBI in Germany as well as major retailers internationally.

Corporate Identity PROGANIC® is a strong brand with a clear marketing strategy. A remarkable logo and a claim that reflects the environmental aspect will ensure awareness and differentiation in the fast growing market of sustainable and bio-responsible products. We support our manufacturers with complete advertising packages and communication measures for their point of sale.

Applications

PROGANIC® is degradable and compostable according to the requirements of DIN-ISO 14851/14852.



Furthermore PROGANIC® meets the stringent EG No. 1935/2004 regulations for materials considered harmless when in contact with food and beverages, as well as the Code of Federal Regulations, Food and Drugs (FDA) 21 CFR Ch1, 177,1660. In addition it fulfills the requirements of the DIN EN of 71 parts 3 safety for toys, migration of certain elements with respect to heavy metals. Therefore it is an ideal replacement for traditional plastics and can be used for all types of consumer articles predestined to come in contact with food and beverages. Furthermore, it is suitable for all types of articles for daily use such as flower pots, watering cans, containers, trays, as well as for all disposables and food packaging.

Advantages

PROGANIC® is completely natural and made from 100% renewable materials and minerals with the same hardwearing and versatile uses as plastic without harming the earth. It is residue-free, bio-degradable and more importantly CO_2 neutral.

- made from 100% natural materials and minerals
- fully biodegradable
- heat stable up to 100 °C
- dishwasher safe
- food safe
- water resistant and repellent
- hard wearing and resilient

PROGANIC® and the Future Our vision is to replace conventional plastic with PROGANIC® as much as possible. We invite other plastic manufacturers to join us and become a PROGANIC® manufacturer. Our aim is to establish PROGANIC® clearly against other “bio-plastics”, which are often a mix of chemicals and bio-polymers. PROGANIC® is 100% natural; our quality seal confirms this on every product. PROGANIC® is our contribution to a sustainable way of life and the preservation of the earth’s natural balance.

Contact

Proganic® GmbH & Co. KG
Balanstr. 73 / Haus 9
81541 Munich
Germany

Phone: +49 (0)89 3580 50 – 452
Fax: + 49 (0)89 3580 50 – 455
info@proganic.de
zuberi@proganic.de
www.proganic.de

PURAC

Foundation
- 1930

Turnover
- 355 million € (2009)

Employees
- 1,100

Branches
- Purac Biochem (The Netherlands)
- Purac Bioquímica (Spain)
- Purac France
- Purac Poland
- Purac Russia
- Purac America
- Purac Mexico
- Purac Sínteses (Brasil)
- Purac Asia Pacific
- Purac China
- Purac Korea
- Purac Thailand
- Purac Japan

Key Materials
- Beet sugar
- Cane sugar
- Tapioca starch
- Corn starch

Key Products
- L-Lactic Acid
- D-Lactic Acid
- L-Lactide
- D-Lactide

purac
pure by nature

Company

Purac is a leading company in Lactic Acid based bioplastics and the worldwide market leader in Lactic Acid, Lactic Acid derivatives and Lactides. Purac develops the bioplastics market through innovative solutions and partnerships with a select group of companies in the plastics value chain. Purac has 80 years of experience in the development, manufacturing and marketing of these products in a broad range of industries. Purac operates production plants in the USA, the Netherlands, Spain, Brazil and Thailand and markets its products through a worldwide network of sales offices and distributors.

Purac is headquartered in The Netherlands and is a part of CSM. CSM operates in business-to-business markets throughout Europe, North America, South America, and Asia, generates annual sales of EUR 2.6 billion (2009) and has a workforce of around 8,450 employees in 25 countries. CSM is listed on the NYSE Euronext Amsterdam.

Purac is active in a variety of markets, with a focus on natural food ingredients and bio-based chemicals including Lactide monomers for Poly Lactic Acid (PLA).

L-Lactide and D-Lactide monomers for PLA PURALACT L® and PURALACT D® are Purac's monomers for the bioplastics industry. Lactides, are dimers of Lactic Acid and so called building blocks for polymers and the production of other chemicals. There are two types of Lactides available: D-Lactide and L-Lactide. Purac's Lactides are characterized by its high purity which is a great technological and economic advantage during further processing into lactic acid based bioplastics.

The earliest and best know use of lactic acid as a building block is the use as a monomer for the production of PLA. However, Purac has also performed extensive research on other uses of Lactic Acid and its derivatives, such as in thermoset resins.

Heat-resistant PLA Combinations of L-Lactide and D-Lactide can be used as a solution to create PLA co-polymers or block-co-polymers with a range of features. The availability of pure D-Lactide also offers

the possibility for further development of second generation PLA which is based on stereo-complex technology. This technology offers the unique possibility to increase the heatstability of PLA from 70 up to 230 degrees Celsius. D-Lactide can be used to develop a range of heat-resistant PLA products for plastics, films, fibers and foam applications. L-Lactide and D-Lactide, together with an associated polymerization technology, enable our partners to produce a wide range of PLA products in an economic way.

Industrial production of Lactide monomers for PLA Purac is currently constructing its new Lactide plant in Thailand. The investment is driven by CSM's commitment to play a leading role in the development of the market for Lactic Acid based bioplastics. The investment for this new 75,000 tons Lactide plant will be EUR 45 million. The new plant will be ready for start up in the second half of 2011. The plant is designed to produce both L-Lactides and D-Lactides, made out of L- or D-Lactic Acid sourced from existing Purac plants.

Innovating in sustainability To keep on innovating is our passion. New products, new processes, new applications, new markets, improved product quality and production efficiency have always been important reasons for our continuous innovation efforts. Now, sustainability and a reduced carbon footprint have joined this list and become increasingly important drivers for Purac's innovation programs. Key topics in the sustainability program are: alternative (non-food) feedstock materials, minimizing the use of auxiliary chemicals, reduction of the energy use, increased use of green energy and replenishment of nutrients into agricultural soil.

www.purac.com/bioplastics

pure by nature

Contact

Purac
PO Box 21
Gorinchem 4200 AA
The Netherlands

Phone: +31 (0)183 695 695
info@purac.com
www.purac.com

Contact Person

Hans van der Pol

RAMPF GIESSHARZ GMBH & CO. KG

Foundation
- 1980

Branches
- Automotive Industry
- Electronic / Electrical Industry
- Household Equipment
- Plastics Industry
- Furniture Industry
- Polishing Material Industry
- Solar Energy

Key Materials
- Polyurethane
- Epoxy resins
- Silicones
- Bio polyol based products from renewable raw materials

Key Products
- Foam gaskets
- Electro casting resins
- Casting resins
- Adhesives
- Edge casting resins
- Spray moulding

RAMPF is researching intensely into renewable raw materials.

RAMPF discover the future

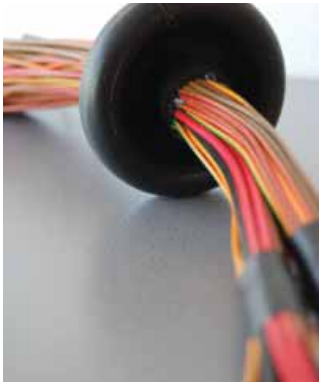
Company

RAMPF Giessharze GmbH & Co. KG based in Grafenberg continues to prepare for the future. By the year 2013, the plastics specialist aims to manufacture the majority of its materials from renewable sources. The first products based on bio polyols are already being marketed with the support of sister company RAMPF Ecosystems GmbH & Co. KG.
Furniture, fuels, cosmetics – a whole raft of diverse products are already manufactured using renewable raw materials, and R&D efforts are focused on the search for further breakthroughs. Over recent years, development work has enabled polyols from renewable raw materials to be used in the manufacture of polyurethane (PUR). RAMPF Giessharze, which specializes in PUR and epoxy resin systems as well as silicone, has set itself the target of manufacturing more bio polyol-based products. “Saving resources is the order of the day. In every key sector. The challenge we face is to develop products which are both economically and ecologically viable”, explains Dr. Klaus Schamel, CEO of RAMPF Giessharze. The company, which produces foam gaskets, electro casting resins, adhesives and casting systems, is facing the challenge with the support of a strong partner: Its sister company RAMPF Ecosystems. Working together, they have developed two special casting compounds made of rapeseed oil, whose uses include the charging plugs of electric vehicles. Both companies are part of the international RAMPF Group from Grafenberg. With a workforce of around 410 and a planned turnover of 85 million Euro for the 2010/2011 financial year, the company group is among the leading names in the reaction casting resin and machine system sector. RAMPF has secured its market presence with a total of five operative companies, all united under the umbrella of a holding company. With its primary export markets in Europe and Asia, as well as the NAFTA region, RAMPF also maintains its own agencies in the USA, Japan and China.

Recycling capacity set to double in the future One business division, RAMPF Ecosystems based in Pirmasens, is dedicated exclusively to the recycling of polyurethane and research into renewable raw materials such as rapeseed oil, lactose, grease and glycerine.
RAMPF Ecosystems does not class polyurethane production residues and “post-consumer” PET from packaging (green dot) as waste, but as a valuable recycling resource. Using special chemical processes such as glycolysis, acidolysis or polyolysis, these are processed to create (recycling) polyols. Known as recypoles and petoles, these are fed back into the polyurethane manufacturing process. Its customers include not only the companies of the RAMPF Group but also other system suppliers. RAMPF has developed a thermal glycolysis plant for the recycling process which is currently among the biggest of its type in Europe. An additional plant is due to be commissioned in the spring of 2011 in the company’s Pirmasens location. This is due in large part to the rise in demand for bio-polyols. This will double the annual capacity of the recycling specialist to around 5,000 tons.
Alongside the production of shaped components such as headrests and gear knobs, RAMPF Ecosystems also provides a plant construction serv-

ice directly on its customers' premises. With this service, it closes the loop between PUR processing, waste material recycling and repeated use of the produced polyols.

Cable grommets and plugs for electric vehicles made of rapeseed oil To extend the application spectrum of renewable raw materials in polyurethane plastic production, RAMPF Ecosystems has concentrated specifically since 1999 on the modification and functionalization of renewable raw materials. It is particularly keen to use domestically produced plant oils such as rapeseed oil, which is sourced locally from an oil mill located in the vicinity.
The benefits of bio-polyols for manufacturers and customers alike do not require complex explanation. Long-term availability, carbon neutrality and improved product characteristics make bio plastics a competitor to be reckoned with for conventional materials. "Compared to a petrochemical-based polyurethane, the emission of greenhouse gases can be reduced by 30%. There is also scope for improved functionality," emphasizes Michael Kugler, Operations Manager at RAMPF Ecosystems. Sugar derivatives, for instance, demonstrate high functionality levels which result in improved cross-linking in the subsequently produced polyurethane, and in better mechanical foam characteristics when producing hard foams. Plant oil-based polyols, or rather the relevant fatty acids, have a pronounced hydrophobic character, making them a popular option in hydrolysis-stable polyurethanes. The first rapeseed and soya oil-based products to be manufactured by RAMPF Giessharze and RAMPF Ecosystems are the proof. Only recently, an efficient encapsulating compound was launched in the marketplace which is used as a protective sleeve in cable grommets for trucks. The mechanical strength and outstanding vibration, noise and thermal insulation properties of the hard foam product manufactured from rapeseed oil are impressive. The experts have also developed an electro casting resin made of bio-polyols which is used for instance in the charging plugs of electric vehicles. The material is able to compensate for extreme differences in temperature, but provides protection against overheating, impacts and chemicals.



Rapeseed oil used to produce bio-polyols from RAMPF is recovered from locally grown plants. © Sophia Winters – Fotolia.com

Left: The cable grommet made of bio plastic contains rapeseed oil, making it particularly hydrolysis-stable.

Right: Electro casting resins from RAMPF made of bio-polyols are used in the charging plugs of electrical vehicles. © queonda – Fotolia.com

Contact

RAMPF Giessharz GmbH & Co. KG
Robert-Bosch Str. 8–10
72661 Grafenberg
Germany

Phone: +49 (0)7123 9342–0
Fax: +49 (0)7123 9342–2444
info@rampf-giessharz.de
www.rampf-giessharz.de

Contact Person

Ulrike Jäger
RAMPF Holding GmbH & Co. KG
Albstr. 37
72661 Grafenberg
Germany

Phone: +49 (0)7123 9342–1045
Fax: +49 (0)7123 9342–2045
ulrike.jaeger@rampf-holding.de

JRS
J. RETTENMAIER & SÖHNE GMBH + CO KG

J. RETTENMAIER & SÖHNE GMBH+CO.KG JRS Fasern aus der Natur

Company

JRS balances nature and plastics and has been a fixture for fibrous materials in the plastics industry for decades

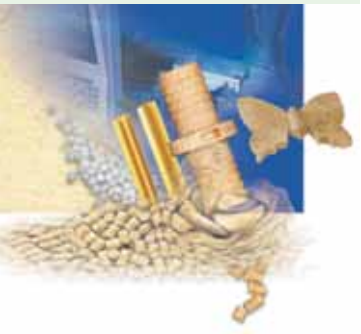
Today, renewable natural-based materials have gained a hold in all areas of modern industry. Featuring extensive expertise and technological know-how in the use of plant fibre, Rettenmaier & Söhne sees its role as a mediator between the world of plastics and the wealth of ideas offered by nature – and that applies for all areas of the plastics industry.

Product overview

Innovative technology for wood extrusion WPC applications are made economically using JRS fibre, compounds and pellets. Optimised and surface-modified ARBOCEL® and LIGNOCEL® wood fibres offer excellent process reliability in both direct extrusion and the compounding for PVC, PP and PE plastics as well as bioplastics.

Cost-effective solutions from a single source Customer-specific extrusion pellets, individually blended with polymers and wood fibres, are the economical base material for your end products. Process development, optimised logistics and extrusion services characterise the successful collaboration between JRS and customers, for a distinct market edge.

Interesting potential offered by wood injection moulding New ideas and products characterise this young market. The wood-like touch and environment-conscious marketing outweigh the technical features. LIGNOCEL® compound, with a wood composition of 65–70%, offers a solid basis for the winning of new markets.



Cellulose fibre
Wood fibre
Paper fibre
Grain fibre
Pellets
Compounds

– low dust
– free-flowing
– simple processing
– fast extruding

J. RETTENMAIER & SÖHNE GMBH+CO.KG JRS Fasern aus der Natur

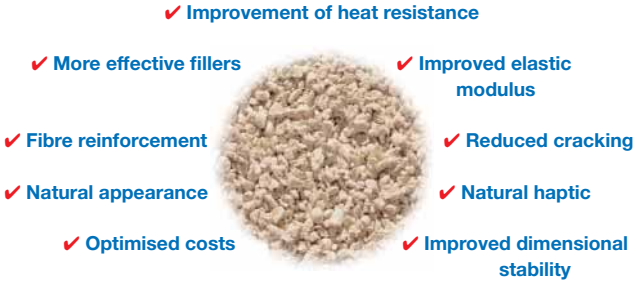
We make the “W” in WPC and much more

Ideally balanced fibre and plastics JRS fibre products offer a broad spectrum of function and uses. Properly applied and balanced with efficiency and sustained economy. That makes our “quiet stars” from nature’s building box so successful. Use this enormous potential for your products and processing. “Green ideas” applied practically and environment-friendly.

JRS – the research and development partner JRS’ research and practical know-how are in demand throughout the world. JRS maintains three R&D facilities in Europe, the USA and Asia, building a bridge between many years of experience in the area of fibre application and innovative product development or efficiency-building optimisation of applications. Always near to the actual practice and in close contact with the customer. Use this as a basis for new inspiration and to your technical advantage. In theory and practice!

JRS facts and figures at a glance

- Over 1,600 employees throughout the world
- 18 plants in Europe, the USA and India
- Company-operated sales, consulting and logistic centres in all the relevant countries
- 3 research and development facilities in Europe, the USA and India
- Cooperation with reputable universities and institute



Contact

J. Rettenmaier & Söhne GmbH + Co KG
Holzmühle 1
73494 Rosenberg
Germany

Phone: +49 (0)7967 152 680
Fax: +49 (0)7967 152 500 680
info@jrs.de
www.jrs.de

Contact Person

Dr. Andreas Weiss
andreas.weiss@jrs.de

Andreas Kampf
andreas.kampf@jrs.de

ROQUETTE

Foundation
- Family-owned French group founded in 1933
- International activity in conversion of renewable agriculture raw materials into starch and starch derivatives
- One of the four world leaders in starch industry

Turnover
- 2.3 billion €
- Industrial sales and agent locations in more than 120 countries

Employees
- More than 6,400 people worldwide

Branches
- Products for 5 major applications fields: human nutrition, paper and cardboard, pharmaceuticals and cosmetics, chemistry and bio-industry, animal nutrition

Key Materials
- Raw materials: wheat, corn, potatoes and peas

Key Products
- A range of more than 700 products
- Global world leader for polyols (sorbitol, mannitol, maltitol and xylitol)
- One of the world leader in modified starches and proteins

ROQUETTE *Offering the best of nature™*

Company

ROQUETTE is a family-owned French group founded in 1933 that is active internationally in the conversion of renewable agriculture raw materials (wheat, corn, potatoes and peas) into starch and starch derivatives.

With 2.3 billion euros in revenue and industrial, sales and agent locations in more than 120 countries, ROQUETTE is one of the four world leaders in starch industry.

ROQUETTE employs more than 6,400 people worldwide, more than two-thirds of them in Europe and has production units in France, Italy, Great Britain, Germany, Romania, the USA, China, India and South Korea.

ROQUETTE manufactures more than 700 products used in five major applications fields: human nutrition, paper and cardboard, pharmaceuticals and cosmetics, chemistry and bio-industry, animal nutrition.

The Group's development is focused on the health nutrition, vegetal-based building blocks for chemistry and more recently in plant-based resins for converters and compounders

Gaïalene® *Plant-based Resins by Roquette*

Material

Based on 75 years of expertise in starch transformation and the synthesis of its derivatives, ROQUETTE has conceived for converters and compounders, GAÏALENE®, a new range of plant-based resins.

GAÏALENE® plant-based resins are thermoplastic products obtained by a patented hemi-synthesis process by grafting starch. This gives them original properties.

GAÏALENE® resins are:
- **BIO-BASED:** over 50% plant based materials,
- **PERFORMANT:** displaying specific characteristics such as a soft touch, high shock resistance, natural antistatic properties, high resistance to blush, easy colouring and compounding properties.

ROQUETTE

- **SUSTAINABLE** and opening new horizons in plastics applications like packaging (bottles, film wrap, etc.), household appliances, automobile industry, interior design and more,
- **PROCESSABLE** on existing lines, but at a lower temperature than traditional plastics (about 170°C) inducing lower energy consumption.
- **COST/EFFECTIVE:** plant-based alternatives to common polyolefins, ABS or more technical polymers, for **DURABLE** applications
- **LOW CARBON FOOTPRINT:** CO_2 emission reduced by at least 40% compared to polyolefins
- and fully **RECYCLABLE**.

Moreover GAÏALENE® resins also fulfill heavy metals and REACH regulations and can be used for food packaging. They are free of genetically modified organisms.

Typical applications of GAÏALENE® resins grades are
- blow film extrusion,
- injection moulding,
- extrusion blow moulding
- and compounding,

R&D in Partnership with Customers In his main Research and Development Center in Lestrem (France), ROQUETTE employs about 300 researchers and technicians and works alongside its customers in complete confidentiality to develop new expertises and formulate solutions that meet their specific requirements. This represents for them significant savings in terms of time and money, providing with GAÄLENE® resins a competitive edge in their markets where consumers are increasingly demanding and sensitive to sustainable development in their everyday environment.

