AKUplastics

Your supplier

Sustainable materials

Sustainable materials

Our Profile

Years of experience in the distribution and processing of thermoplastic semi-finished products have made us a major Austrian supplier of complete solutions for the entire processing industry.

From our headquarters near Melk on the Danube, we supply and support the domestic market as well as our customers in Western Europe, Hungary and South-East Europe. Our two warehousing branches in the Czech Republic and Slovakia are responsible for their respective markets as well as other Eastern European countries.

Our products are used in the areas of:

- Chemical industry
- Tank and plant construction
- Algae cultivation plant construction
- Semiconductor industry
- Apparatus engineering
- Electrical and electronics industry
- Machine and special machine construction
- Storage, lifting and conveyor technology
- Textile machine construction
- Automotive industry and vehicle construction
- Food industry
- VisCom applications
- Medical technology
- Nuclear technology
- and in many other areas.

A balanced product range, ranging from semi-finished products such as plates, solid and hollow bars, hexagonal bars, flat bars, standard profiles, welding rods and exposed tubes, as well as machined finished parts and ventilation fittings up to processing machines for welding and bending technology clearly underlines this.

By continuously testing and expanding our pool of suppliers, we are able to offer the best quality at fair prices .

As permanent market observation and social changes will require a rethink of solutions in the future, semi-finished products based on biopolymers and regenerates are being produced.

Sustainability I

At Ahlborn Kunststoffe, we regard sustainability as a fundamental pillar of our company.

As a supplier of plastic products, we recognize the responsibility we have towards the environment and future generations.

We have therefore decided to integrate sustainable products into our portfolio.

Reducing the ecological footprint is a key concern.

We are committed to optimizing the use of plastics while minimizing their environmental impact.

We achieve this by promoting recycling products developing innovative materials and improving market acceptance in order to use resources more efficiently.

Sustainability II

Recycling is an essential component for the environment. We actively support the circular economy by selling recycled plastics as products and encouraging our customers to also use recyclable materials.

By reusing plastics, the amount of waste is reduced and natural resources are conserved.

We also offer more sustainable alternatives to conventional plastics in the form of biopolymers.

This takes the form of semi-finished products made from biodegradable materials that can be efficiently recycled or composted at the end of their service life.

Our aim at Ahlborn Kunststoffe is to offer our customers high-quality products.

These should not only meet their requirements, but also make a positive contribution to the environment.

We firmly believe that sustainability and economic success can go hand in hand and are committed to shaping a more sustainable future.

Declaration I

Often in the realm of bioproducts, terms are used that may sound appealing but are not used accurately or honestly. Therefore, we would like to provide explanations for some of these terms to give you a basic understanding of their definitions.

Plastics

are materials made from organic macromolecular compounds (polymers). Their properties depend on their molecular structure and the degree of molecular cross-linking, primarily, rather than their chemical composition.

Typically, plastics are artificial polymers based on petroleum. The development of biodegradable plastics based on renewable resources is still in its early stages.

Plastics are classified based on their physical behavior into:

• Thermoplastics (plastomers): soften when heated and harden when cooled, reversibly deformable

• Thermosetting plastics (duromers): irreversibly hardened products

• Elastomers: rigid but elastic, becoming thermoplastic within certain temperature ranges

Therefore, there can be no "bioplastics," only biopolymers. Plastics, by definition, are petrochemical products that do not have a natural origin like starch, sugar, and others.

1 Vgl. Online im Internet. Url: http://www.inaro.de/Deutsch/ROHSTOFF/industrie/STAERKE/baw.htm

Declaration II

Renewable Resources:

"Renewable resources are agricultural and forestry products that are used in the non-food sector. Renewable resources can be used for materials and energy purposes."

Biodegradable:

"Biodegradable materials exhibit the same decomposition characteristics as naturally occurring organic materials with respect to all of their organic components: they completely break down in a natural biological environment such as a composting facility (aerobic), a biogas plant (anaerobic), soil, and water within the same timeframe as naturally occurring organic materials, leaving no residues except biomass and natural metabolic products. Their assessment is based on appropriate standard test methods (ASTM 5210-92 and ASTM 5338-92)."

Compostable:

"The material must be biodegradable according to the above definition and must be capable of being processed in a composting process. It must be demonstrated that this material can be composted in a composting facility and that the resulting compost can meet national and international requirements. This assessment is carried out through practical model and optimization experiments as well as investigations in practical operations. In particular, there must be no impairment of the compost quality and the utilization properties of the compost."

2 Peterek, G. (1997): Nachwachsende Rohstoffe. Praxis der Naturwissenschaften Biologie. 3 (1997). Köln: Aulis Verlag Deubner & Co Kg . S 1.