Contact

ROQUETTE
62080 Lestrem
France
Phone: +33 (0)321 633 600
www.gaialene.com
www.roquette.com

Contact Person

Michel Serpelloni
gaiahub@roquette.com

SONAE INDÚSTRIA, SGPS, SA

Turnover

- A leader in wood technology
- Over 7 million tons of wood processed annually
- 28 plants
- 1.3 billion €

Employees

- 5,000

SONAE INDUSTRIA

WoodForce
A REVOLUTIONARY POLYMER REINFORCER

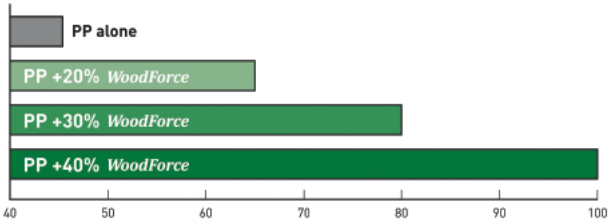
The Material

Sonae Industria, a leader in the wood industry, introduces WoodForce: a new & renewable raw material designed to reinforce polymers. Based on new patented technology, WoodForce is an easy-dosing product, meeting all of the industrial efficiency objectives of the polymer compounding industry. With WoodForce, compounders meet sustainable development demand from their customers while maintaining product performance, industrial efficiency, profitability and competitiveness.

Superior Product Performance

- WoodForce fiber provides excellent **reinforcement** properties, comparable to those of standard glass fiber, other natural fibers, and much better than those obtained with wood flour.
- WoodForce is compatible with most blends of polymers.
- WoodForce is designed for **optimal dispersion** within the matrix.
- Independent research institutes & industrial partners have **validated** the excellent polymer reinforcement properties of WoodForce.

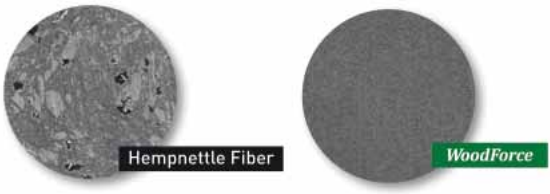
Tensile Strength (%)



Proven Performance With Injection Technology

The Le Creusot plant in France

Perfect Dispersion Within the Matrix
(Microscopic imaging)



The NEW Power of Nature

- WoodForce is made of a renewable material & is recyclable.
- WoodForce helps the environment: trees capture CO_2 from the atmosphere and sequester it.
- WoodForce uses wood fibre locally sourced from certified forests (International FSC and European PEFC programs).
- WoodForce manufacturing consumes little energy relative to glass fibre manufacturing.

The Industrial Performance

- WoodForce is softer on injection equipment: guaranteed longer life compared to using glass fibre.
- WoodForce is easier to dose than any other fibre.
- WoodForce comes ready to use, with constant properties, and as a homogeneous product.
- WoodForce is not dependent on seasonal production as wood is harvested all year long.
- WoodForce manufacturing capacity is in place as it relies on existing & compatible manufacturing processes.
- WoodForce creates no health & safety hazard in your plant.

Find out more at www.WoodForce.com

PEFC

FSC

Contact

Sonae Indústria, SGPS, SA
c/o ISOROY PARC D'AFFAIRES SILIC 54
Rue d'Arcueil BP 50135
94523 Rungis Cedex
France

Phone: +33 (0)156 302 000
Fax: +33 (0)157 021 271
christophe.chambonnet@sonaeindustria.com
www.sonaeindustria.com

Contact Person

Christophe Chambonnet

STRUKTOL COMPANY OF AMERICA

Foundation

- To provide processing solutions using unique combinations of chemistries

Employees

- 100+

Branches

- Global representation through agents and distributors

Key Products

- Lubricants and processing additives for the plastics and rubber industries

Company

Struktol Company of America is a member of the Schill & Seilacher family of companies, with representation in over 100 countries around the world. A global organization with over a century of specialty chemical expertise, Schill & Seilacher markets most of their polymer processing products under the brand name STRUKTOL® – a name that has become synonymous with both quality and performance. Struktol Company of America manufactures chemicals for the plastics and rubber industry, Wood Plastic Composites, foam inhibitors, polydispersions, silicone emulsions and products used in latex processing.

When it comes to plastics additives, Struktol's vast chemical experience is translated into the most intelligent solutions available anywhere. Each of Struktol's plastic additives is tested and retested to insure maximum product quality and performance consistency. And Struktol continually invests in extensive plastic additives research and development, resulting in reductions in the total number of additives required for many compounds. This persistent research into changing and improving the processing and performance characteristics of compounds and resins will open many new windows of opportunity for the future. Struktol's complete line of additives that function individually or in combination as adhesives, lubricants and surfactants are all accompanied by a wide range of benefits. Struktol offers lubricants and processing additives for all major polymers including PE, PP, PVC, ABS, PC, Nylon and other polymer systems. These additives are particularly useful in highly filled systems where good flow, good surface and properties are difficult to obtain.

Struktol's additives are particularly useful in Wood Plastic Composites (WPC). WPC processing additives are available for all types of WPC polymer systems and requirements. Struktol engineered additives for WPC

provide improved filler dispersion, lower viscosities, improved surface appearance, reduced edge-tearing, significantly increased output rates and overall lower costs. The newest line of products, our TPW series, has been specifically designed for compounding wood-composites under a variety of different conditions.

The Struktol approach is by no means typical or ordinary. Chemistry is at the heart of everything we do. Providing Intelligent Additives Solutions, Struktol products are designed to meet the challenges and exacting demands of our customers. Our technical specialist, R&D chemists and compound laboratory are dedicated to creating innovative solutions for the ever-changing polymer industry – solutions that keep you ahead of your competition with increased productivity, better quality parts and lower overall cost. In addition to premium product performance, Struktol Customer Service initiatives have become the industry benchmark.

Our sales and technical staff are your introduction to Struktol Intelligent Additive Solutions. We are the industry's most knowledgeable plastics additive experts. Our people are responsible for initiating the valuation of your compound or processing problem. Once we have gathered the appropriate information and data on a particular customer compound, a preliminary analysis will identify opportunities for improving compound performance.

The technical capabilities at Struktol are unequalled anywhere in the world. ISO 9001 certification means that everyone at Struktol is focused on product quality. From the lab through manufacturing and shipping, the entire process is governed by the desire to produce the highest quality products. But today, outstanding product quality and performance is not enough. Every customer is somehow unique and often requires custom solutions. Struktol is dedicated to providing solutions as the industry evolves.

Please visit our website at www.struktol.com for a full listing of our products and to find our sales representative in your area. Struktol is represented in most European countries by VELOX GmbH, Germany, phone: +49 (40) 369–6880, email: info@velox.com.

Products

Struktol offers lubricants and processing additives for all major polymers including:	
ABS	Polyolefins
Nylon	PP
PC	PVC
PE	Wood Plastics Composites

Contact

Struktol Company of America
201 E. Steels Corners Road
P.O. Box 1649
44224–0649 Stow, Ohio
USA

Phone: (330) 928–5188
customerservice@struktol.com
www.struktol.com

Contact Person

Juan Bravo
International Technical Manager, Plastics

TECHNAMATION TECHNICAL EUROPE GMBH

Foundation
- 2002, Aachen, Germany

Turnover
- 238,000 € (2008)

Employees
- 5

Branches
- WPC Extrusion & Injection Moulding
- R&D in WPC

Key Materials
- Wood
- Bamboo
- Hemp
- Rice husks
- Polymers and others

Key Products
- Compounds and granulate, panels, deckings
- Product design to fit customer needs
- Tests for suiting new products to machine design
- Tool design
- Installation of WPC production lines (in co-operation with a German WPC machine producer)

Company

TECHNAMATION Technical Europe GmbH's activities mainly include WPC (Wood Plastic Composites) processing and its various derivatives. By its orientation and philosophy the company stands for the harmony between ecology and economy. Since the founding of the company in the year 2002, TECHNAMATION has mainly been conducting R&D in environmentally friendly product design which includes natural fibre and polymer reprocessing. During this time TECHNAMATION has been able to establish itself as one of the leading specialists for an extensive range of extrusion and injection type WPC products. As of now, TECHNAMATION is capable of offering the complete production cycle from saw dust, via granulate to finished extrusion and injection products. This includes the supply of tools/moulds and extrusion machines (the latter via a German partner company).

TECHNAMATION conducts marketing studies for its own aims which can be offered to interested customers.

Further, product quality and endurance certifications are provided by a Technical University in Germany.

These combinations and close partnerships raise TECHNAMATION to a leading position in this upcoming field of sustainable product markets.

Material

The development of techniques and machines in order to process WPC is an essential part of the business of TECHNAMATION. The consistent research and development carried out over the years, which has led to the company's advantageous competitive edge, has resulted in a variety of patents and made it possible for TECHNAMATION to manufacture WPC-Products with a percentage of natural fibres of up to 90%. In tests, the company has even reached a percentage of 100% natural fibres. These fibres can be gained from raw materials such as bamboo, wood, hemp and sisal. Also coffe shells (cisco) and rice husks can be used for the production of WPC. Hence TECHNAMATION is in the avant-garde of finding new ways of promoting sustainability by superseding polymers or enhancing its varied applications.

Products

Final products of TECHNAMATION include typical extrusion output in the form of profiles, deckings, furniture parts, thin sheet material for special surface applications, as well as injection material like floor tiles, garden click and use elements and oriental screen designs. Their use is geared both for external and internal fittings. TECHNAMATION also particularly wants to serve the growing granulate demand both for extrusion and injection, bearing in mind that the market trend clearly points in the direction of increasing percentages of natural fibres. This mainly meets conditions whereby typical plastics producers want to augment their traditional pro-

duct ranges in order to diversify into the WPC market niche. This creates opportunities for TECHNAMATION to supply granulate and know-how for assisting in this way.

Continued R&D ensures an important market impact in the field of bio-polymers by cooperating with major players in this field of biodegradable products.

Contact

TECHNAMATION
Technical Europe GmbH
Forster Str. 65
03172 Guben
Germany

Phone: +49 (0)3561 68 577 – 0
info@technamation.com
www.technamation.com

Contact Persons

Bashar Idilbi
Technical Director
b.idilbi@technamation.com

Patricia Idilbi
technamation@technamation.com

Gerd Rebler
grdrebler@technamation.com

TECNARO GMBH

Foundation
- 1998

Employees
- 20

Branches
- Compounding
- Bio-based and biodegradable materials e.g. for toys, automotive, furniture, electronics, music instruments, packaging, office, building and construction industries as well as in funeral business, agriculture and forestry

Key Materials
- Bio-composites and blends: ARBOFORM®, ARBOFILL®, ARBOBLEND®

Key Products
- Biomaterials for moulded parts, semi-finished product, sheets, films, profiles, etc.
- Sheets, e.g. for thermoforming

Company

Founded in 1998, TECNARO GmbH develops, produces and markets bio-based and biodegradable materials. The business is focused on three different material families: Liquid Wood ARBOFORM®, Wood Plastic Composites ARBOFILL® and Biopolymer Compound ARBOBLEND®.

Tecnaro received several awards for innovation, sustainability and in the category supplier: European Inventor Award 2010, German Industry Award 2009, Werkbund label 2008, Innovation Award of VR Bank 2007, Golden Euromold Award 2000, etc. and contributed in numerous national and international research projects regarding material development based on natural resources.

Together with Fraunhofer, Tecnaro holds several patents in this field.

ARBOFORM®, ARBOBLEND® and ARBOFILL® can be processed by injection moulding, extrusion, calendering, blow molding, thermoforming or pressing into moulded parts, semi-finished product, sheets, films or profiles.

Today's series applications can be found in toys, automotive, furniture, electronics, music instruments, packaging, office, building and construction industries as well as in funeral business, agriculture and forestry.

Bavarian State Forestry and Jochen Rümmelein: Forest signs made from thermoformable ARBOBLEND®.

Fujitsu, Leader in Green IT and Amper-Plastik: Palm rest of Eco-keypad made from ARBOFORM®.

Sergio Rossi / Gucci Group: Eco Pump made from ARBOFORM®. Picture: Fabian Diehr.

IMM: Loudspeakers made from ARBOFORM®.

Extruded decking profile made from ARBOFILL®.

COZA Bios line: Household series made from ARBOFILL® with FDA approval.

ARBOFORM®

- ARBOFORM® is based on the renewable raw material lignin which is available in huge quantities.
- ARBOFORM® is unique and protected by international patents.
- ARBOFORM® is sustainable, independent from crude oil, reduces environmental impacts and offers new markets for agriculture and forestry business.
- ARBOFORM® combines two big industrial sectors: Wood industry can provide three dimensional parts in an economic way and plastics processors can substitute their materials by an ecological alternative.

Said shortly: ARBOFORM® is “liquid wood”

edding 24 highlighter: Cap and barrel made from ARBOFILL® with 70% renewable resources.

ARBOFILL®

The compounds are made from plastics and natural fibers. This combination offers sustainable and aesthetical materials with good mechanical and thermal properties at very competitive costs.

ARBOBLEND®

- ARBOBLEND® is 100% biodegradable and has similar mechanical properties like e.g. ABS.
- ARBOBLEND® consists – depending on the grade – of biopolymers like the wood constituent lignin or of lignin derivatives and/or other biopolymers like polylactic acid, polyhydroxyalkanoates, starch, natural resins and waxes, cellulose, additives and natural fibers.

Additional information can be obtained from the TECNARO-Team.

Filaments as well as thermoformable films and sheets made from ARBOBLEND®.

Contact

TECNARO GmbH
Burgweg 5
74360 Ilsfeld-Auenstein
Germany

Phone: +49 (0)7062 9178902
Fax: +49 (0)7062 9178908
info@tecnaro.de
www.tecnaro.de

Contact Persons

Jürgen Pfitzer Helmut Nägele

TEREOS SYRAL

Foundation
- Marckolsheim plant (FR), started in 1993. It became the headquarters in 2007 after the acquisition of 5 European starch plants.

Turnover
- 1.2 billion €

Employees
- 1,200

Branches
- Tereos-Syral is the cereal activity of Tereos, a global player in sugar, starch and alcohol

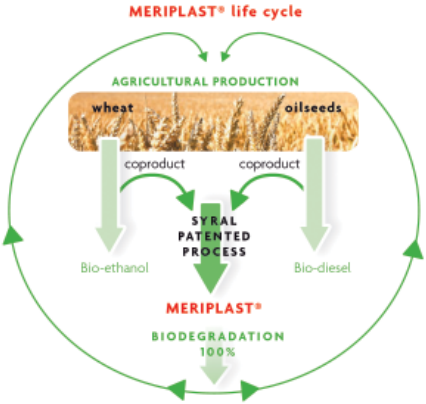
Key Materials
- Wheat and corn

Key Products
- Starch and derivatives (glucose, maltodextrins, polyols …)
- Vegetable proteins
- Alcohol and bio-ethanol

Company

Tereos Syral is the 3rd European starch producer and transforms in its 6 plants 3 million tons of wheat and corn into starches and derivatives, vegetable proteins, alcohol and bio-ethanol. These products are used in human and animal nutrition, pharmaceuticals and personal care, paper and corrugated board, chemistry, plastics and bio-fuels.
Tereos Syral is a subsidiary of the French cooperative group Tereos, whose activity is based on sugar beet, sugar cane and cereals processing. Tereos is a leader of bioethanol production in Europe, and intends to pursue its diversification in green chemistry, notably by developing 2nd generation processes.

Our bio-materials today:
- Native and modified starches: for paper, board, plaster boards
- Glucose: for green binders, tensioactives, concrete additives
- Polyols: for polyurethan, adhesives, surfactants, concrete additives
- Ethanol: for biofuels, fine chemistry
- Proteins: for biodegradable plastics



Material

Tereos Syral has developed Meriplast®, a novel flexible and elastic bioplastic. Meriplast® is entirely made from raw materials derived from agriculture and is fully biodegradable. Its specific flexibility and elasticity properties make it unique amongst other currently available biomaterials. Meriplast® can be processed on standard rubber processing machinery. Its targeted applications are moulded objects for interior such as toys, leather imitation for office products (covers), design articles, pieces of furniture. Applications are still in the development phase. Different grades that vary in extensibility and tensile strength can be produced. The material's natural colour is light brown but it can be coloured into a wide variety of tints.
SYRAL received the special award of R&D for Meriplast® at the Biowerkstoff-Kongress in Stuttgart in October 2009.

Why use Meriplast®?

- Sustainability: Meriplast® is 100% based on renewable raw materials and 100% biodegradable. The production process is very mild and fully complies with the principles of green chemistry.
- Mechanical and physical properties: Meriplast® has unique flexibility & elasticity properties. It shows a good resistance to torsion and folding.
- Sensory: Meriplast® displays outstanding sensory properties. It has a very good touch, a good grip without stickiness, it is permeable and absorbs water. It has a pleasant cereal smell.
- Safety: Meriplast® is not toxic when degraded in farmland soil. It does not burn in normal atmospheric conditions: it has a limited oxygen index (LOI) above 21%.

Processing Meriplast® is thermosetting and has a processing viscosity similar to uncured rubbers. It can be shaped using traditional rubber injection technology, for example on REP machinery (REP International, 69960 Corbas, France). Recommended temperature settings are 60°C in the extrusion section, 70°C in the injection chamber and 140–150°C in the mould. Typical mould shrinkage is 2.5% (determined with a calibrated plate mould).
Meriplast® is available in 15 kg reels with endless strands of 13–14 mm diameter. Different packaging is available on request.

Product stability and degradation Similarly to other natural materials such as leather or wood, Meriplast® adsorbs water but it is not soluble in water. Prolonged contact with water (e.g. dishwasher) should be avoided. Meriplast® shows full degradation after 36 days in aerobic fermentation (according to ISO 14852 based on the modified Sturm test) and 50 days in farmland soil. Meriplast® and its degradation metabolites are not toxic as tested by microbial inhibition tests.

Mechanical properties The mechanical properties of Meriplast® are similar to elastic materials such as natural rubber or thermoplastic elastomers up to 100% elongation. Ultimate tensile strength and elongation are however lower. Meriplast® exhibits a complex visco-elastic behaviour with dominant elastic features.

Table: Physical and mechanical properties of Meriplast®

Physical and mechanical properties	Hardness (Shore A-15")	Strength at 100% elongation	Strength at break (MPa)	Elongation at break (%)
MERIPLAST® N60	69	2.3	4.5	350
MERIPLAST® N50	75	2.6	4.8	320

Meriplast® displays a unique, slow elasticity. For example, after stretching the material to an elongation of 100% for 1h, the material retracts to 30% after 30 min and to 4% after 7 days.

Contact

Tereos Syral
Z.I. et Portuaire – BP 32
67390 Marckolsheim
France
Phone: +33 (0)3 88 58 60 60
info-syral@tereos.com
www.tereos-syral.com

Contact Person

Dr. Andreas Redl
andreas.redl@tereos.com

THAI PLASTIC BAGS INDUSTRIES CO., LTD

Foundation
- September 11, 1987

Turnover
- 2.9 billion Baht

Employees
- 1,000 Persons

Branches
- Nakornpathom, Thailand
  42/174 Moo 5 Soi Srisatian Niwes, Raiking, Sampran, Nakornpathom 73210 Thailand.
- Rayong, Thailand
  88 Moo 5 Makham-Ku, Nikompatana, Rayong 21180 Thailand.
- Dong Nai, Ho Chi Minh City, Vietnam
  Lot 224, Street 2, Amata IP, Long Binh Ward, Bien Hoa City, Dong Nai, Vietnam 71000

Key Materials
- Bio Flex F1130
- Biodegradable Flex 262

Key Products
- Biodegradable/Compostable Bags and Films
- Garbage Bags

Company

Thai Plastic Bags Industries Co., Ltd is one of the leading plastic film manufacturers in Asia. With the vision of being a packaging producer who has sustainable growth with all stakeholders, our company manufactures a wide range of product including carrier bags, shopping bags, T-shirt bags, Tie bags, Bin Liners, garbage bags, side seal fashion bags, soft loop bags, co-extrusion film, Food & Freezer bags, compostable/biodegradable bags certified EN 13432 Standard by DIN CERTCO, stretch hood film and Modified Atmosphere Packaging for fruit and vegetable.

With decades of experiences in the industry, we understand that your business requires reliable products in term of quality and quantity. In term of quality, we have fully integrated quality control (QC) and quality assurance (QA) systems for our production. Not only good system can ensure product quality, but also high trustworthy machines help assuring product superiority.

At TPBI, we established 3 layers co-extrusion line for high output and high value products. As a result, you can be confident in our product quality and product reliability.

Material

- Bio Flex F1130
- Biodegradable Flex 262

Products

- Shopping Bags
- T-Shirt bags
- Tie bags
- Bin Liners
- Garbage bags
- Mulch film
- Lamination film
- Food & Freezer bags


DIN CERTCO

CERTIFICATE

THAI PLASTIC BAGS INDUSTRIES CO. LTD.

Contact

Thai Plastic Bags Industries Co., Ltd
42/174 Moo 5 Soi Srisatian
Niwes, Raiking, Sampran
73210 Nakornpathom
Thailand

Phone: (662) 4290354–7,
4290693–9
marketing@tpbi.co.th
www.tpbi.co.th

Contact Person

Mr. Somsak Borrisut-tanakul
somsak@tpbi.co.th

TIANJIN GREENBIO MATERIAL CO., LTD

Foundation

- Established more than six years ago, Tianjin Green Bio Materials Co., Ltd. (Green Bio) is a high-tech Sino-foreign joint venture located in the Tianjin Economic-Technological Development Area in Tianjin, PR China.

Employees

- 180

Branches

- Headquarter: TEDA, Tianjin, China
- Export agent: Bio-Natural Tech. Co. Ltd. (H.K.)
- Agent in Europe: GreenGran B.V. (Holland)

Key Materials

- Polyhydroxyalkanoates P(3,4HB)

Key Products

- Pure Resin
- Film Grades
- IM Grades
- Foam Grades, etc.

Company

Tianjin GreenBio Materials Co., Ltd (GreenBio™) is dedicated in the development, production and sale of the fully biodegradable bio-based polymer materials PHA and its application products. So far GreenBio has established the world's largest production base of PHA in Binhai District, Tianjin and gradually goes for its dreams of industrializing production of PHA since it was discovered firstly in 1925.

GreenBio's vision is to promote developments of the applications of fully biodegradable materials in daily lives as well as to reduce the depletion of oil resources, so as to effectively decreasing the green gas emission and making great contributions to sustainable development of our society.

PHA is a biodegradable and biobased material developed via biotechnology. By replacing traditional plastics in making plastic bags and disposable items, PHA can help to eliminate these conventional "white pollutants". Apart from these, PHA can also be developed into many other forms, including fibers, films and foams. Its versatility makes it widely applicable in numerous industries, including automotive, biomedical and electronics, etc.

Moreover, due to the fact that PHA is a natural polyester synthesized by micro-organisms from phytogenic carbon sources, like starch and sugar, PHA undergoes bio-degradation readily in ambient environment, such as in landfills, sewage, river or sea, aerobically or anaerobically. That means composting is not required for decomposition of this material and its compounds in general.

Last June marked the opening of GreenBio's PHA production base in the Tianjin Economic-Technological Development Area. Production in industrial scale commenced in the fourth quater. Green Bio is the first company in China to produce 10,000 tonnes of PHA per year, with its products expected to be available all over the world. The usage of these products, meanwhile, is mainly for developing specific grades such as foam and films. On the other hand, strategic partnerships will also be formed with upstream factories in the plastic industry. As for exports, Green Bio will initially focus on Europe, which is the largest consumer of bio-degradable materials, followed by the US and Japanese markets.

国韵 生物
GREEN BIO

Material

Product: PHA and a series of compounds with PHA and other biode–gradable materials.

Properties: Good mechanical properties (tensile strength over 35 MPa) and thermal properties (HDT over 100 °C). The material will be decomposed into CO_2 and H_2O in ambient condition such as earth, fresh water, seawater, compost and sludge.

Products

- Pure resin with or without stabilizer
- Film grade for blow films & cast films
- Injection Molding grade
- Foam grade
- Single filament
- Hot melt

Contact

Tianjin GreenBio Materials Co., Ltd.
No. 128 Xinxing Road
West Zone of TEDA
300462 Tianjin
China

Phone: +86 22 25279188
Green_Bio@hotmail.com
www.tjgreenbio.com

Contact Persons

Headquarter:
liuhai@tjgreenbio.com

Export agent:
Bio-Natural Tech. Co. Ltd. (H.K.)
Phone: +852 23348791
andrewtang@bio-natural.com.hk

Agent in Europe:
GreenGran B.V. (Holland)
+31 (0)85 7857501
martin.snijder@greengran.com

WERZALIT GMBH + CO. KG

Foundation
- 1923

Turnover
- 70 million € (2010)

Employees
- 760 employees world-wide

Branches
- Wood based materials

Key Materials
- Wood materials
- Wood Plastic Composites

Key Products
- Balcony profiles
- Façade profiles
- Indoor window sills
- Terrace flooring
- Table tops
- Industrial moulded parts
- Plywood products
- WPC Compound

Company

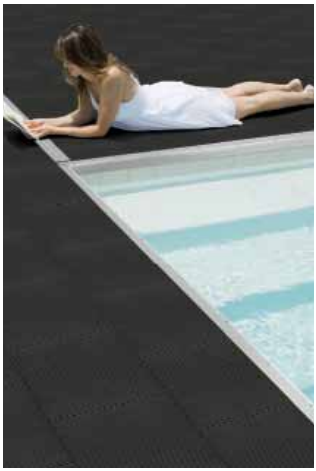
WERZALIT GmbH + Co. KG is a leading provider of innovative construction elements and custom industrial shaped parts of high-quality wood based materials. The product range includes window sills, balconies, terrace flooring, façades and table tops as well as veneers, bed slats, laminated wood and industrial products. CEO Jochen Werz views innovation as an essential principle that guides the development of new products and the use of new technologies. It was in this spirit that the company developed the completely new S2 wood-polymer composite (WPC).

The S2 wood-polymer composite for innovative concepts S2 opens up new perspectives for design and function. The combination of wood and polypropylene capitalises on the best of both materials: as easy to work as wood but with the flowing and shaping properties of a thermoplastic. S2 makes it possible to use the natural raw material of wood with injection moulding and extrusion manufacturing technologies.

Manufacturing methods WERZALIT supplies the S2 wood-polymer composite as a granulate/compound to create shaped parts such as panels, semi-finished or finished parts. With S2, it is possible to manufacture an extremely wide range of precision parts in almost any imaginable shape by varying the material recipe. For example, it is possible to create flowing

Façade with structura façade profile, profile side linea, green copper, S2.

entero solid terrace profile, brosso, marrone, in staggered pattern.



terraza terrace tile, carbone.

transitions, thin-walled structures and openings. The surface offers extensive opportunities for enhancing the design and creating an unmistakable look. S2 shaped parts can be dyed all the way through and created with a matte, polished or high-gloss finish.

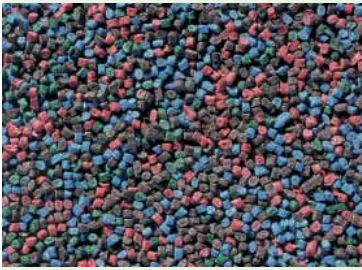
Sustainability The most important raw material for products made of the WERZALIT material is wood. Exclusively wood from sustainable forestry is used. In Germany, WERZALIT procures industrial timber entirely from local, PEFC-certified forestry operations. The PEFC certificate offers buyers of wood products the assurance that the manufacturers are promoting sustainable forest management through their actions. All WERZALIT products are PEFC-certified.

Products The new, solid terrace profiles entero are manufactured using the highly weather-resistant S2 material, to name one example. These profiles are characterised by visually closed longitudinal joints that simultaneously function as drainage joints. The advantage: entero can be installed without an incline if necessary. S2 is also finding use on the façade for the first time with the new structura façade profiles. Two different surface textures, which can be used as desired, plus four attractive colours with a metallic effect ensure modern and long-lasting façade design.

www.werzalit.com

terraza terrace profile, profile side medio, carbone.

Injection moulded part: seat for office chair of S2 wood-polymer composite.



S2 wood-polymer composite compound (WPC).

Contact

WERZALIT GmbH + Co. KG
Gronauer Str. 70
71720 Oberstenfeld
Germany

Phone: +49 (0)7062 50–0
info@werzalit.com
www.werzalit.com

Contact Person

Jörg Golombek
s2@werzalit.com

www.bio-based.eu

Pictures (left to right): Teijin, Polyone, Staedtler, Propper, Biotex, Fujitsu, Werzalit

Bio-based News

The portal for bio-based economy, bio-based plastics & composites and industrial biotechnology

Get a comprehensive overview about recent developments in the field of biomaterials and industrial biotechnology: fast – exclusive – solid – relevant

- online portal with daily news articles
- weekly newsletter
- supplier & stakeholder directory (more than 2,000 entries)
- data base with 10,000 news
- full text and index search

Your unique source of expert information on bio-based plastics & composites, industrial biotechnology, biorefineries and green chemistry

- new investments
- new product placements
- market data
- policy framework
- Research & Development

One year subscription for only: 1,000 € plus 19% VAT. The search engine as well as all keywords are fully available in English and German. The news articles themselves are 60% in English and 40% in German.

www.bio-based.eu/news

TYPICAL NEWS

- NEW **Clariant plans acquisition of Süd-Chemie AG** [2011-02-16]
  Cooperation to focus on innovation and growth in emerging markets
- NEW **Clariant AG plant Erwerb der Süd-Chemie AG** [2011-02-16]
  Zusammenarbeit soll Forschung in den Zukunftsmärkten Neue Materialien und Biotechnologie stärken
- NEW **Novozymes sucht zweites Standbein im Biobusiness** [2011-02-16]
  Kauf der EMD-Agrosparte des Chemiekonzerns Merck KGaA erlaubt neue Wachstumsziele
- NEW **LANXESS steps up commitment to biobased raw materials** [2011-02-15]
  10-year exclusive supply agreement with Gevo
- NEW **Coca-Cola says biodegradable packaging ‚not a viable option'** [2011-02-15]
  New report from Zenith International finds not all manufacturers to agree with

nova Institute for Ecology and Innovation

Engineering

COPERION GMBH

Compounding systems installed worldwide

10,000

Bulk materials handling systems installed worldwide

8,000

Employees worldwide

1,700

Network of locations worldwide

29

coperion
confidence through partnership

Company

Integrated system solutions – unique process engineering know-how – global presence. In Coperion, formerly Werner & Pfleiderer, you have a partner on hand to provide the optimum solution to every compounding task. This ranges from special applications on laboratory scale to industrial-scale production extruders. As pioneers in the development of the closely intermeshing, co-rotating twin screw extruder, we have unique expertise and experience in this field. Since the 1950s, Coperion has continued to set new standards in processing machinery and plant design for compounding technology. We plan and implement compounding systems for the plastics, chemicals and food industries which are designed precisely to our customers' applications. Over 10,000 compounding systems delivered all over the world are proof of our unique system and process competence.

Twin screw extruder ZSK Mc^{18} with specific torque of 18 Nm/cm^3.

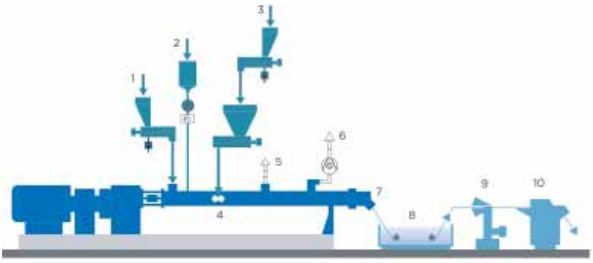
Material

Processing of biodegradable products. Processing of biodegradable products makes very high demands on the compounding process because of the variety of possible base polymers and the great differences in the formulation mixtures. Every process step in a biodegradable products processing plant must be adapted exactly to the desired mechanical properties of the end product.

We have built up a comprehensive know-how for the processing of biodegradable products with numerous implemented plants. Our specialists also benefit from our years of experience in the fields of cooking extrusion and plastic compounding which we gathered under our former name Werner & Pfleiderer.

Our twin screw extruders are the heart of the processing plants for biodegradable products. The modular structure of the process section enables individual configuration to every application so that optimal product

Compounding plant for the production of WPC Wood Plastic Composites.



Typical plant structure for the production of biodegradable products
1 Starch / powder premix I 2 Plasticizer / liquid additives I 3 Polymer pellets I 4 Twin screw side-feeder ZS-B I 5 Atmospheric degassing I 6 Vacuum degassing I 7 Die head I 8 Water bath I 9 Airknife I 10 Strand pelletizer

Typical plant structure for the production of biodegradable products.

coperion
confidence through partnership

qualities are achieved. Apart from the extruder, we also provide the entire plant periphery from the raw material feeding to pelletizing and drying of the pellets. Alternatively, it is possible to produce biodegradable products by direct extrusion.

Typical applications for the processing of biodegradable products

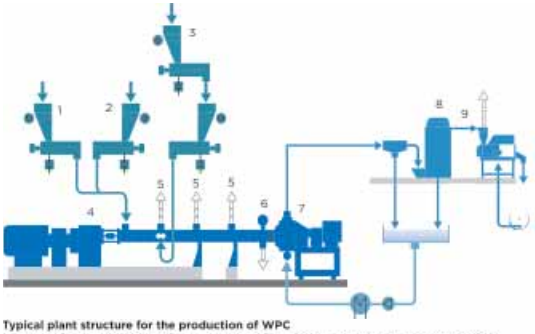
- Plastics with granular starch as a biodegradable filler
- Starch-based loose fill
- Thermoplastic starch
- Polylactide (PLA), PVOH, synthetic copolyester, PBS, PHA, PCL, CA
- Compounds of various biomaterials
- Compounds of plastics and biomaterials
- Pelletizing of PLA, polymerization of PLA

Products

Processing of WPC Wood Plastic Composites. Our twin screw extruders have proven themselves successfully on the market for the production of WPC Wood Plastic Composites for many years.
As a long-standing partner to the wood fiber industry, Coperion is well-known for its extensive process and system know-how with every process step of the compounding plants adapted individually to the application: from filling and reinforcement to devolatilization.
Coperion implements solutions for the production of WPC Wood Plastic Composites which are custom designed for your individual application – from the laboratory twin screw extruder to the industrial production plant in modular design.

Typical applications for the processing of Wood Plastic Composites

- Filling and reinforcement with 40–70% wood
- Filling and reinforcement with natural fibers such as flax, hemp, cellulose
- Compounding for injection molding applications
- Compounding in inline injection molding
- Compounding in the inline press process
- Profile extrusion with WPC profiles



Typical plant structure for the production of WPC
1 Polymer feeder I 2 Additive feeder I 3 Wood fiber feeder I 4 Twin screw extruder ZSK I 5 Degassing I 6 Start-up valve I 7 Pelletizing unit I 8 Dewatering I 9 Pellet drying

Typical plant structure for the production of WPC.

Contact

Coperion GmbH
Competence Center
Compounding & Extrusion
Theodorstraße 10
70469 Stuttgart
Germany

Phone: +49 (0)711 897–3183
uta.kuehnen@coperion.com
www.coperion.com

Contact Person

Uta Kühnen

ECON GMBH

Foundation
- ECON has been founded in 1999 as a special supplier for the plastic-producing and plasticprocessing industry

Turnover
- 5.3 million € (2010)

Employees
- 30

Branches

ECON offers solutions for four different branches:
- Masterbatch
- Compounding
- Recycling
- Virgin Material production

Key Materials
- Compounds, WPC
- Masterbatch
- Engineering plastics (e.g. PA 6, PC, ABS, PET)

Key Products
- Underwater pelletizing systems also in combination with Air pelletizing systems especially for Wood Plastic Composites
- Pellets dryers
- Melt filtration systems
- Pyrolysis cleaning systems

ECON patented thermal insulated die plate.

ECON

Company

ECON – Experts in underwater pelletizing Since more than 10 years ECON has been the specialist for underwater pelletizing technology. This well established Austrian company was able to secure themselves the innovation leadership for pelletizing systems through trend determining technical developments. The worldwide patented technology of the thermal insulation in the die head, as well as numerous other detailed solutions allows an optimization of the production process under highest demands. Well named customers with high demands on quality and service benefit from higher efficiency and shorter time for amortization every day.

Material

Processing of Bio based Plastics and Compounds The processing of bio based plastics requires highest technologies in terms of production facilities. As it is commonly known each bio based compound shows different properties concerning density, viscosity, water absorption, melt temperature and needed cooling methods.

Therefore it could demonstrate quite a challenge to process different WPCs. Besides the fact of processability also rentability can be seen as a major factor for a successful production.

That is why ECON paid strong attention to these needs and developed a combination of air and underwater pelletizing system in order to enable the production of a wide variety of different bio based plastic compounds.

The crucial advantage of this combination is the possibility to choose out of two cooling methods, as it is required for the special product being processed on the pelletizing system.

Apart from having two ways of cooling its bio based pellets, its operators benefit from the many opportunities they have with just one plant configuration.

Materials that can be produced on the ECON combination pelletizing system: All thermoplastic materials, but also all bio based plastics (e.g. PLA, PHA, WPC …)

Products

ECON EUP 50 Bio based plastics offer plenty of space for research and development in order to gain insight in new possible ways of plastics production.

For the need of material development an ordinary production plant would not meet the requirements at all, since it has to be a compact unit to be perfectly placed in laboratories where small product runs can be processed in the most effective way.

The compact under water pelletizing unit EUP 50 is perfectly made for these requirements and supports developers in their daily business. Depending on the material and the operator's intentions output can be adjusted from 2 kg/h to approximately 100 kg/h. Of course this small underwater pelletizer also benefits from the patented ECON technology; the die plate's thermal insulation. Consequently start-up is quick and easy and a huge

range of different polymers can be processed without any freezing at the die plate.
With the clearly laid out centrifugal dryer cleaning is done in a few minutes which makes the underwater pelletizer perfectly suitable for small volume production runs“with frequent material and/or colour changes. Once the material composition has proofed to be profitable, the production plant has to be as technologically highly equipped as the laboratory plant in order to reach the intended pellets outcome.
At this point the ECON combination air- and underwater pelletizing system gets important. As already noticed its advantage can be seen in having two ways of pellets cooling.
The basis definitely is the pelletizing unit which stays the same whether the material is transported by air or by water. The pelletizing unit includes the thermal insulated die plate on which many different materials can be processed with the same configuration, the knife head (the pellets get cut on the exit of the die plate) and two pelletizing housings (one for water and one for air)
In order to change Air to Water cooling a simple change of the pelletizing housing has to be done within just 20 to 30 minutes.
The electric control system has been programmed in such a manner that both ways air and water work as simple as plug and play.