3 Vogtmann H.; Gottschall R. (1993): Testmethoden zur Bestimmung der Kompostierbarkeit. In: Hangen H.O. (Hg.) Bioabbaubare Werkstoffe und deren stoffliche Verwertungsmöglichkeiten. ASN, Gütersloh

4 Vogtmann H., Gottschall R.(1993)

Declaration III

Usability of compostable materials:

In this regard, three classes are to be distinguished:

1. Those that may enter composting without special approval.
2. Those that must be specially approved (after passing a certain test grid).
3. Those that, due to certain properties (e.g., pollutant content), are not allowed in the compost fraction.

7 Gottschall R.; u.a. (1993): Kompostierung biologisch abbaubarer Werkstoffe (Anforderungsprofil, Prüfraster, Exemplarische Untersuchung Biopol). In: Hangen H.O. (Hg.) Bioabbaubare Werkstoffe und deren stoffliche Verwertungsmöglichkeiten. ASN, Gütersloh

Circular economy

Key concepts of the circular economy include:

Resource efficiency:
By optimizing the use of materials and resources, consumption is minimized.

Waste prevention:
Reducing waste is central, whether through design changes, improved product lifespan, or reuse.

Reuse and repair:
Products are designed for reuse, and efforts are made to repair defective products rather than discard them.

Recycling:
Materials are recycled to create new products, reducing the need for primary resources.

Circular design:
Products are designed from the outset with the aim of making their components easy to disassemble, recycle, or reuse.

The circular economy aims to create a sustainable economy where resources are used efficiently, environmental impacts are minimized, and long-term prosperity is created for both businesses and society as a whole.

Since 2007, AKUplastics has been promoting this approach and offers biopolymers and regenerates as semi-finished products.

Regenerated plastics

With recycling or regenerated plastics, we aim to take steps to minimize resource consumption and reduce waste by keeping products, materials, and resources in the value cycle for as long as possible.

Instead of following linear "Take-Make-Waste" models, where resources are extracted, processed into products, and eventually disposed of, the circular economy designs and manages products and materials to maximize their lifespan and reintroduce them into the production process after use.

AKU® Regenerate semi-finished products are currently available upon request, primarily as sheets and rods, in the following materials:

- PVDF R
- POM-C R
- PE 1000-R

POM-C Regenerate

Our POM-C Regenerate sheets and rods are made from 100% recycled POM-C.

The continuous service temperature of this engineering plastic is in the range of -40°C to +100°C.

Due to its toughness combined with high dimensional stability, there is generally no tendency for stress cracking.

The POM-C copolymer is characterized by high thermal stability and chemical resistance, especially increased resistance to hydrolysis and many solvents.

This makes it particularly suitable for applications in the food industry, as it can withstand cleaning processes with hot water or various chemicals.

The properties of this regenerated material can be considered equivalent to those of pure POM-C.

PVDF-R Regenerate

All products from the AKU®-FLON PVDF-R line are based on uniform, used, or previously processed plastics that are recycled and transformed into new products.

The AKU®-FLON PVDF-R significantly contributes to reducing waste, resource consumption, and primary energy.

Compared to thermal recycling processes, our method avoids significant amounts of CO2 emissions and unused waste that would otherwise enter the environment.

We already receive support from various industries.

In cooperation with various partners, we have developed an extremely stable and sustainable closed process chain specifically for this project.

Thanks to these efforts, we can offer you not only economic benefits but also sustainable alternatives to new products.

The products of AKU®-FLON PVDF-R undergo the same stringent process and quality controls as new products.

We encourage our customers to choose AKU®-FLON PVDF-R as they adhere to the highest quality standards.

PE 1000-R Regenerate

Our PE 1000-R Regenerate Press Plates offer a sustainable and reliable solution for a variety of applications across different industries.

These press plates are manufactured from high-quality regenerated polyethylene (PE 1000) and are characterized by their durability, versatility, and environmental friendliness.

The use of regenerated polyethylene allows us to reduce plastic waste and actively contribute to promoting a circular economy.

The ultra-high molecular weight polyethylene exhibits high abrasion resistance coupled with high toughness.

Chemical resistance and stress cracking are optimized compared to standard PE-HD. The continuous service temperature ranges from -150°C to +90°C.

PE 1000-R press plates are particularly suitable for applications requiring extreme wear and high mechanical loads, such as in mining, material handling, agriculture, and food processing.

They are chemically resistant and have good weather resistance, making them ideal for outdoor use. PE 1000 press plates provide an extremely robust and long-lasting solution for demanding industrial applications.

- 9.2 – 10.5 million g/mol
- Very high wear and abrasion resistance
- Low friction coefficient, very high notch impact strength

Biopolymers

Due to ongoing market observation and societal changes that will require a rethink in solutions, semi-finished products based on biopolymers are now being produced worldwide for the first time.