Thermal insulation the ECON patented technology

All ECON pelletizing systems benefit from a special thermal insulated die plate technology. This world wide patented system delivers a lot of advantages in terms of processing.
The operation’s crucial criteria for successful granulation systems, is represented by the heat balance control in the die head. If heat transfer is too big, particular nozzles can freeze. The lower flow cross-section leads to a higher melt pressure, which again can result in lower granule quality. As a consequence production would have to be stopped and a new start-up would be necessary.
The excellent thermal behavior of the ECON pelletizing systems has the additional benefit of saving up to 70% of heat capacity. It goes without saying that as the heat energy does not get transferred into the process water, no energy has to be extracted from the process water!
Besides lower energy consumption and the optimum process stability, thermal insulation brings additional advantages, like the noticeable reduction in start-up scrap.
A bypass duct, as is required with conventional plants, is not required. The result is represented by 50 to 70 percent less start-up scrap in comparison to competitors’ systems.
Also the material’s loss and the effort for the scrap’s recycling are negligible.

ECON compact Laboratory under water pelletizing system.

Contact

ECON GmbH
Biergasse 9
4616 Weisskirchen
Austria

Phone: +43 (0)7243 56560
office@econ.eu
www.econ.eu

Contact Person

Mr. DI Johannes Scherleitner
Head of Sales and Marketing

GREINER EXTRUSION

Foundation
- 1977 as Uniplast

Employees
- 300

Key Materials
- PVC
- WPC

Key Products
- Extrusion tooling
- Extrusion machinery
- Service
- Plant engineering

Company

Within the last 25 years Greiner Extrusion has become the world market leader for tooling and downstream equipment for the plastic profile extrusion. The range of competences varies from individual tooling to complex plant engineering for the window profile production. The great development of all subsidiaries, which is based on a progressive innovation and personnel policy, helped solidify Greiner Extrusion in the position of a world market leader. The technical leading position, amongst others at tooling for the extrusion of wood fibres, did lead to the broadening of the company's product portfolio. Therefore, WPC-tooling (Wood Plastic Composites) represent an important part of the broad spectrum of products and services. With nearly 300 employees at five locations Greiner Extrusion offers you contact partners in close reach of your business.
Greiner Extrusion belongs to Greiner Tool.Tec and is thus a part of the Greiner Group – the largest family-owned company in Austria.

Products & Services

Extrusion Tooling
- Power Tooling – high performance tooling for a top production leas
- Post-Co-Extrusion – online extrusion of profile gaskets
- Co-Extrusion – grinding stock processing technologies
- WPC tooling
- Foam tooling

Extrusion Machinery
- get.IN-LINE – modular system for individual solutions
- SmartLine – standard downstream unit for single strand extrusion
- Wide Extrusion Line – your solution for the extrusion of wide profiles
- Co-Extruder – production of gaskets
- Additional Equipment

Service
- Field Service – efficient on-the-spot-service
- Spare Parts Service
- Support
- Training

Plant Engineering – complete solutions for plastic window production

Production Capacity

Greiner Extrusion together with its subsidiaries is able to realise 700 tooling per year.

Contact

Greiner Extrusion GmbH
Friedrich-Schiedel-Str. 1
4542 Nussbach
Austria

Phone: +43 (0)505 41 – 0
Fax: +43 (0)505 41 – 631
thomas.balak@greiner-extrusion.at
www.greiner-extrusion.at

Contact Person

Thomas Balak
Business Unit Manager

Company

The **Gruber Group** is a reliable supplier of tooling who is known for its especially innovative solutions and high quality within the world market. The standard version of the individual single tooling and a diversified machining program are established as quick-change-system. Hence, the customers benefit from time saving and quality advantages in the profile extrusion, which is marked by continuously increasing output.
The high-end tooling producer Gruber Extrusion GmbH is one of the global leading providers for plastics profile extrusion projects with 220 employees worldwide. True to its guiding principles the company with headquarters in Pettenbach/Upper Austria achieves a winning margin through innovation with tooling and machinery for profiles in PVC, plastics and compounds. The customer proximity policy the company pursues is demonstrated by its pilot plants in Austria, Russia and the USA plus a branch in China. Our subsidiary company Automated/USA is specialised in tooling for WPC and BPC since many years and has realised a big number of tooling for this range of application.
Gruber Extrusion belongs to Greiner Tool.Tec and is thus a part of the Greiner Group – the largest family-owned company in Austria.

Products

Extrusion Tooling

- Gruber Effex Die – higher efficiency and flexibility for the production
- Gruber CoFlex Die – Coextrusion with quick-change-system
- Woodex – Toolings for WPC and BPC profiles
- Dry / Vacuum Water Tank System
- Dry Water Bath-System
- PCE-System

Extrusion Machinery

- Win-Line – economic and long-lasting
- CT-Series – flexible and individual
- Combi-Line – compact and efficient
- Co-Extruder – precise and easy handling

Window Systems

- Tilt-Turn systems, Sliding systems, Casement systems, Roller shutter systems

Turn-Key-Projects – all from one hand

- Feasibility studies and Consulting
- Engineering
- Manufacturing
- Installation and Commissioning

Production Capacity

Gruber Extrusion with its subsidiaries is able to realise up to 300 tooling per year.

GRUBER EXTRUSION

Foundation
- 1993

Employees
- 220

Key Materials
- PVC
- WPC

Key Products
- Extrusion tooling
- Extrusion machinery
- Turn-key-projects
- Window systems

Contact

Gruber & Co Group GmbH
Emesbergstr. 33
4643 Pettenbach
Austria

Phone: +43 (0)7586 7777–0
Fax: +43 (0)7586 7777–419
www.gruberextrusion.com

Contact Person

Richard Fußberger
CEO

HARBURG-FREUDENBERGER MASCHINENBAU GMBH

Foundation
- 1942

Employees
- ~240

Branches
- Mixing room equipment for rubber and plastic applications

Key Products
- Internal mixers
- Dump extruders
- Automation systems
- Complete mixing lines
- Customised engineering

MIXING GROUP

Company

Applying our competence in mixing room technology to your Wood Plastic Composites and Natural Fibre reinforced Plastic compounds. Harburg-Freudenberger Maschinenbau, a company within the HF MIXING GROUP, is traditionally focused on the rubber business and so heavy duty internal mixers became one of the key products.

Following the increasing interest for Wood Plastic Composites (WPC) and Natural Fibre reinforced Plastics (NF-P) as well as requests for new compounding technologies tailored to the special demands of these materials, Harburg-Freudenberger has recently developed very successfully mixing room solutions based on internal batch mixer technology with intermeshing rotor design.

Today our latest generation of machinery sets a new standard for the compounding of Wood Plastic Composites and natural fibre reinforced plastics. This development, combined with our specialized automation control system **ADVISE ES** and its functional modules **ADVISE ES Batch Temperature Limit Control** and **ADVISE ES Ram Position Profile**, has raised the bar in compounding.

All statements are based on intensive research and development work in our world-wide established R&D centre which is also available to our customers for proving their own compounds. Equipped with state-of-the-art mixing room technology we offer the opportunity to carry out mixing trials from laboratory to production scale. This provides our customers the possibility to confirm the capability of our machines under real production conditions before making an investment decision.

Besides Harburg-Freudenberger's internal batch mixer technology, Farrel Corporation, another company within the HF MIXING GROUP, again with a vast experience in mechanical engineering related to the Rubber and Plastics Industry has within its' product portfolio the Farrel Continuous Mixer (FCM) and Long Continuous Mixer (LCM) which have demonstrated their ability to successfully incorporate high levels of mineral fillers into various biodegradable polymers giving excellent dispersion whilst operating at low specific energy levels – offering potential for cost savings. Farrel also give the opportunity for customers to run their formulations on mid-sized production machine to verify product quality and scale up parameter to other equipment within the range. For further information regarding products of the Farrel Corporation please visit the homepage of the HF MIXING GROUP.

MIXING GROUP

Products

Innovative compounding technology for Wood Plastic Composites (WPC) and Natural Fibre reinforced Plastics (NF-P) Harburg-Freudenberger provides innovative and individually designed mixing room solutions based on internal mixer technology. The internal mixer technology is capable of incorporating high contents of fillers into various polymers. Typical fillers include, however, may not be limited to: wood flour, technical wood fibres, natural fibres such as kenaf, jute, hemp, cellulose etc. Depending on the plant configuration and the raw materials to be processed, throughputs of more than 3,000 kg/h per mixing line are possible.

Apart from the mixing line key components such as internal mixer and dump extruder, we also can provide the entire plant periphery from raw material feeding to ready packed granulate including PLC control system ADVISE CS and our automation system ADVISE ES. Turn-key solutions are possible as well.

Advantages of the internal mixer technology The internal mixer technology has been well established in the rubber industry for many decades and also offers various advantages for the production of WPC and NF-P:

- High degree of automation guarantees excellent process control, process repeatability and process documentation.
- Fast and optimal adjustment of the process of each material by independently variable process parameters such as mixing time, rotor speed, time and order of addition, ram pressure, fill factor and temperature control.
- Equipment is highly flexible to different forms of natural fibres to be processed - no modification of the equipment configuration is required.
- Direct incorporation of biological raw material components in a one-stage mixing process without any pre-treatment – no pre-cutting or pre-drying process is required. Also raw materials with moisture content of more than 20% can be directly processed.
- Compounds having filler contents of more than 80% and moisture contents less than 1% can be achieved.
- No thermal degradation of the bio-fibre raw materials during compounding by the use of modern controllers and precise process control.
- Surplus or scrap plastic components can be directly introduced into the machine as recycled material – no pre-treatment required.
- Significantly better product properties and superior mechanical characteristics.
- Substantially lower absorbed water content of the final product checked against conventional processes.

Contact

Harburg-Freudenberger Maschinenbau GmbH
Asdorfer Str. 60
57258 Freudenberg
Germany

Phone: +49 (0)2734 491 – 0
www.hf-mixinggroup.com

Contact Person

Dipl.-Ing. Karsten Fischer
karsten.fischer@hf-group.com

NEXT GENERATION RECYCLING-MASCHINEN GMBH

Foundation
- 1996

Turnover
- 17 million €

Employees
- 60

Branches
- USA
- Malaysia

Key Materials
- Starch-based biopolymers
- PLA

Key Products
- Recycling machines

Company

NGR – simply one step ahead NGR stands for Next Generation Recycling Machines. This is the company name, as well as it stands for its innovative technology. NGR builds machines for the reprocessing of thermoplastic waste of conventional plastics as well as Biodegradables.

With NGR's ONE-STEP technology, a patented cutter-feeder-extruder combination, there is no additional pre-cutting systems necessary. Without ever leaving the machine nearly every thermoplastic material can be pelletized back to high quality raw material. As a result reprocessing costs are low and manpower requirement reduced to a minimum. Due to the gentle extrusion process which ensures minimum degradation of the material NGR recycling machines are also very well proven on biodegradable plastics.

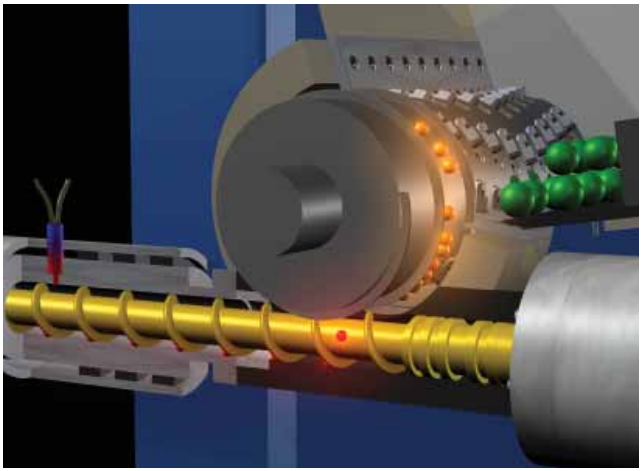
Recycling of bio-based production waste In most plastics production processes there is waste coming along with the products that converters aim at. Experience shows that in most of the cases 2 to 10% of the pro-

duction material is lost due to process reasons. The easiest way of recovering this material is to shred it to chips and reefed them to the process together with the new material, but as easy as that is, it can lead to different process difficulties.

In many cases it is favourable to use a recycling extruder, bringing the material back to melt and then to pellets that are of the same quality as the virgin material. The choice of the optimal recycling technology is mainly driven by the objective to bring the material through the process without damaging its chemical and physical properties. Some conventional plastics even have to be handled with care during processing in order to avoid material degradation. The more this is an issue for most biopolymers, some of them being processed at relatively low temperatures of 140°C or being very sensitive to oxidation due to being exposed to air when heated.

NGR's recycling solution NGR recycling machines with an output range from 20 to 2,000 kg/h feed the material to the extruder by an integrated cutter-feeder, which consists of a slow rotating cutter shaft with knives that cut against fixed knives like a scissors and a feeding zone that conveys the material to the extruder without pre-heating it.

NGR expects that with the increasing use of biodegradables, recycling of processing waste will gain further importance. So, NGR see themselves well prepared for the actual and future demands of these applications.



Contact

Next Generation Recyclingmaschinen GmbH
Gewerbepark 22
4101 Feldkirchen
Austria

Phone: +43 (0)7233 70107–0
Fax: +43 (0)7233 70107–2
uwe.bonten@ngr.at
www.ngr.at

Contact Person

Uwe Bonten

REIFENHÄUSER EXTRUSION GMBH & CO. KG

Foundation
- 1911

Turnover
- 450 million €

Employees
- 1,200

Branches
- Machine building for the plastic processing industry

Key Materials
- All kinds of plastic
- Wood Polymer Composites (WPC)

Key Products
- Extrusion lines

Reifenhäuser
The Extrusioneers

Company

Innovative force as a motor for success Constant research and development of Reifenhäuser EXTRUSION's line concepts are the focus of the leading manufacturer of high performance extrusion systems. The resulting innovations ensure the company's competitive edge worldwide. The use of new raw materials, in particular, and the associated changes in process technology require ever new solutions.

The benefit of its customers is always given the highest priority in all actions and considerations of Reifenhäuser EXTRUSION. Competitive advantages are generated from its employees' creativity, from superior and economically efficient technology, from speediness and convincing customer service.

The comprehensive portfolio includes extrusion lines for thermoforming sheet, cast film and WPC in addition to extruders and components. Future-oriented products, market-driven strategies and direct relationship with customers are ideal prerequisites that allow rapid and direct response to changes in the marketplaces.

Products

Although the success story of Wood Polymer Composites (WPC) has just begun, the issue of wood extrusion is not new to Reifenhäuser. Already in 2004, the company began to concentrate on the extrusion of wood fibre reinforced plastics for which different types of extruders are used, depending on the production method.

The basic component of Reifenhäuser WPC production lines is the new generation of the "BITRUDER" twin-screw extruders. Available in market-conforming sizes from 65 to 135 mm screw diameter and provided with parallel, counter-rotating intermeshing screws they offer ideal prerequisi-

Reifenhäuser
The Extrusioneers

tes for the processing of wood fibres and thermoplastic materials such as PE, PP and PVC.

Beside compound extrusion, Reifenhäuser is increasingly focussing on the future-oriented, highly flexible direct extrusion process. This technology combines mixing, melting and direct processing of the individual components into the final product (profiles, pellets) in a single operation. The advantage of Reifenhäuser direct extrusion lines is that they can process up to 80% wood at the same output rates than compound extrusion lines, but offer higher flexibility. Further pluspoints are their reduced space and energy requirement and low initial investment costs.

Capacity losses experienced in direct extrusion (up to 50% compared to compound extrusion) could be completely eliminated.

The "BITRUDEX" direct extrusion technology developed and patented by Reifenhäuser forms the basis of this process. Key components are a counter-rotating twin-screw extruder (BITRUDER) and a gearless single-screw extruder (REItorque) combined to form a cascade-like assembly. This design enables fibres to be processed with about 12% humidity at speeds iqual or higher than in conventional compound extrusion and, what is more, without sacrificing the quality of the end product. In addition, this process allows the production of high-strength, UV-stable WPC profiles from PMMA.

A guarantee-model of more than 20,000 operating hours given on the system's wear parts screws and barrels, and complete WPC solutions including the manufacture of WPC tools as well as service, research and development characterise Reifenhäuser as an established world market leader in this segment.

Direct-Extrusion BiTrudex 115 II.

Contact

Reifenhäuser Extrusion GmbH & Co. KG
Spicherstr. 46–48
53844 Troisdorf
Germany

Phone: +49 (0)2241 481–0
Fax: +49 (0)2241 481–555
info@reifenhauser.com
www.reifenhauser.com

Contact Person

Thomas Eisemann
Head of Sales/Extrusion Center

Pictures: Werzalit, Kosche

Advertisement

Fourth German WPC-Congress

December 13th and 14th 2011, Maritim Hotel, Cologne (Germany)

Wood Plastic Composites (WPC) are thermoplastic compound materials made from wood and plastic for the building, furniture, automotive, consumer goods, packaging industry and other applications. With a production of about 170,000 t/a, WPC are the most important and most successful new bio-based products in Europe.

- Industries and applications
- Market situation and trends
- Processing methods and material properties
- Research and Development
- Innovation Awards "product" and "process"

Praxis-oriented for developers, producers, commerce and users.

The Fourth German WPC-Congress (December 13th and 14th 2011, Maritim Hotel of Cologne / Germany)

Already for the fourth time the nova-Institute GmbH is organizing the German WPC-Congress on December 13th and 14th 2011. Leading enterprises and research establishments present their newest developments regarding Wood Plastic Composites in the elegant ambience of the Cologne Maritim Hotel. A large exhibition, various association activities and an innovation award will be forming the framework of the biggest European WPC event.

The congress is putting the focus on the subjects of the German-speaking WPC branch, however, the speakers, exhibitors and participants are international – all talks are translated simultaneously. In 2009 300 participants from several countries visited the Second German WPC-Congress and made it thus the biggest branch meeting in Europe.

Preliminary programme

Speakers of leading enterprises and research establishments will be talking about their newest material developments regarding injection moulding, window and facades elements, pieces of furniture, design and the application of bioplastics. Current information about high-class standards and new markets complete the programme.

Innovation Award on WPC

This year the innovation award regarding WPC will also be awarded by the nova-Institute: for materials / products and for procedures. Election, presentation and awarding of the winners will take place at the Fourth German WPC-Congress.

Further informations are available at www.wpc-kongress.de and at www.bio-based.eu

Sponsor

Reifenhäuser
The Extrusioneers

Organiser

nova Institute for Ecology and Innovation

Contact
Dipl.-Geogr. Dominik Vogt, Phone: +49 (0) 2233 48–1449,
dominik.vogt@nova-institut.de

Associations and Agencies

BELGIAN BIOPACKAGING VZW / ASBL

Foundation

■ 2006

Association

The Belgian BioPackaging association was founded in 2006 and was the result of initiatives taken by companies involved in the production or use of compostable packaging made from renewable resources.

Service

The main target of the association was and still is to get the green waste bin open for certified compostable packaging and disposables.

Although not yet realised, the Belgian BioPackaging association obtained with targeted lobbying work some important modifications to the local waste legislation and supported the creation of the first law (royal decree) in Europe that defines the terms “compostable”, “home compostable” and “degradable in the soil”. This same law prohibits the use of the term “bio-degradable” on the packaging.

Where the end-of-live of the products was our first focus, we now decided also to give more attention to the organic origine of the raw materials, the renewability of the basic material.

The Belgian BioPackaging association is a platform for its members to share information and exchange news on bio-packaging and/or other compostable products made from renewable materials (and not only bio-plastics).

Contact

Belgian BioPackaging vzw/asbl
August Reyerslaan 80
1030 Brussels
Belgium

Phone: +32 (0)3 354 14 42
Fax: +32 (0)3 354 36 16
info@belgianbiopackaging.be
www.belgianbiopackaging.be

Contact Person

Mr. Dirk Wens
President

Club Bio-plastiques

Association Française pour le Développement des Bioplastiques

Association

The Club Bio-plastiques is the branch association representing the entire value chain of the bioplastics' industry, from renewable raw materials to end of life. It supports the interests of its members regarding the promotion and development of bio-based plastics biodegradable.

The association is actively involved at the European level.

Service

To support the interests of its members regarding promotion and development of bioplastics.

To insure bioplastics technical knowledge thanks to its member's expertise.

To help building a new environmental friendly business development through its network representation.

Courtesy of Biolice, Novamont, SPhere.

CLUB BIO-PLASTIQUES

Foundation

- 2007

Employees

- 1

Branches

- Bioplastics sector from raw materials to end of life

Key Materials

- Biopolymer
- Bio-based plastic
- Biodegradable and compostable plastic
- Packaging
- Mulching
- Composting
- End of life
- LCA

Key Products / Services

- Club Bio-plastiques supports its members' interests regarding promotion end development of bioplastics.

Contact

Club Bio-plastiques
4, place d'Estienne d'Orves
75009 Paris
France

Phone: +33 (0)1 48 785 100
info@bioplastiques.org
www.bioplastiques.org

Contact Person

Florence Nys
fnys@bioplastiques.org

CLUSTER BIOPOLYMERS/ BIOMATERIALS

Foundation
- 2006

Employees
- Cluster management: 2

Network
- 70 companies
- 40 research facilities
- 10 service providers
- Institutional & financing partners

Branches
- Suppliers of renewable raw materials
- Biotechnology
- Bioplastics manufacturing
- Biopolymer processing and compounding
- All different kinds of end users

Key Services
- Technology transfer
- Partnering
- Project initiation
- Funding support
- Public relations
- Workshops
- Marketing

Biopolymers Biomaterials

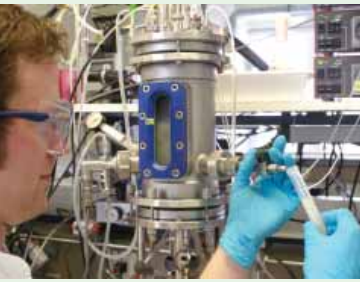
THE CLUSTER

Cluster

The Biopolymers/Biomaterials cluster was established in 2006 under the general management of BIOPRO Baden-Württemberg GmbH with the objective of participating in the BioIndustrie 2021 competition run by the German Ministry of Education and Research (BMBF). In May 2007, the Biopolymers/Biomaterials cluster was chosen as one of five winners and the BMBF set aside ten million euros for the implementation phase (between 2007 and 2012). So far, the funds have been used to support three cooperative projects; further projects are in the planning stage. The Baden-Württemberg government's innovation agency, BIOPRO Baden-Württemberg GmbH, is coordinating the work of the cluster.

Aims

The plastics industry in Western Europe achieves annual revenues of 135 billion euros and employs more than one million people. The growing demand for plastics, the dependence of the plastics industry on fossil resources, the demand for innovative materials and growing environmental awareness – all these factors urgently require new innovative manufacturing methods to be put in place. The goal of the Biopolymers/Biomaterials cluster is to effectively and sustainably support the development process of biotechnologically produced source materials for polymers and materials. The BMBF-funded projects are tasked with developing and optimising innovative plastics using bioprocess engineering as well as microbiological and biotechnological methods. The cluster is also tasked with creating a growing network of actors with an interest in biopolymers/biomaterials and with bringing together companies and research institutions working in different industrial sectors. Moreover, in common with all the other winners of the BMBF competition, the cluster also aims to have an influence on general conditions in the sector, for example by strengthening industrial biotechnology and positively shaping the transition to a bioeconomy. Open exchange with politicians and the general public is indispensable for ensuring a smooth transition and removing obstacles to innovation.



Bioreactor for experiments carried out in research laboratories. Picture: BIOPRO/Bächtle.

Wood, starch, plant oils: Examples for renewable resources. Picture: BIOPRO.

Biopolymers Biomaterials

THE CLUSTER

Activities and services

The Biopolymers/Biomaterials cluster works across and brings together value creation chains and different industrial sectors in the field of bioplastics. Existing competences in biotechnology and process engineering will be combined with methods used in chemical process engineering/polymer chemistry and plastics technology. By bringing together actors along the value creation chain, the cluster's members are creating an optimal environment for innovations. Cluster membership is non-binding and free of charge. In addition, services offered by the cluster management organisation are free of charge.

At annual network meetings, the cluster members will be able to attend lectures on practical issues, panel discussions and expert talks on state-of-the-art topics related to bioplastics manufacturing and application. The BIOPRO Baden-Württemberg internet portal provides specific information on biopolymers under www.biopolymerics.com. Cluster members are entitled to publish profiles of their companies and research institutions free of charge. In addition, the cluster presents the "Biopolymers/Biomaterials" topic as well as innovative materials/products at (inter)national meetings and exhibitions, and supports the organisation of industry-specific meetings such as the "International Symposium on Biopolymers (ISBP)" in Stuttgart.

With the "Bioplastics Design Challenge" the cluster has set the ball rolling on an initiative run by BIOPRO Baden-Württemberg that aims to support the innovation process and boost the public perception of the bioplastics sector. Every year, commercial bioplastics and bioplastics under development will be evaluated in terms of design for use in different industries and will undergo further development. In its first year, the "Automotive Bioplastics Design Challenge – abdc" will focus exclusively on the automotive sector. The results will be presented to the public during the "Automobile Summer 2011", 125 days and a multitude of events devoted by the Baden-Württemberg government to commemorating the invention of the car in 1886.

Examples of the application of bioplastics. Picture: BIOPRO/Bächtle, TAKATA-PETRI AG. Prototypes: ITV Denkendorf, fischerwerke GmbH & Co.KG, TAKATA-PETRI AG.

Motor engine cooling fan and housing module made from Nylon-5,10. Picture: BIOPRO/Bächtle. Prototype: Robert Bosch GmbH.

Contact

Cluster Biopolymers/Biomaterials
c/o BIOPRO Baden-Württemberg GmbH
Breitscheidstr. 10
70174 Stuttgart
Germany

Phone: +49 (0)711 218185–14
Fax: +49 (0)711 218185–02
biopolymere@bio-pro.de
www.biopolymerics.com

Contact Person

Markus Götz

BIOCHEM

Coordinator

- Chemistry Innovation Ltd

Partners

- 17 partner organisations from 7 European countries, including innovation agencies, business support tool developers, and consultancies.

Branches

- Bio-plastics
- Bio-lubricants
- Bio-surfactants
- Enzymes

Key Products / Services

- Business support to start-ups and SMEs considering producing bio-based products

Contact

Chemistry Innovation Ltd
The Heath, Runcorn
Cheshire WA7 4QX
United Kingdom

Phone: +44 (0)1928 513513
info-biochem@ciktn.co.uk
www.europe-innova.eu/biochem

Contact Person

Steven Fletcher

Project

Launched in February 2010 BIOCHEM is a pan-European project co-funded by the European Commission to support companies wishing to innovate in the rapidly emerging market of bio-based products.

Service

The European Union currently accounts for about 30% of the global 58 billions euros bio-based products market which is expected to more than treble by 2020. However, innovation in this sector is inhibited by a number of factors including:

- Lack of awareness of industrial biotechnology and its benefits
- Uncertainty about market demand
- Lack of confidence to enter a new business involving new supply chains
- Need for a significant technology investment
- Limited access to specialist demonstration facilities

The objective of BIOCHEM is to support start-ups and SMEs in overcoming these barriers and help them launch successful bio-based businesses. To this end, BIOCHEM has developed a toolbox that will be tested with 250 selected SMEs by 2013.

What can BIOCHEM offer you?

- A complete assessment of your current business activities and an opportunity analysis, in order to determine your strengths and weaknesses and to maximize your chances for success when launching your new product
- Business and market information, advices and individual coaching from experts, tailored to your company needs
- Assistance in finding the right persons (experts or business partners) and facilities in order to develop your product
- Tools to help you find funding, be it at the national or European level
- The possibility to take part in free partnering events, in order to meet and share information with other experts working in the field of bio-based products, from all over Europe
- A unique occasion to promote your company and business activities at international level

More information Wishing to take part in the project? Visit www.europe-innova.eu/biochem to know more about BIOCHEM.

Looking for business partners from industry, academia or research organisations? Register now on the BIOCHEM Partnering Platform: www.biochem-project.eu

Considering setting up a business in the bio-based market? Meet face-to-face with European biotech investors and venture capitalists at the BIOCHEM Accelerator Fora. Details available on www.e-unlimited.com/biochem

www.ecocomp-conference.com

ecocomp

Ecocomp 2011: Sustainable Materials, Polymers & Composites

The Studio, Birmingham
6 - 7 July 2011




Continuing the success of previous Ecocomp Conferences, the 2011 event will explore the future direction of international research and application of sustainable materials, polymers and composites within the academic, industrial and wider social environments. Areas to be addressed include:

- Natural fibres and composites
- Wood plastic composites
- Bio-derived resins and adhesives
- Biodegradable composites
- Eco-design
- Sustainability
- End of life options including recycling
- Industrial applications
- Social policy & consumer acceptance
- Life cycle analysis
- Green nano-composites

For more details about the conference including registration information please visit the website at **www.ecocomp-conference.com**.

Organiser

netcomposites
www.netcomposites.com

Headline Media Partner

eco composites
www.ecocomposites.net

DECHEMA E.V.

Foundation
- 1926

Employees
- ~200

Branches
- Chemical Industry
- Process Industry
- Bio-based Industry
- Biotechnology

Key Products / Services
- World Forum of the Process Industry (ACHEMA)
- Organisation of > 50 events per year
- 20 task forces
- Position papers
- Research
- Continuous education
- Consulting
- Coordination of funding projects

Contact

DECHEMA e.V.
Society for Chemical Engineering and Biotechnology
Theodor-Heuss-Allee 25
60486 Frankfurt am Main
Germany

Phone: +49 (0)69 7564–0
info@dechema.de
info@achema.de
www.dechema.de
www.achema.de

Contact Person

Dr. Andreas Scriba
scriba@dechema.de

ACHEMA 2012 – The world's biggest event for the process industries

ACHEMA, the world forum of the process industry, takes place every three years in Frankfurt am Main, Germany, and is organized by DECHEMA e.V. (Society for Chemical Engineering and Biotechnology). This summit of leading companies is a unique platform for new perspectives, an intensive dialogue between suppliers and buyers, and the identification of synergies. The event will showcase the large variety of what is technologically possible in process engineering today.

Based on the figures of ACHEMA 2009, we expect:
- 4,000 exhibitors from 50 countries
- 180,000 participants from 100 countries
- 30,000 executives
- 900 lectures
- Exhibitor satisfaction (rating of ACHEMA 2009): 79% good or very good

Bio-based World: Technologies & Products for the Bioeconomy "Technologies and Products for the Bioeconomy" will be one of the central topics of ACHEMA 2012. In an era of increasingly expensive and dwindling fossil resources, there is an unprecedented demand for new technologies. Hence topics like bioenergy (e.g. biofuels, biogas, biomass), bio-based products (e.g. bioplastics, bio-based chemicals, biocomposites) and bioproduction, are key elements of both the exhibition and the congress.

Networking of research and technology In addition to the exhibition, ACHEMA's second cornerstone is the international congress, comprising more than **900 lectures**. Paper submission will be open **to August 31, 2011**.

Visibility ACHEMA is the unique global showcase for the chemical process industry and biobased industries. About **1,000 accredited journalists** from all over the world will generate a media response that reaches the entire industry and beyond.

About DECHEMA e.V.

DECHEMA – Society for Chemical Engineering and Biotechnology – is a non-profit scientific and technical society. It has more than 5,800 personal and institutional members. DECHEMA promotes and supports research and technological progress in chemical engineering and biotechnology, and is an interface between science, industry, and society.

european bioplastics

Association

European Bioplastics is the branch association representing industrial manufacturers, processors and users of bioplastic polymers and their derivative products. Our members range from highly specialised manufacturers over major listed companies to research institutes.

Sustainable solutions and a dynamic development combined with solid market growth – these are the main characteristics of the bioplastic industry. Across all classes of materials, investments into bioplastic applications are rising steadily. European Bioplastic's vision is to provide advanced bioplastic material for a sustainable society.

Bioplastics

Bioplastics become an increasingly important industrial material. Featuring a range of advantageous properties, bioplastics are applied in many different sectors. They are bio-based, biodegradable, or feature both of these environmental beneficial properties. Bioplastics represent an ever growing range of materials that can be used wherever sustainable plastic products shall be employed.

Pictures (left to right): Keyboard Fujitsu, Biobag, Ski boot, Bottle. EuropeanBioplastics.

With respect to resources European Bioplastics supports a comprehensive sustainable approach. Renewable resources are a valuable raw material and must be handled efficiently. Usage cascades can be a way for optimising the benefits of bioplastics by using them first to create materials and afterwards for energetic purposes.

Activities Driven by sustainability and innovation we work in partnership with various stakeholders to shape a favourable landscape for growth of the whole bioplastics value chain. Our members rely on European Bioplastics as their platform:

- to gain knowledge about the industry as a whole,
- to communicate their messages,
- to represent their policy interests,
- to connect them with new business partners,
- for a dynamic and open stakeholder dialogue regarding overarching issues.

EUROPEAN BIOPLASTICS

Foundation
- 1993

Employees
- 10

Branches
- Complete value chain of bioplastics industry

Key Materials
- All plastics that are bio-based, biodegradable, or both

Contact

European Bioplastics e.V.
Marienstr. 19-20
10117 Berlin
Germany

Phone: +49 (0)30 28 482 – 350
press@european-bioplastics.org
www.european-bioplastics.org

Contact Person

Kristy-Barbara Lange
Head of Communications

Advertisement

8th International Conference of the European Industrial Hemp Association (EIHA)

May 18th – 19th 2011

Rheinforum, Wesseling / near Cologne (Germany)





Pictures: Hempro Int., Lotus Cars, Hemp Technology Ltd, NPSP Composites

The congress will focus on the latest developments concerning hemp and other natural fibres.

Congress language: English

www.eiha.org/8

Focus on bio-composites

The spectrum of participants will range from

- cultivation consultants,
- primary and further processors,
- traders, mechanical engineers,
- investors to enterprise to
- suppliers (for example: insulation material, pulp & paper, automotive).

They all share common interest in the industrial utilisation of hemp fibres and shivs. Other topics are hemp seeds and hemp oil in nutrition.

Don't miss the biggest industrial hemp event in 2011 – world wide!

Exhibition

You are welcome to present your latest products, technologies or developments – book a stand and a bulletin board now for only 200 EUR (plus 19% VAT).

Sponsor

Hempro Int. Production Sales Consulting

www.hempro.com

Organiser

nova Institute for Ecology and Innovation

www.nova-institut.de/nr

In co-operation with

EIHA European Industrial Hemp Association

www.eiha.org

Partner

www.internationalhempbuilding.org

CHTA

www.hemptrade.ca

Contact: Dipl.-Geogr. Dominik Vogt, Phone: +49 (0) 2233 48 – 1449, dominik.vogt@nova-institut.de

EIHA European Industrial Hemp Association

Association

EIHA was originally founded as an association of the members of the European Hemp industry. Regular members include primary Hemp processors in the EU. Associate members may be associations, research organisations and companies and individuals working in the area of Hemp and other natural fibres. Founded in 2005, EIHA today has 8 regular and more than 65 associated members from 25 countries. EIHA was founded to give industry a voice at the European Commission in Brussels. It has rapidly become a respected industry association that provides effective lobbying and serves as an information bank.

The annual EIHA conference (more than 150 participants from 30 countries) has become an attractive opportunity for members and visitors to meet, learn about developments and exchange views with their colleagues. The conference is the most important event on industrial Hemp – worldwide!

European Hemp Fibres are available for your bio-based products Today, China, Canada and Europe are the main Hemp cultivation areas in the world. In 2010 the total cultivation area in the European Union was around 15,000 ha. These areas will produce around 24,000 t Hemp fibres. All by products like shivs (woody part of the Hemp stem) and dust are used. Main countries for Hemp production are France, UK, Germany, The Netherlands and Poland. Hemp fibres, ready to use in your bio-based products are price competitive to other domestic and exotic fibres for technical applications. Different qualities are available.

European Hemp fibre is currently used mainly in technical applications like speciality paper (cigarette paper, technical filters), insulation material, natural fibre reinforced plastics (automotive, industrial and consumer goods), mulch and cultivation fleeces. Especially insulation and plastic reinforcement show promising market increases. Different options for feeding Hemp fibres in injection moulding processing are available today.

The EIHA Hemp processors produce on average each year between 10,000 and 15,000 tonnes of technical Hemp fibres. As Hemp is an annual crop this quantity can be easily increased according to demand.

Please find the Hemp processors for your demand on www.eiha.org

Pictures (left to right):
Winter & Linotech, Hock, Lotus cars.

EUROPEAN INDUSTRIAL HEMP ASSOCIATION (EIHA)

Foundation

- 2005

Members

- Regular members: 8
- Associate members: 65

Key services

- Effective lobbying at the European Commission in Brussels
- Consulting
- Networking
- Huge EIHA database, more than 300 presentations, reports and documents

Contact

European Industrial Hemp Association (EIHA)
nova-Institute GmbH
Chemiepark Knapsack
Industriestr. 300
50354 Huerth
Germany

Phone: +49 (0)2233 4814–49
Fax: +49 (0)2233 4814–50
info@eiha.org
www.eiha.org

Contact Person

Michael Carus
Managing Director

FACHAGENTUR NACHWACHSENDE ROHSTOFFE E.V. (FNR)

Foundation
- 1993

Employees
- 63

Branches
- Funding
- Advisory

Contact

Fachagentur Nachwachsende Rohstoffe e.V. (FNR)
Hofplatz 1
18276 Gülzow
Germany

Phone: +49 (0)38 436930–0
Fax: +49 (0)38 436930–102
info@fnr.de
www.fnr.de
www.nachwachsende-rohstoffe.de

Agency

The Fachagentur Nachwachsende Rohstoffe e.V. (FNR) is promoting the use of agricultural and forest resources on behalf of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV). FNR coordinates activities on renewable resources in Germany.

FNR is the central coordinating agency in Germany for the funding of research, development and demonstration projects. However, its tasks also include providing information and advice to a wide range of different target groups as well as supporting the market introduction of products made from renewable resources.

By means of various publications and events, FNR not only ensures that specialists can keep up-to-date with the latest scientific developments, but also increases public awareness of renewable resources.

Activities

As part of the funding programme “Renewable Resources” and the “Directive on Bioenergy Demonstration Projects” the BMELV, through FNR, funds about 400 research, development and demonstration projects on renewable resources each year. The aim is to make domestically produced renewable resources a realistic and viable alternative to fossil fuels.

In case when products are ready for the market but unlikely to be competitive as yet, the BMELV helps with the market introduction through specific funding initiatives.

FNR acts as an advisory agency to the Federal Government, the Federal States, industry, the agricultural and forestry sectors and other interest parties.

Consumer information is of vital importance. Despite recent increases in the use of renewable resources for energy and as raw material for a wide range of products, there is still much to be done to raise awareness.

Since 2003, bioenergy has been one of the major focuses of FNR’s advisory services. This service targets people who operate bioenergy plants, those planning them and those wishing to invest in them, as well as at consumers who are considering using renewable energy from biomass.

The Building and Home advisory service is intended for house-builders, architects and craftsmen who wish to use the wide range of innovative products from renewable resources that are available for building, decoration and furnishing homes.

In 2010 FNR established an additional advisory service especially for communities that are interested in the usage of bioenergy and products from renewable resources.

On European level FNR is coordinating several EU-projects in the field of renewable resources.