This achievement was only possible through the closest collaboration of all industry participants together with our partners.

BIO-AKU® semi-finished products, initially available in the following materials:

- PLA-HI
- CL
- WPC-PP
- PA 6.10

are just the beginning, as we continuously develop further materials for future requirements.

We are taking this path as one of the pioneers in an industry that has so far been dominated exclusively by providers of petrochemical products.

Top-level expertise, combined with the willingness to explore new innovative paths, characterizes this exciting project.

Biopolymers such as PLA-HI, WPC-30PP, and PA 6.10, open up new horizons for sustainable and high-performance plastic solutions.

C-L

***BIO*AKU** C-L is a mixture of cellulose, natural fibers, lignin, and fatty acids.

This material consists of 100% renewable resources and is disposed of similarly to natural wood through decomposition or incineration.

The material is composed of a blend of wood components such as cellulose, natural fibers, lignin, and fatty acids.

This combination gives it a variety of interesting properties that strongly resemble those of natural wood. In comparison to natural wood, it stands out primarily due to its homogeneous structure.

Additionally, the material is biodegradable and has a largely neutral CO2 balance. It also exhibits high mechanical strength.

Properties:

- Thermoplastic based on renewable resources, hence environmentally friendly and neutral in CO2 balance
- Material is biodegradable
- Disposal, e.g., through composting or incineration
- Good mechanical properties
- High stiffness
- Tensile modulus up to 4248 MPa
- Good impact resistance
- Processing comparable to wood
- Isotropic mechanical properties

General Properties	Norm	Unit	Value
1. Density (ρ)	ISO 1183	g/cm³	1.28
2. Water Absorption9)	ISO 62	%	2.5
3. Moisture Absorption9)		-	-
4a. Continuous Use Temperature Upper Limit9)	UL746B	°C	65
4b. Continuous Use Temperature Lower Limit9)			-
Mechanical Properties	**Norm**	**Unit**	**Value**
1. Tensile Strength (σS)		MPa	35
2. Tensile Elongation (εS)	ISO 527	%	1.1
3. Tensile Strength (σR)		MPa	35
4. Tensile Elongation (εR)		%	1.2
5. Impact Strength (an)	ISO 179	kJ/m²	13
6. Notched Impact Strength (ak)9)			2.8
7. Ball Indentation Hardness (Hk) / Rockwell9)	ISO 2039	MPa	-
8. Shore-D	ISO 868		-
9. Flexural Strength (σB 3.5%)9)	ISO 178	MPa	-
10. Modulus of Elasticity (Et)	ISO 527		4250

PLA-HI

***BIO*AKU** PLA-HI sheets are composed of 90% PLA, a bioplastic derived from renewable resources.

They are manufactured under CO2-neutral conditions according to GHG Scope 1+2 standards. These sheets are characterized by their high impact resistance, making them ideal for demanding applications.

They can be mechanically processed with great precision, including:

- Deep drawing
- Forming
- Printing
- Sawing
- Bonding
- Drilling and punching
- Currently available in natural or translucent color variants, they can also be dyed according to customer preferences.

Thickness (mm)	kg/ m
2	2,7
3	4,0
4	5,4

Property	Standard	Unit	Value
Density (ρ)	ISO 1183	g/cm³	1.2
Continuous Use Temperature	UL746B	°C	60
Upper			
Yield Strength (σS)	ISO 527	MPa	46 (49)
Yield Strain (εS)	ISO 527	%	2 (2)
Tensile Strength (σR)	ISO 527	MPa	37 (27)
Tensile Strain (εR)	ISO 527	%	20 (>100)
Impact Strength (an)	ISO 179	kJ/m²	o.B. (o.B.)
Notched Impact Strength (ak)	ISO 179	kJ/m²	67 (25)
Shore-D Hardness	ISO 868		77
Bending Strength (σB 3.5 %)	ISO 178	MPa	87 (81)
Modulus of Elasticity (Et)	ISO 527	MPa	3500 (2960)
Melting Range (Tm)		°C	177
Adhesion			+
Flammability	UL 94		HB
Heat Deflection Temperature (HDT/B)	ISO 75		55-60°C

WPC-PP

***BIO*AKU** WPC-PP is a composite based on polypropylene (PP) and wood fibers. The proportion of renewable raw materials is approximately 70%.

Due to the excellent bonding of the wood fibers to the polymer, ***BIO*AKU** WPC-PP exhibits exceptionally high mechanical strength.

Based on this, technical parts can also be manufactured with WPC-PP. The material is suitable for outdoor use and can be equipped with antibacterial properties. Its processability is comparable to that of wood.