Federal Government’s action plan for the industrial use of renewable resources The activities of FNR received major boost by the Federal Government’s action plan for the industrial use of renewable resources which is adopted in 2009. Especially for biobased raw material, several action areas are defined, from the development of research up to the assembly of a biopolymer network.

Cluster

The “Industries and Agro-Resources” Cluster unites stakeholders from research, higher education, industry & agriculture in the Champagne-Ardenne and Picardy regions of France around a shared goal: the added-value non-food exploitation of plant biomass.

The IAR cluster has defined 4 strategic fields of activity under the biorefinery concept: bioenergy, biomaterials, biochemicals, bioingredients.

The IAR Cluster puts its experience and know-how at the disposal of businesses and research laboratories wishing to exploit the wealth of plant-based assets and develop R&D projects in the field of non-food exploitation of agricultural resources

Service

The IAR cluster performs various missions:

- Management of R&D projects, from the idea… to the funding
- Coordination and networking of interregional skills
- Development of international collaborations and delegations
- Provision of information and strategic intelligence
- Promotional and public relations activities

IAR

Foundation

- Industries & Agro-Resources Cluster

Employees

- 10

Branches

- Bioenergy
- Biomaterials
- Biochemicals
- Bioingredients

Key Materials

- Agro-resources

Contact

Industries & Agro-Resources Cluster
50–52 Bd Brossolette
02930 Laon
France

Phone: +33 (0)3 23 232 525
contact@iar-pole.com
www.iar-pole.com

Contact Person

Christophe Luguel
luguel@iar-pole.com

NATIONAL INNOVATION AGENCY (NIA)

Foundation
- 2003

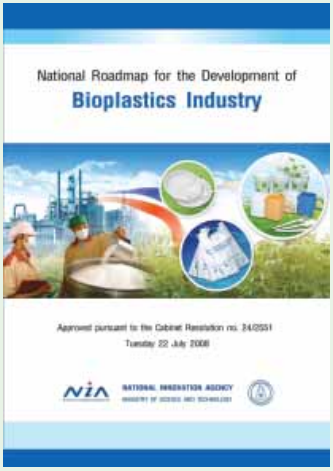
Turnover
- 328 million THB

Employees
- 35

Branches
- Bio-Business
- Energy and Environment
- Design and Branding

Key Materials
- Bioplastics
- Food and herbs

Key Products
- Stimulation of Innovation in Thailand
- Implementation of Bioplastic Road Map



National Roadmap for the Development of Bioplastics Industry.

Agency

The National Innovation Agency (NIA) was established by the Ministry of Science and Technology on October 1st, 2003. From September 1, 2009 onwards, NIA became a public organization under the umbrella of the Ministry of Science and Technology and operates under the supervision and policy guidance of the National Innovation Board. NIA has the national mandate to undertake a broad-based and systematic approach in building up the national innovation system, by fostering strategic innovation, which enhances national productivity, impacting the economic restructure and social development as well as and increasing national competitiveness. NIA recognizes Bioplastics as one of the most important strategic innovation.

In 2006, the Thai government declared the bioplastics industry as one of the "New Wave Industries" that was strategically important to the development of the country.

Thailand's emerging bioplastics industry has great potential because the local sector has a number of strong comparative advantages. First and foremost, Thailand has abundant supply biomass and raw materials that can be used as feedstock for bioplastics production, in particular, cassava. It is the world's largest cassava exporter, producing 27 million tons of fresh cassava roots in as well as the world leading sugar producer, producing 70 million tons of sugar cane in 2009. This abundance translates into lower costs and higher availability of raw materials for the bioplastics industry. n addition, Thailand already has a well established plastics industry – with 3,000 factories producing a wide range of products for overseas customers. It is the number one plastics exporter in ASEAN and the eighth largest plastics exporter in the world. The bioplastics sector can tap on the capabilities, network and resources of this existing industry to rapidly grow and develop.

The national roadmap was drawn up and subsequently approved by the Thai Cabinet in July 2008. The Cabinet also assigned the National Innovation Board of the NIA to oversee the implementation of the roadmap and allocated a budget of 1.8 billion baht for its five-year plan (2008–2012). It outlines four major strategies, namely:

- creating sufficient supply of agricultural raw materials as bioplastic feedstock
- developing new technologies through supporting the strategic research and development
- building new and innovative businesses
- establishing a robust supportive infrastructure including supportive policy and standard and testing

NIA's Role in Development of Bioplastics Industry in Thailand

The Bioplastics roadmap also calls for the integration and close cooperation of the government, the private sector and the research community. Since the implementation of the roadmap, various support programs, incentives, initiatives and infrastructure have been put in place in order to create a conducive environment that encourages investment, commerce creation and innovation. The end goal is to enable Thailand to establish a commercially viable and sustainable bioplastics industry which can compete on the international stage. Some of the implementation activities include:

- creation of the Research and Innovation Helix Program for Bioplastics which provides funding for 89 industrially targeted research projects
- establishment of the Thai Bioplastics Industry Association (TBIA) which has now 50 members
- provision of technical and financial support to Thai companies to undertake 22 innovation projects in bioplastics
- development of Thai industrial standards for compostable plastics and bio-based plastics by the Thai Industrial Standards Institute
- establishment of testing laboratories for biodegradable plastics by the National Metal and Materials Technology Center and the Thailand Institute of Scientific and Technological Research
- introduction of the highest tax incentives for the bioplastics industry by the Board of Investment
- close cooperation with other international bioplastic organizations including German Technical Cooperation (GTZ), European Bioplastics (EuBP), Japan BioPlastics Association (JBPA), Korean BioPlastics Association (KBPA) and Environmentally Biodegradable Polymer Association Taiwan (EBPA)
- organization of the 3 international bioplastic conferences and exhibitions for every 2 years as InnoBioplast2006 to 2010

NIA as Thailand's Bioplastics Focal Point

In order to create the global market and business opportunities for Bioplastics in Thailand, NIA is ready to support local and international partners from both industry and academic followings:

- provide information of suppliers of bioplastic products from TBIA members
- introduce potential business and research partners
- facilitate essential guidelines on investment incentives, market opportunities and regulatory framework
- update the progress of Thailand's Bioplastics Roadmap

The importance Bioplastics web sites in Thailand:
www.nia.or.th/bioplastics
www.tbia.or.th/home.php
www.bioplasticthailand.com

Tappy – The mascot of innoBioPlast event, inspired from tapioca.

Contact

National Innovation Agency (NIA)
Rama VI Road
10400 Bangkok
Thailand

Phone: +66 2 644 6000 ext 103
info@nia.or.th
www.nia.or.th

Contact Person

Dr. rer. nat. Wantanee Chongkum
wantanee@nia.or.th

NNFCC

Foundation
- 2003

Branches
- Bioplastics
- Renewable packaging
- Life cycle assessment
- Labelling
- End-of-life options
- Consultancy

Agency

The NNFCC is the UK's National Centre for Biorenewable Energy, Fuels and Materials. We are committed to the sustainable development of markets for biorenewable products. We promote the benefits of biorenewable energy, fuels and materials for enhancement of the bioeconomy, environment and society.

The NNFCC has earned a unique position and reputation as the UK's leading authority in biorenewable technologies and their applications. Our commercial services have been tailored to assist organisations in understanding the opportunities and overcoming the challenges presented by the emerging biorenewables sector.

The NNFCC works at the forefront of the emerging field of bio-based energy and its intrinsic connection with chemicals and materials. We have an excellent track record in the development of the market because of our relationships with Industry, Government and Research Institutions, providing tangible benefits to everyone in the sector.

We are focused on providing knowledge along supply chains and across biomass based sectors. Our core services are analysis and assessment of technology development and intellectual property, supply chain dynamics, market development and opportunities, feedstock availability and sustainability as well as end of life options.

If you want to develop bioplastics in the UK, talk to us first:
- European Bioplastics CEBON member
- Joint development of UK Home Composting logo and test method
- Facilitator for UK Renewable Packaging Group
- Helped setup supply chain for bio-based packaging to London Olympics
- Steering group on Defra projects on Oxodegradables and Bioplastics

Contact

NNFCC
Biocentre, York Science Park
Innovation Way
Heslington, York, YO10 5DG
United Kingdom

Phone: +44 (0)1904 435182
Fax: +44 (0)1904 435345
enquiries@nnfcc.co.uk
www.nnfcc.co.uk

Contact Person

Dr. John Williams
Head of Materials for Energy and Industry

ONTARIO BIOAUTO COUNCIL

Council

The Ontario BioAuto Council, headquartered in Guelph, Canada, is an industry-led, not-for-profit organization established in 2007 to link chemicals, plastics, manufacturing, auto parts and automotive assemblers with agriculture and forestry.

The Council's membership includes large Canadian auto parts companies who manufacture and sell products around the world. Foreign membership is attracted from multi-national industrial biotechnology, chemical and agri-business companies wanting to partner with Ontario's manufacturing sector to develop global markets for biobased products.

The Council also links industry with leading universities and provincial and international centres of research excellence in bioplastics and biocomposites. Auto21, The National Research Council of Canada and FP Innovations are a few of the important research links.

The Ontario BioAuto Council established a Commercialization Fund in 2007 with initial start-up funding of $ 6 million from the Province of Ontario. The fund helps to diminish the risk for companies commercializing biobased products and processes using emerging green technologies (e.g. biotechnology, nanotechnology, green chemistry and material science). Funding is eligible to Ontario-based startups, small and medium enterprises and multi-national companies who typically partner with international biopolymer and biochemical suppliers in the product and market development process.

The initiatives of the Council and its Commercialization Fund focus on four major priorities:

- Improving the global competitiveness of Ontario's manufacturing sector – by developing new products that can better compete on price, performance and environmental footprint.
- Reducing greenhouse gas emissions – by using renewable-based bioplastics, biochemicals and high performance natural fibre composite materials that can reduce vehicle weight and improve recyclability.
- Reducing the use of toxic chemicals in production processes and consumer products.
- Increase market demand for bioplastics and biochemicals across industry sectors.

The Council also establishes partnerships between Ontario's global automotive and manufacturing sectors and similar sectors in the US, Europe, Brazil and Japan. Through these partnerships it hopes to accelerate the commercialization of new technologies and build global market demand.

Contact

Ontario BioAuto Council
100 Stone Road West, Suite #205
N1G 5L3 Guelph, Ontario
Canada

Phone: +519 827–1118
info@bioautocouncil.com
www.bioautocouncil.com

Contact Person

Vicki Leith
vleith@bioautcouncil.com

SPI BIOPLASTICS COUNCIL (BPC)

Foundation
- 2008

Employees
- 2

Branches
- Comprehensive bioplastics value chain

Key Materials
- Plastic that is biodegradable, has bio-based content, or both

Contact

SPI Bioplastics Council
1667 K St. NW, Suite 1000
Washington, DC 20006
USA

Phone: +1 202 974–5200
mhockstad@plasticsindustry.org
www.bioplasticscouncil.org

Contact Person

Melissa Hockstad

bioplastics council
a special interest group of spi

Council

The SPI Bioplastics Council (BPC), a special interest group of SPI: The Plastics Industry Trade Association, was launched in 2008 to promote the development of bioplastics as an integral part of the plastics industry in the United States.

The BPC's mission is to:
- Educate the plastics industry, government and value chain.
- Articulate clear and consistent descriptions of the different bioplastics options.
- Provide strategic advice to the plastics industry, government and the value chain and promote harmonization of environmental policies.

Member benefits include:
- Influencing bioplastics policies and practices for the industry.
- Monitoring federal, state and local legislation impacting the bioplastics industry.
- Working with government agencies and organizations to harmonize policies and practices that might impact the bioplastics industry.
- Networking and connecting with other leaders in the bioplastics industry.
- Working collectively to grow the bioplastics industry.
- Educating the plastics industry, government and value chain about bioplastics.
- Developing guides on bioplastics terminology, industry statistics and others.
- Joining the Council's committees and subcommittees and setting direction for the Council.
- Participating in meetings and gaining insight from guest speakers on current bioplastics issues.

Membership is open to companies that manufacture bioplastics resins or additives, distribute bioplastics, process bioplastics or manufacture bioplastics equipment and are actively engaged in the U.S., Canada and/or Mexico.

For more information about the Bioplastics Council and its activities or to join, please go to www.bioplasticscouncil.org.

Ecoflex Film. Picture: courtesy of BASF.

Mirel Soil Wrap. Picture: courtesy of Telles.

Thai Bioplastics Industry Association (TBIA)

With strong support from the National Innovation Agency (NIA), the Thai Bioplastics Industry Association (TBIA) was founded on the May 22nd, 2007.

TBIA Vision Thailand to be a regional leader for the commercial application and development of bioplastics, contributing to environmental protection by better waste and GHG emission management.

TBIA Mission TBIA strives to be a regional leader in bioplastics, in which the stakeholders work together in an open and collaborative manner and support the industry through:

- Encouragement of investment in bioplastics industry
- Creation of public awareness on bioplastics
- Development information on markets and technologies as a center of knowledge
- Facilitation of conformity with global standards on bioplastics by testing and certification
- Promotion of networking among members, academic & research bodies and international organizations in bioplastics
- Advocacy with government in policies and strategies supporting bioplastics industry

A Bioplastics Hub for ASEAN: Thailand's Innovative Opportunity Thailand is a major exporter of key agricultural products including cassava, rice, sugar and rubber. It is interesting to note that glucose can be produced at a highly competitive price in Thailand because the raw materials, particularly cassava roots, are in plentiful supply estimated about 27 million tones per year. Potentially this productivity could be still further increased. Additionally, the cost of glucose production from cassava costs could be reduced with the state-of-art anzyme technology in the near future. Low production cost for a basic feedstock creates a major opportunity for Thailand to establish production bioplastics resins using glucose from cassava as raw materials.
Futhermore, Thailand has a strong downstream industrial demand to absorb production of biodegradable bioplastic, e.g. plastic bags, food packaging, agricultural films as well as engineering parts for the automotive and electrical industries.
In order to assess Thailand's potential for producing biodegradable plastics from cassava; a feasibility study, initiated by the National Innovation Agency (NIA), was conducted by Stern Stewart and Co. sponsored by Sanguan Wongse Industries Co. Ltd, which is a leader in production of modified starch from cassava. This study showed that cassava starch as a feedstock for the Thai bioplastic industry was 30% cheaper than US corn starch. Also, construction and manufacturing costs in Thailand would be 30% cheaper than in more developed countries.
Therefore NIA proposed to establish Thailand as the "Bioplastics Hub for ASEAN", firstly by supporting concerned industry sectors in technology acquisition, technology licensing, joint investment, R&D coordination, market development and human resource development. The first successful step is to support the recent establishment of an industry grouping, the "Thai Bioplastics Industry Association (TBIA)"

THAI BIOPLASTICS INDUSTRY ASSOCIATION (TBIA)

Foundation
- 2007

Members
- 50

Branches
- Bio-Business, Energy and Environment

Key Materials
- Bioplastics

Key Products / Services
- Stimulation of Bioplastics Innovation in Thailand
- Implementation of Bioplastics Industry

Contact

Thai Bioplastics Industry Association (TBIA)
Rama VI Road
10400 Bangkok
Thailand

Phone: +66 2 644 6000 ext 120
info@tbia.or.th
www.tbia.or.th

Contact Person

Somsak Borrisuttanakul
somsak@tpbi.co.th

VHI

Foundation
- VHI – 1920
- Working Group WPC – 2005

Branches
- Particleboards
- Fibreboards
- Plywood
- Wood Polymer Composites
- Internal doors

Key Products
- Terrace flooring
- Facade profiles
- Window sills and others

Contact

Verband der Deutschen Holzwerkstoffindustrie e.V. (VHI)
Ursulum 18
35396 Gießen
Germany

Phone: +49 (0)641 97547–0
Fax: +49 (0)641 97547–99
vhimail@vhi.de
www.vhi.de

Contact Persons

Dr. Peter Sauerwein
Executive Director

Association

The Association of the German Wood-Based Panel Industries (VHI) represents the common interests of manufacturers of particleboards and fibreboards, plywood, wood polymer composites and internal doors to the public, the government bodies and other economic sectors in Germany and abroad.

The latest professional group under the roof of the VHI is working on wood polymer composites. Leading Central European manufacturers of this new material joined the VHI in 2005 to primarily coordinate the research on wood polymer composites, to initiate research, to facilitate the market entry of WPC-products by means of marketing and to create a quality seal.

Material

VHI's specific fields of activity are inter alia:
- Support of the business forums "particleboards and fibreboards", "plywood", "wood polymer composites" and "internal doors" as well as of the committees for "technology" and "raw materials".
- Consulting on the fields of economy, technology and politics
- Initiation of research projects and market studies
- Specialist statements regarding European and national draft guidelines, -laws and -regulations
- Representation of branches in committees of public bodies, research institutions, national and European standardization bodies, professional associations and other relevant institutions
- Industry oriented public relations and marketing

Products

The German wood-based panels and inner door industry produces an annual turnover of 5,2 bn Euro (2009) with 21000 employees. The production amounts to 6,6 mill. cbm of particleboards, 1,1 mill. cbm of OSB (Oriented Strand Board), 3,8 mill. cbm of fibreboards as well as 130.000 cbm of plywood and about 5,8 mill. internal doors.

WOODFIBER PLASTIC COMPOSITES COMMITTEE (WPCC)

Association

Woodfiber Plastic Composite Committee (WPCC) is a subordinate organization of China Plastic Processing Industry Association (CPPIA). WPCCCPPIA is a professional, non-profit, self-discipline voluntary organization. The entire team and industry will pull together to make WPC into a well functioning, seamless Chinese organization for the sake of a better world tomorrow.

To develop a strong link within our industry and a close link with the Chinese government for enhancing a rapid growth of the industry.

The members of WPCC-CPPIA include people from relevant WPC business such as raw material suppliers, trading companies, plastic scraps recyclers, mechanical providers, WPC manufacturers, scientists and R&D groups.

Service

1. Promotion-To promote the relevant government policies and regulations, provide feedback from the industry to the authorities concerned.

2. Surveillance-To encourage self-regulating among the members, formulate industrial standards and trading codes and expedite industry certification.

3. Strengthen-To strengthen further development, recruit more members to sustain financial support for the organization.

4. Servicing-To provide better service to our members, which includes the promotion of new raw materials, technology improvement and equipments updated, specially for energy saving technology and equipments; provide consultant service and technical supports, such as copyright application, technical improvement projects; Give suggestive solutions to our member difficulties.

5. Overseas activities-To organize overseas visit and attend international conferences.

6. IT Support-To provide IT services to our members, and build a professional WPC website.

Contact

Woodfiber Plastic Composites Committee (WPCC)

Phone: 86 755–8364 3303
Fax: 86 755–8364 3292
wpcc_cppia@yahoo.cn
www.wpc.cn

All information on international congresses along with information services of the nova-Institute on bio-based economy – green chemistry and bio-based products:

www.bio-based.eu

R&D and Consultants

AGROTECH

Foundation
- 2007

Budget / Turnover
- 11.5 million €

Employees
- 87

Branches
- Consulting
- R&D in agritechnology and foodinnovation

Key Materials
- Bio-based plastics and natural fibres for multiple applications

Key Products / Services
- Impartial consultancy and technological services

Contact

AgroTech –
Institute for Agri Technology and Food Innovation
Agro Food Park 15
8200 Aarhus
Denmark

Phone: +45 (0)8743 8400
info@agrotech.dk
agrotech.dk/en

Contact Person

Bodil E. Pallesen
bdp@agrotech.dk

AgroTech

Company

Agriculture provides the industry with numerous biomass-resources for multiple applications such as packaging, car composites, insulation, building materials and lots of other products. Bio-materials and bio-plastics become more and more a part of a sustainable solution in the industry.
AgroTech is an authorized technological service institute which offers impartial consultancy and provides technological services within the fields of the agriculture, horticulture and food industry. AgroTech focus on sustainable commercial production of food and other bio-based products and operates within the intersection between agriculture, horticulture and the industry creating business development through knowledge and innovation. We specialize in providing cutting edge knowledge of biology and technology. The expertise covers all links in the value-chain from field to fork, and the company is directed to suppliers of machinery, facilities and technology used in the primary production as well as food businesses. One of our core business areas is biomass for bio-energy and bio-material purposes such as bio-composites and building materials.

Service

Biomass possesses a range of basic components with interesting technical properties which can be used in multiple applications and often substitute unwanted materials being hazardous to health. New bio-products combine the demands for a positive climate print, being biodegradable, and feature lots of environmental beneficial properties.

Products

AgroTech supports companies in product development with bio-based materials in multiple applications and assist in business and market development. AgroTech participate in research and development projects towards new and unknown materials from biomass and conversion of biomass and join biomass and bio-plastic networks.
We carry out quantitative impact study on biomass resources from the agricultural sector and the Aquarius sector. We complete tests, development and demonstrations within agricultural technology, biomaterials and bioprocess technology, environmental, and energy technology, the area of domestic animals and food technology and technology within the greenhouse industry.

Left to right: Hemp fibre bounded with PLA-fiber a growth medium for spicy herbs, nonwoven hemp fibre mats, reinforced bio-composite. Pictures: Bodil Pallesen.

ASTA EDER
Composites Consulting

Company

Asta Eder Composite Consulting (AECC) is located in Vienna, Austria. The founder studied forestry in Austria and did her PhD on market opportunities of innovative wood based composites in the German speaking area. AECC have experienced and accepted experts, well linked in the worldwide networks of the composites. The services are provided in German, English and Finnish. This set-up gives AECC optimal position for worldwide consulting with special focus on Europe.

Service

Market knowledge for new product development of composites You want to meet the needs of your future customers? To help you to hear the unspoken requests of the customers we offer special know-how of market research tools to guarantee the success of your product launch already during the product development. We offer you reliable reports based on idea workshops, face-to-face and online-interviews, online-research; lead user analysis as well as conjoint analysis.

Consulting for composite product launch New raw materials/composites need to be launched in the B-to-B market with respect to value-chain concept. We offer expertise of the value chains of the wood working and composite industry and in threats and challenges these industries are facing. You are benefiting from:

- broad contacts in composite industries and their markets
- our know-how of innovative composite products (especially Wood Plastic Composites, modified wood, light-weight boards, and bio panels) and their markets (decking, flooring, furniture, door and window markets etc.)

Consulting for composite marketing and sales Does your composite product need a special marketing mix (product, price, promotion, and distribution)? We offer support to implement these key success drivers. Does your excellent novel composite product have a need for solid marketing and sales strategies? We offer long term market knowledge of the needs and requirements for the raw materials of the production processes of furniture, board, composite and construction industry to give you a solid data base for your decision making in B-to-B markets.

We offer comprehensive market competence for composites from raw materials up to end products.



Left to right: Wood Plastic Composite granules, composite cup, composite and timber decking profiles. Pictures: www.burgerfoto.com

ASTA EDER COMPOSITES CONSULTING

Foundation

- 2011

Branches

- All involved in the development and production of composites

Key Materials

- Composites based on bio-based materials and polymers (e.g. WPC)

Key Products/Services

- Consulting for composite materials: product development and launch, marketing and sales

Contact

Asta Eder
Composites Consulting
Stolzenthalergasse 16/16
1080 Vienna
Austria

Phone: +43 (0)676 3631455
asta.eder@wpc-consulting.eu
www.wpc-consulting.eu

Contact Person

Asta Eder
PhD

POLYMEDIA PUBLISHER GMBH

Foundation
- 2006

Branches
- Plastics Industry
- Packaging Industry
- Automotive Industry
- Consumer Electronics
- All Industries
- Academia
- Politicians

Key Materials
- Bio-based Plastics
- Biodegradable Plastics

Key Products
- Bioplastics MAGAZINE
- Conferences
- Consulting

Contact

Polymedia Publisher GmbH
Dammer Str. 112
41066 Mönchengladbach
Germany

Phone: +49 (0)2161 664 864
mt@bioplasticsmagazine.de
www.bioplasticsmagazine.de

Contact Person

Dr. Michael Thielen

bioplastics MAGAZINE.COM

Product

Five years of bioplastics magazine! This success proves that there is a real need for a trade magazine dedicated exclusively to bioplastics, i.e. plastics from renewable resources and biodegradable plastics including natural fibres. bioplastics MAGAZINE covers all topics of these bio-based plastics and biodegradable plastics, many of which fulfilling both aspects.

The magazine keeps its readers updated about the different bioplastic resins which are available and will come up in future, about chemistry, properties and availability. bioplastics MAGAZINE covers the processing techniques of these fascinating materials such as film blowing, extrusion, thermoforming, blow moulding, injection moulding etc. A large part in bioplastics MAGAZINE is dedicated to current and future applications. As of today, the lions share are packaging applications, but other industries are following. Even producers of consumer products such as covers for cellphones, laptop-computers or toys are interested in this family of materials as well as the automotive industry and many others – or they are already using bioplastics in certain products. Another quite important aspect is the political situation. bioplastics MAGAZINE reports about frame conditions, regulations, or the certification of “compostable plastics” according for example to the European standard EN 13432, the oxo-degradable discussion and all end-of-life options. bioplastics MAGAZINE is THE information platform for all parties involved.

It is read by decision makers in all parts of this business, e.g. the raw material suppliers and compounders, machine and mould makers, converters, brand owners, the complete trade chain (wholesale and retail) as well as scientists and politicians, as bioplastics MAGAZINE is an independant and neutral source of information. With an average print run of 5,000 (depending on large events like exhibitions or conferences) the estimated number of readers is much bigger, as many copies of bioplastics MAGAZINE are circulated or passed on to other interested readers. Since its start in early 2006 bioplastics MAGAZINE has experienced a constant, and very positive, feedback from its readers. The number of registered readers is continuously increasing.

The 1st and 2nd PLA Bottle Conference (2007, Hamburg and 2009 Munich) as well as the 1st PLA World Congress (2008, Munich), all hosted by bioplastics magazine were great successes. During K’2010, the World’s biggest trade fair for plastics and rubber, bioplastics magazine organized three very successful “Bioplastics Business Breakfasts”.

The print magazine is published 6 times a year in English language. Subscribers get bioplastics MAGAZINE on their desk for EUR 149.00. This also includes access to the online archive with full-search functionality over all published issues.

Fraunhofer IAP

Institute

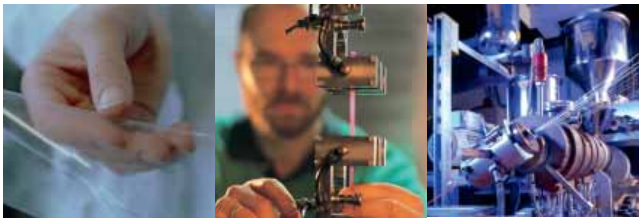
Much more than plastics

The Fraunhofer Institute for Applied Polymer Research IAP Polymers are omnipresent in everyday life in the form of fibers, films, or molded parts, as well as high performance materials in countless special applications. First and foremost polymers synthesized from fossil oil, but increasingly also biopolymers from renewable raw materials, find their applications. At the Fraunhofer IAP both classes of polymers are dealt with for decades and experience from both sides are combined in everyday research. Working areas cover the synthesis of novel polymers, derivatization of existing biopolymers, chemical analytics, physical and structure characterization, and processing into fibers, films and molded bodies. Companies and partners are supported in finding customized solutions for developing and optimizing innovative and sustainable materials, processing aids, and processes.

Service

Tailor-made biopolymers – we do research on your behalf Polymers from renewable raw materials are synthesized, modified, characterized, compounded, and processed at Fraunhofer IAP. In the focus of interest are natural polymers such as polysaccharides (e.g. cellulose, starch), lignin, and proteins, as well as bio-based polymers such as polylactic acid (PLA), polyhydroxyalkanoates (PHA), and other bio-based polyesters, polyamides, and epoxies. For creating new polymers either monomers are combined into new polymers and copolymers, or existing bio-polymers – utilizing nature's synthesis work – are chemically modified. By the use of additives, polymeric blend partners, reinforcing fibers and nano-fillers, recipes are developed and processing parameters are determined for each application in question.

Methods for melt and solution processing include film and blown film extrusion, non-woven melt blowing, injection molding, and fiber spinning. In addition to mechanical properties such as stiffness, strength, and impact strength, also thermal properties such as heat distortion temperature, maximum service temperature, and glass transition temperature as well as permeation properties are optimized. For specific applications, e.g. films, bottles, injection molding parts, or fibers, tailor-made bio-based materials can be developed on your behalf.



(left to right): Film made of modified starch, Testing mechanical properties, Compounding thermoplastics with cellulose man-made fibers, © Fraunhofer IAP.

FRAUNHOFER INSTITUTE FOR APPLIED POLYMER RESEARCH IAP

Foundation
- 1992

Budget
- 13 million €

Employees
- 130

Branches
- Biopolymers

Key Materials
- Cellulose, xylan, lignin, starch, PLA, PHA, bio-PA

Key Products / Services
- Chemical analytics
- Solid state characterization (NMR, X-ray, TEM, REM)
- Synthesis and derivatization
- Compounding and recipe development
- Composite development

Contact

Fraunhofer Institute for Applied Polymer Research IAP
Geiselbergstr. 69
14476 Potsdam-Golm
Germany

Phone: +49 (0)331 568–1706
info@iap.fraunhofer.de
www.iap.fraunhofer.de

Contact Person

Dr. Johannes Ganster
johannes.ganster@
iap.fraunhofer.de

FRAUNHOFER UMSICHT

Foundation
- 1992

Employees
- 183

Branches
- Plastic processing industry
- Packaging industry
- Automotive and automotive supplier industry
- Agriculture

Key Materials
- Polymer compounds based on renewable resources
- Functional fillers

Contact

Fraunhofer Institute for Environmental, Safety and Energy Technology UMSICHT
Osterfelder Str. 3
46047 Oberhausen
Germany

Phone: +49 (0)208 8598 1227
Fax: +49 (0)208 8598 1424
www.umsicht.fraunhofer.de

Contact Persons

Business unit
"Renewable Ressources"
Dr. Stephan Kabasci
stephan.kabasci@umsicht.fraunhofer.de
Dipl.-Ing. Thomas Wodke
thomas.wodke@umsicht.fraunhofer.de

Business unit
"Materials and Interaction"
Dipl.-Ing. Jürgen Bertling
juergen.bertling@umsicht.fraunhofer.de
Dipl.-Des. Sabrina Karthaus
sabrina.karthaus@umsicht.fraunhofer.de

Institute

Fraunhofer UMSICHT develops applied and custom-made solutions in the fields of environmental and process engineering, material and energy technology. Assuming a leading position Fraunhofer UMSICHT is committed to sustainable development, environmentally friendly technologies and innovative approaches designed to improve the standard of living and to promote the economies innovative capacity.

R&D Service

Fraunhofer UMSICHT is your competent partner in all phases of development and market introduction of bio-based and bio-inspired materials. Based on our long-term scientific experience we create innovations: from the first project idea over the joint discussion of product requirements, the production of material samples to practical application tests.
For industrial customers or within the scope of public funded projects we offer market research, experimental investigations, material and compound development in the fields of bioplastics, natural fibre composites and modified bio-materials. Our material development is always closely coupled with the optimisation of known and the research on new processing technologies.
A wide range of plastics machinery equipment in laboratory and in industrial scale even enables us to support industrial partners in large scale production implementation. Our integral material optimisation approach includes aspects like sustainability, aesthetics, design and sensory functions and the reference to biological patterns (bionics).

Reference projects

Business unit "Renewable Ressources":
- Injection moulding compounds based on cellulose acetate (Biograde types)
- Extrusion and injection moulding compounds based on polylactid acid (Bioflex types)
- Development of a self adhesive tape from bioplastics
- Disposable cutlery from bioplastics
- Research projects and product developments in the field of foamed maize starch
- Product developments in the field of biodegradable hygienic films
- Development of new bioplastics (polyamides, polyesters)
- Improvement of bioplastics with fibre reinforcement

Some of these bioplastic compounds are sold as standard formulations by the sales partner and licensee FKuR Kunststoff GmbH, Willich.

Business unit „Materials and Interaction":
- WPC-powder-coating from polyamide and 50% beech wood
- High pressure impregnation of bioplastics, native wood, leather and insulation materials
- Leather-thermoplastics composites
- Research on self-healing elastomers following biological models
- Research on tribologically optimised biomimetic polymer surfaces

Fraunhofer WKI

Institute

The main research activities of the Fraunhofer Institute for Wood Research WKI in Braunschweig are the manufacture and improvement of innovative wood-based composite materials such as particleboards, fibreboards and wood-polymer composites (WPC), the development of durable coatings based on renewable resources, measurements of emissions and application of non-destructive techniques for various materials and products. In addition, Fraunhofer WKI is working in the following areas:
Building physics, including natural and artificial weathering, weathering simulations, corrosion protection, evaluation of hygrothermal material properties, and fire safety.

Service

We can produce wood and natural fiber-based composites using various techniques such as extrusion and hot-pressing and determine their mechanical, thermal and physical properties according to your requirements. We have equipment for reducing wood and other lignocellulosics to chip form, for sieving and sorting as well as drying. A laboratory-scale refiner plant with a double disc refiner can be used to produce thermomechanical pulp (TMP) and chemo-thermomechanical pulp (CTMP) from various lignocellulosic materials. Resins and additives can be added to lignocellulosics using blow-line application in our refiner plant. Hollow-core profiles or tapes can be manufactured on a conical, counter-rotating twin-screw extruder (54 mm screw diameter). A parallel, co-rotating compounder, a thermokinetic mixer and a Palltruder (plast agglomerator) can be used to prepare compounds.

Current WPC research projects are:

- Development of an extruded window profile based on a PVC-free WPC formulation
- Use of refiner wood fibres (TMP fibres) for WPC extrusion
- Preparation of polymer blends based on engineering polymers in virgin and recycled forms
- Glueing and liquid coating of WPC profiles

Fraunhofer WKI is an accredited testing laboratory for WPC decking according to the “Qualitätsgemeinschaft Holzwerkstoffe e.V.” in Gießen, Germany.

FRAUNHOFER WKI

Foundation
- 1946

Turnover
- 9.1 million € (2009)

Employees
- 95

Branches
- Wood-based Panels and Wood-Polymer Composites Industry, Coatings, Wood Engineering and Construction, Fire Safety, Emissions

Key Materials
- Wood, Natural fibres, Refiner fibres, Wood-based Panels, Wood-Polymer Composites, Coatings

Key Products / Services
- Wood-based Panels, Wood-Polymer Composites, Coatings

Contact

Fraunhofer Institute for Wood Research, Wilhelm-Klauditz-Institut, WKI
Bienroder Weg 54E
38108 Braunschweig
Germany

Phone: +49 (0)531 2155–0
info@wki.fraunhofer.de
www.wki.fraunhofer.de

Contact Person

Dr. Arne Schirp
arne.schirp@wki.fraunhofer.de

INSTITUT FÜR KUNSTSTOFFTECHNIK

Foundation

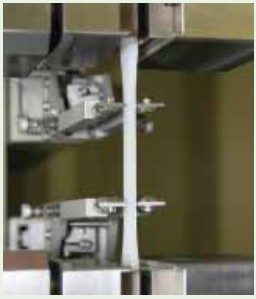
- R&D on the field of Material science, processing and product design of polymers

Employees

- 58

Key Services

- Compounding
- Material characterisation
- Product design
- Processing techniques



Tensile testing machine

Contact

Institut für Kunststofftechnik
Böblingerstr. 70
70199 Stuttgart
Germany

Phone: +49 (0)711 68585317
info@ikt.uni-stuttgart.de
www.ikt.uni-stuttgart.de

Contact Person

Prof. Dr.-Ing. Christian Bonten
Christian.Bonten@ikt.uni-stuttgart.de

IKT
Institut für Kunststofftechnik

Institute

The institute of polymer technology (IKT) of the University of Stuttgart is a R&D-institute active on the fields of material science, processing and product design. Beside the research on conventional polymers, the development of new bio-based polymers and associated processing techniques is a focus of the institute.

The IKT is a comprehensive R&D partner to develop new bio-based materials and to realise new products from those materials. Combining a wide range of processing and characterisation techniques under one umbrella enables the IKT to conduct fast and effective developments for the industry.

Service

- Material development / Compounding (ZSK 25/26/40)
- Processing techniques: Extrusion, injection moulding, injection moulding compounding, film blowing, thermoforming, laser sintering
- Material characterisation: Full range of chemical-, thermal- and mechanical characterisation
- Process simulation: Extrusion-, injection moulding and thermoforming
- Initiation of funded research projects
- Consulting

Twin screw compounder

Injection moulding compounder

Association

The Kunststoff-Institut fuer die mittelstaendische Wirtschaft NRW GmbH (K.I.M.W.) combines tomorrow's scientific know-how with today's production capabilities. Our focus is on increasing the quality and economic efficiency – especially for injection moulded parts made of thermoplasic and thermoset materials. For that reason we offer a number of services for the benefit of our customers.
Our enterprise as a whole has been DIN EN ISO 9001 certified; the laboratory has been accredited to DIN EN ISO/IEC 17025:2000.

The Kunststoff-Institut Luedenscheid

- provides support with the selection, development and optimization of products, moulds and processes in all areas of plastics technology
- is focused on increasing the quality and economic efficiency in the plastics industry
- was founded in 1988 as an extended workbench and is thus one of the most experienced service provider supported by an association of shareholders of approximately 157 companies
- currently employs a staff of approximately 55 people
- generates an annual turnover of more than 5 million euros
- offers trainee- and internships

Service

Our Competences include

- Materialselection / Material testing / Analysis
- Surface technology
- Process engineering and development
- Moulded part and mould optimization
- Joint projects, e.g. Appications of sustainable materials – technical use of bio-based materials

Activities in the field of biopolymers:

- market research – evaluation and supply of information sources, databases or studies, etc.
- material selection with the aid of checklists
- rating the materials with regard to the processing conditions (material preparation, plastication, flow characteristics)
- examination of constructive and mould specific issues
- analysis of material properties (e.g. shrinkage or warpage)
- material tests against the background of specific requirements from different industries – e.g. odourtest, fogging, aging tests (solar simulation, weathering, climate storage)
- implementation of selected surface and decoration processes for the verification of the practicability (varnishing, 3iTech®) and implementation of proper surface characterisations

KIMW GMBH

Foundation
- 1988

Budget
- > 5 million €

Employees
- Approximately 55 people

Branches
- Support in all areas of plastics technology

Key Materials
- Thermoplastic and thermoset materials

Key Products / Services
- Material testing and failure analysis
- Materials Engineering / New Materials
- Surface technology
- Process engineering and development
- Joint projects

Contact

Kunststoff-Institut Lüdenscheid für die mittelständische Wirtschaft NRW GmbH (KIMW GmbH)
Karolinenstr. 8
58507 Lüdenscheid
Germany

Phone: +49 (0)2351 1064 – 191
mail@kunststoff-institut.de
www.kunststoff-institut.de

Contact Persons

Dipl.-Ing. Michael Tesch
tesch@kunststoff-institut.de

Dipl.-Ing. Julia Schmitz
schmitz@kunststoff-institut.de

NOVA-INSTITUT GMBH

Foundation
- 1994

Turnover
- 1.8 million €

Employees
- 20

Customers
- Industry: Automotive, Chemicals, Construction, Plastics, Engineering
- Consulting
- Associations
- Ministries

Key Topics
- Feedstock supply
- Techno-economic evaluation
- Market research
- Dissemination
- Project management
- Policy for a sustainable bio-based economy

Key Services
- Industrial & political consultancy
- Research & development projects
- Conferences & dissemination

nova-Institute for Ecology and Innovation

Bio-based Economy – Green Chemistry and Bio-based Products

The nova-Institute was founded as a private and independent institute in 1994. It is located in the Chemiepark Knapsack in Huerth, which lies at the heart of the chemical industry around Cologne (Germany).

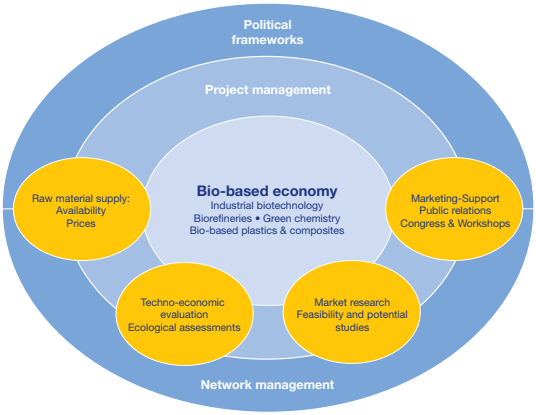
Service

For over 15 years now, the nova-Institute has been globally active in
- feedstock supply
- techno-economic evaluation
- market research
- dissemination
- project management
- policy for a sustainable bio-based economy

With a scientific staff of more than ten experts, nova-Institute has a turnover of approx. 1.8 Mio. €/year which is equally distributed on three sectors: Industrial & political consultancy, research & development projects and conferences & dissemination.

The nova-Institute uses and creates expert knowledge along with innovative solutions to develop and advance the use of Renewable Raw Material (RRM) in Green Chemistry, Industrial Biotechnology and Bio-based Products. In research & development, nova has comprehensive contacts within the wide industrial and scientific network. The communication services include conferences, the news portal for Bio-based Economy incl. a newsletter and the business directory iBIB (more information: www.bio-based.eu).

Key questions regarding nova activities: What are the most promising concepts and applications for Industrial Biotechnology, Biorefineries and Bio-based Products? Which political and economic framework is needed for a sustainable growth of the Bio-based Economy?



www.bio-based.eu

nova-Institut für Ökologie und Innovation

Bio-basierte Ökonomie – Grüne Chemie und Biowerkstoffe

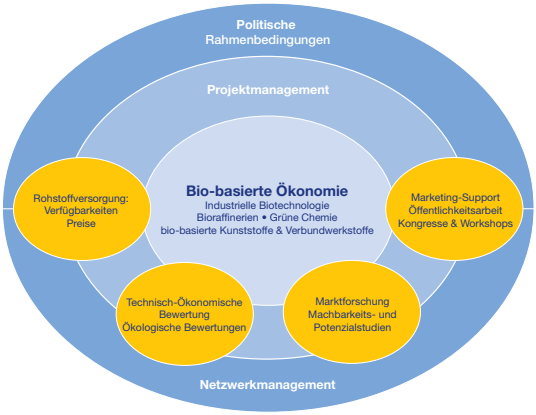
Die nova-Institut GmbH wurde als privates und unabhängiges Institut im Jahr 1994 gegründet und ist im Chemiepark Knapsack in Hürth, Teil des Kölner Chemiegürtels, angesiedelt.

Service

Seit über 15 Jahren arbeitet das nova-Institut weltweit in den Bereichen

- Rohstoffversorgung
- technisch-ökonomische Evaluierung
- Marktforschung
- Öffentlichkeitsarbeit
- Projektmanagement
- Politik für eine nachhaltige bio-basierte Ökonomie

Mit einem wissenschaftlichem Team von mehr als zehn Experten erzielt das nova-Institut einen Umsatz von 1,8 Mio. €/Jahr, der sich anteilsgleich auf folgende Sektoren verteilt: Industrie- und Politikberatung, Forschungs- und Entwicklungsprojekte sowie Kongresse und Öffentlichkeitsarbeit.
Das nova-Institut nutzt und entwickelt Expertenwissen sowie innovative Lösungen, um den Einsatz von nachwachsenden Rohstoffen in der Grünen Chemie, der Industriellen Biotechnologie und bei der Herstellung von Biowerkstoffen zu entwickeln und voranzutreiben. Im Bereich von Forschung und Entwicklung besitzt das Institut weitreichende Kontakte innerhalb der globalen Industrie- und Forschungsnetzwerke. Die Kommunikationsdienstleistungen umfassen Kongressmanagement, ein Fachportal für bio-basierte Ökonomie samt Newsletter, den Biowerkstoff-Report und den Branchenführer iBIB (weitere Informationen: www.bio-based.eu).
Kernfragen der nova-Aktivitäten: Was sind die vielversprechendsten Konzepte und Anwendungen der Industriellen Biotechnologie, von Bioraffinerien und Biowerkstoffen? Welche politischen und ökonomischen Rahmenbedingungen sind notwendig, um ein nachhaltiges Wachstum der bio-basierten Ökonomie zu generieren?



Contact

nova-Institute GmbH
Chemiepark Knapsack
Industriestr. 300
50354 Huerth
Germany

Phone: +49 (0)2233 4814–40
Fax: +49 (0)2233 4814–50
contact@nova-institut.de
www.nova-institut.de/bio

Contact Person

Physicist Michael Carus
Managing Director

KOMPETENZ-ZENTRUM HOLZ

Foundation
- January 2001

Turnover
- 6.5 million €

Employees
- 80

Branches
- Chemical industry
- Wood working industry
- Pulp and Paper industry
- Polymer industry

Key Materials
- Wood and natural fibres
- Cellulose fibres
- Thermoplastics
- Thermosets

Key Products
- Wood Polymer Composites
- Wood Composites
- Man made fibres
- Particle boards, Laminates
- Papers, Paper boards

Contact

Kompetenzzentrum Holz GmbH
Franz Fritsch Str. 11
4600 Wels
Austria

Phone: +43 (0)664 9649800
Fax: +43 (0)7242 2088–1150
r.putz@kplus-wood.at
www.kplus-wood.at

Contact Person

Dr. Robert Putz

Wood K plus

Company

The Kompetenzzentrum Holz GmbH (Wood K plus) is a research service provider for the wood working industry as well as for the polymer- and chemical industry. Innovative timber materials, optimized production processes in the timber production industry and wood chemistry as well as new technologies and products in the field of polymer-composites are the main research objectives of the Competence Center for Wood Composites and Wood Chemistry. The Competence Center demonstrates with its 80 full time employees **one of the most powerful and biggest (wood) research institutes in Central Europe.**

Material

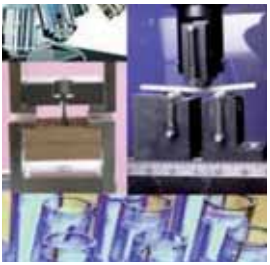
Besides long term projects especially feasibility studies, screening studies, material characterization and contract research are being conducted for partners from the timber-, paper-, furniture-, polymer- and chemical industry.

Especially small and medium sized enterprises very often access to the expertise and know how of the Competence Center. Mainly the solution of technical problems out of the running business, but also the professional handling of orders and projects (funded and not funded projects similarly) represent the main focus therefore.

The division “Wood Polymer Composites” concentrates with its two main research areas Wood-Thermoplastic-Composites (WPC) and Wood-Thermoset-Composites on the knowledge based development of composites from wood particles, wood flour or wood fibres and polymers. The necessary infrastructure for extrusion and injection moulding processes as well as for the mechanical, thermal and physical characterization of composite materials is available. A professional handling of research activities assure the 20 high qualified employees of the division.

Products

The research services of the division “Wood Polymer Composites” range from small testing/characterization jobs over medium term research appointments up to long term research & development projects:
- Raw material analysis
- **Material testing, component testing**
- Material development
- **Extrusion trials**, compounding trials, **injection moulding trials**



Market Analysis & Innovation Research		
	Wood Materials Technology	Wood-Polymer-Composites
	Surface Technology & Logistics	Wood & Cellulose Chemistry

Many thanks to our partners:

www.agrotech.dk
(Denmark)

www.belgianbiopackaging.be
(Belgium)

www.bioautocouncil.com
(Canada)

www.bioplasticsmagazine.com
(Germany)

www.bioplastiques.org
(France)

www.biopreferred.gov
(USA)

www.degradable.org.cn
(China)

www.bpiworld.org
(USA)

www.bioplasticscouncil.org
(USA)

www.biomater.com.br
(Brazil)

www.ecocomp-conference.com
(UK)

www.ecocomposites.net
(UK)

www.europabio.org
(Belgium)

www.european-bioplastics.org
(Germany)

www.iar-pole.com
(France)

www.fnr.de
(Germany)

www.nia.or.th
(Thailand)

www.nnfcc.co.uk
(United Kingdom)

www.tbia.or.th/en
(Thailand)

www.vhi.de
(Germany)

www.wood-kplus.at
(Austria)

www.wpc.cn
(China)

The nova-Institute (www.nova-institut.de/bio) features decisive innovations in the Biomaterials Industry with its innovation award during Congresses. The winners of the years 2007 to 2010 are:

WPC Innovation Award 2007

Category Product

Presented at the Second German WPC Congress (www.wpc-kongress.de/wpc07) on the 4th – 5th of December 2007 in Cologne. The award was sponsored by the Reifenhäuser GmbH & Co. KG Maschinenfabrik (Troisdorf).

1 **Extruded shelf from WPC with patented compression fittings: mehwerk design labor.** A very light shelf of wood chambers with typical woodlike appearance and feel.
www.mehrwerkdesignlabor.de

2 **terraZa: SQUARE-SHAPED, DURABLE, PRACTICAL: WERZALIT GmbH + Co. KG.** WPC injection molding flooring for outdoor use with a patented click system which can be laid safely and quickly.
www.werzalit.de

3 **Flexible interior composite wood: Wacker Polymer Systems GmbH & Co. KG.** The natural wood colour image is preserved due to the low-temperature processing. The bending properties can be adjusted to the range of “stable” to “flexible”.
www.wacker.com

Category Procedure

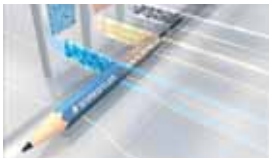
1 **Linear vibration welding for the creation of FibrexTM-links in window-making: Fentech AG.** By the linear motion of two parallel joining areas and the effect of pressure, heat is generated in the joint zone (principle: Rub your hands together). The bonding materials melt. After cooling of the thermoplastic materials, a force-fit connection is created.
www.fentech.ch

2 **Recipe and method of production of WPC from residues of furniture production: Reinü-Fefa Produktions GmbH.** Milling dust from the cutting MDF-machining is processed into various types of WPC compounds and final products such as decks, panels – technical level of properties similar to talc filled standard plastics.
www.fefa.de

3 **Coloured WPC in a rotary sintering process: PHK-Polymer GmbH.** The rotary sintering process “Rotowood” can now allow you not only to process hardwood, but also softwood. Different colored wood particles lead to new design possibilities.
www.phk-polymertechnik.de

WPC-Innovation Award 2009

Awarded at the Third German WPC-Congress (www.wpc-kongress.de/wpc2009), December, 2nd–3rd 2009, Cologne, Germany. The innovation award has been sponsored by Reifenhäuser GmbH & Co. KG Maschinenfabrik (Troisdorf, Germany).



Staedtler Mars & Co. KG: Pencil made of WPC WOPEX® (Wood Pencil Extrusion). The WOPEX pencil shaft is made from a wood plastic composite (WOPEX WPC) with a wood content of 70%. The material consists of fine wood fibre from PEFC-certified German saw mill residue. The pencil lead is made up of appropriate graphites with the addition of very brittle plastics and stearates (soaps) instead of the conventional mixture fired from clay and graphite.
Compared to the production of conventional pencils, the production process is much shorter. In addition, the use of wood as a raw material is much more efficient (for conventional pencils the wood waste is up to 80%) and less energy is required. There are also many benefits for customers: the look and feel is of a high-quality, the writing flow of the pen has a waxy glide which leaves almost no particle residue on the page. Furthermore, it lasts almost twice as long as comparable wood-cased pencils.
www.staedtler.de

H. Hiendl GmbH & Co. KG: Profiles made of Hiendl NFC®. As an alternative to standard metal profiles H. Hiendl GmbH & Co. KG offers a variety of assembly profile systems that are made from the composite material Hiendl NFC® with a wood content of 70%. In comparison to conventional metal systems, the profiles of Hiendl can be continuously extruded in colour.
Because of the high-quality composite material and the greater thickness of the material in comparison to metal profiles, the Hiendl profiles are as robust as conventional solutions. They are compatible with conventional systems and are lower-priced than aluminum profiles.
www.hiendl.de

Qingdao HuaSheng Hi-tech Development Co. Ltd, China: WPC thermal insulated siding. WPC-facing elements: Biofibres based on macromecule interfacing by special processing are compounded with plastics (rexycled PP, ABS and PET) to directly extrude this outdoor siding with smooth surface and tenon. XPS-thermal insulation, long durability, water, wind and snow resistance.
www.qdwpc.com

Next: WPC-Innovation Award 2011

Please apply: Dominik Vogt, Phone: +49 (0) 2233 48–1449, dominik.vogt@nova-institut.de

Biomaterial of the Year 2008

Presented at the International Congress of Raw Material Shift & Biomaterials on the 3rd–4th December 2008, Cologne. The award was sponsored by the Reifenhäuser GmbH & Co. KG Maschinenfabrik (Troisdorf): www.rohstoffwende.de

BIO-PEN: 80% natural ballpoint pen. Overall Winner of the "Biomaterial of the Year 2008": FKuR Kunststoff GmbH & Ritter-Pen GmbH (Brentford). The Bio-Pen by Ritter-Pen consists of 80% of Biograde®, a transparent celluloseacetat made of European softwood. Biograde® not only enables injection moulding effectively but is also easy to print and colour.
www.fkur.de, www.ritter-pen.de

Wood-free tree Product: Men's shoe in BARKTEX with latex: Bark Club Cloth Europe. Bark cloth BARKTEX _Plus-Latex_059 is a rugged, abrasion-resistant, semi-finished product from the bark of the Ficus natalensis ("bark-cloth"), moistened with natural latex of the rubber tree Hevea brasiliensis.
www.barktex.com

NABASCO Natural Fiber Composite for sanitary units: NPSP Composieten BV. Nabasco (Nature Based Composite) is made from natural fibers such as hemp, flax or sisal with thermosets such as polyester or epoxy resin in the RTM process. Reinforced Bio-resins are to be be used in the future. Apart from sinks, the material is used invarious outdoor applications (eviction fibers, radar casings).
www.npsp.nl

Biomaterial of the Year 2009

Presented at the Biomaterials Congress on the 26th–27th of October 2009 in Stuttgart (at the AVK Annual Meeting): www.biowerkstoff-kongress.de. The award was sponsored by the machine manufacturer Coperion GmbH (Stuttgart).

WOPEX® – WPC-pencil: Staedtler Mars GmbH & Co. KG. The pencil shaft is made from a wood-polymer composite (WPC WOPEX) with a wood content of 70%, which is extruded in a coextrusion together with the graphite core and the tactile soft surfaces. The WPC-pencil also has an increased functionality allong with energy and raw materials saving.
www.staedtler.de

BIOSHRINK® – compostable shrink film: alesco GmbH & Co. KG. BIOSHRINK is the world's first compostable shrink film made from renewable raw materials. BIOSHRINK enabled a reliable shrinkage behaviour.
www.alesco.net

Kraftplex® – Wood panel: Well Exhibition Systems GmbH. The versatile material Kraftplex consists of pure wood fiber, but also holds the characteristics of metal, composites, and plastics. It is stable, flexible and permanently malleable like metal sheets.
www.well.de

Biomaterial of the Year 2009

Special Award for R&D

MERIPLAST – a rubber type protein-based Bioplastic: Syral. Meriplast is a particular new bioplastic: An elastomer made from wheat protein with new completely biodegradable material properties.
www.syral.com

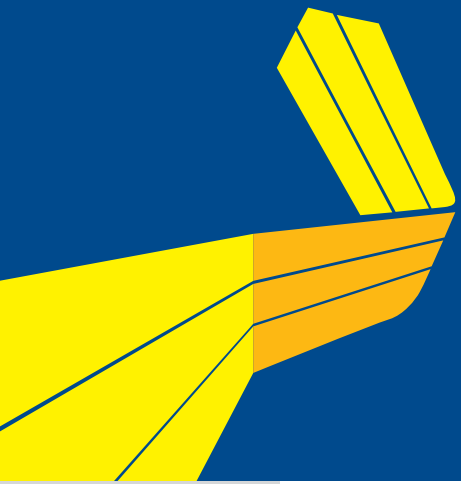
Biomaterial of the Year 2010

Presented at the International Congress on Bio-based Plastics and Composites on the 20th–21st April 2010 at Hannover, Germany: www.biowerkstoff-kongress.de. The award was sponsored by the compounding system manufacturer Coperion GmbH (Stuttgart, Germany).

PROGANIC® – Watering Can: Proper GmbH & Co. KG (Germany). The 100% natural material PROGANIC® is based on three main ingredients: Polyhydroxyalkanoate (PHA), Carnauba Wax and a natural mineral filler. Polyhydroxyalkanoate (PHA) is a biopolymer that is made from bacteria. It can break down naturally and be digested by micro-organisms and is therefore biodegradable. PHA has the same qualities as plastic but it uses renewable raw material such as sugar from crops instead of finite natural resources.
www.proganic.de

GreenGran Natural Fibre Reinforced Granules for Injection Moulding – Bio-Charger: GreenGran B.V. (The Netherlands/China). Using sustainable and renewable natural plant fibres (such as flax, jute, hemp and kenaf) and through industrial production techniques that mix them into plastics; GreenGran's granules are made from a combination of these natural fibres with polypropylene, thus reducing the use of petroleum products. Five times stiffer and 2.5 times stronger than polypropylene, they will not wear and tear the screw and the mould as glass fibres do. Unlike glass fibres, they do not pose safety and health risks and generally show a better energy and CO_2-balance.
www.greengran.com

Arctic (based on PLA) – ECOmfort Correction Roller: Henkel AG & Co. KGaA (Germany). The newly developed and innovative natural 'Arctic' material sets new standards by replacing a highly technical performance plastic with a sustainable renewable material. The new Pritt ECOmfort is the first Correction Roller in the world made from approx. 89% natural plastic (device shells, excluding usable material such as correction tape & inner parts). This results in approximately 60% less CO_2 emissions, compared to a roller made from standard plastic, in terms of the whole lifecycle from production (incl. transportation) until waste disposal (same method e.g. recycling).
www.henkel.de



Messe Düsseldorf GmbH
Postfach 101006
40001 Düsseldorf
Germany
Tel. +49(0)211/4560-01
Fax +49(0)211/4560-668
www.messe-duesseldorf.de

Messe Düsseldorf®

The international business directory iBIB2011 contains (for the first time) information on about

- 70 major companies, associations and R&D organisations from
- 15 countries on 4 continents

Austria
Belgium
Canada
China
Denmark
Finland
France
Germany
Luxembourg
The Netherlands
Spain
Switzerland
Thailand
United Kingdom
United States

ISBN 978-3-9812027-4-8