Properties:

- Composite based on renewable raw materials
- (70%) and PP
- High mechanical strength
- Suitable for outdoor use
- Can be equipped with antibacterial properties
- Processability similar to wood

I. General Properties			
1. Density (ρ)	Standard: ISO 1183	Unit: g/cm³	Value: 1.21
2. Water Absorption	Standard: ISO 62	Unit: %	Value: -
3. Moisture Absorption			
4a. Continuous Use Temperature (Upper)	Standard: UL746B	Unit: °C	Value: 85
4b. Continuous Use Temperature (Lower)			
II. Mechanical Properties			
1. Tensile Strength (σS)	Unit: MPa		
2. Elongation at Break (εS)	Standard: ISO 527	Unit: %	Value: -
3. Tear Strength (σR)	Unit: MPa		Value: 30
4. Elongation at Break (εR)	Unit: %		Value: 1.6
5. Impact Strength (an)	Standard: ISO 179	Unit: kJ/m²	Value: 7.7
6. Notched Impact Strength (ak)			
7. Ball Indentation Hardness (Hk) / Rockwell	Standard: ISO 2039	Unit: MPa	
8. Shore-D Hardness	Standard: ISO 868		Value: 75
9. Flexural Strength (σB 3.5%)	Standard: ISO 178	Unit: MPa	
10. Modulus of Elasticity (Et)	Standard: ISO 527		Value: 5180

PA 6.10

***BIO*AKU** PA 6.10 (Polyamide) consists of 60% renewable raw material Sebacic acid, derived from castor oil.

This material combines a relatively low density for polyamide with good impact resistance at low temperatures and is very dimensionally stable due to its low water absorption. Thus, this material can be used not only in traditional PA 6 applications but also where the use of PA 6 has been limited.

Properties:

- Partial basis of renewable raw materials (60%) castor oil
- Low density
- Dimensionally stable
- Lower water absorption than PA 6

I. General Properties	Standard	Unit	Value
1. Density (ρ)	ISO 1183	g/cm³	01. Aug
2. Water Absorption	ISO 62	%	03. Jun
3. Moisture Absorption			01. Apr
4a. Continuous Use Temperature (upper)	UL746B	°C	100
4b. Continuous Use Temperature (lower)			-

II. Mechanical Properties	Standard	Unit	Value
1. Tensile Strength (σS)		Mpa	65
2. Elongation at Break (εS)	ISO 527	%	04. Mai
3. Tensile Strength at Yield (σR)		MPa	-
4. Elongation at Yield (εR)		%	-
5. Impact Strength (an)	ISO 179	kJ/m²	N/A
6. Notched Impact Strength (ak)			5
7. Ball Indentation Hardness (Hk) / Rockwell	ISO 2039	MPa	-
8. Shore-D Hardness	ISO 868		80
9. Flexural Strength (σB 3.5%)	ISO 178	MPa	85
10. Modulus of Elasticity (Et)	ISO 527		2400

Delivery overview

Material designation according to DIN / ISO	PANELS, SHEETS, BLOCKS	+ FOILS SHEETS	ROUND (SOLID) RODS	HEXAGONAL RODS	HOLLOW RODS	PRESSURE & SIGHT PIPES	VENTILATION COMPONENTS	WELDING ADDITIVES	SHAPED PIPES	STANDARD PROFILES
	Standard dimensions (mm)						Additional delivery options			
	Thickness 1)	Thickness 1)	ODØ 2)	LW	ODØ 3)	ODØ 4)	(✓ = available / - = no)			Type of profile
BIO-Polymere div.	-	-	10-40	-	-	-	-	-	-	✓
PVC-U (Hard-PVC)	1-100	-	5-400	10-38	15-230	10-600	✓	✓	✓	U/L/H/T
PVC-HI	3-50	-	20,30,40	-	-	-	-	-	-	-
PVC-ESD	-	-	20,30,50	-	-	-	-	-	-	-
PVC-Hardfoam	1-24	-	-	-	-	-	-	-	-	-
PVC-C	3-30	-	10-150	-	-	16-500	-	✓	-	L
PVC-P (Soft-PVC)	-	2-10	-	-	-	-	-	✓	-	-
PE-HD (PE 300)	2-120	-	10-700	17-38	30-1350	10-1400	✓	✓	✓	U/L
PE-HMW (PE 500)	10-100	-	-	-	-	-	-	-	-	-
PE-UHMW (PE 1000)	3-100	-	20-200	17-38	-	-	-	-	-	-
PP-H	2-120	-	10-700	17-32	30-1350	10-1400	✓	✓	✓	U/L
PPs	3-20	-	20-100	-	-		✓	✓	-	-
PPs-EL	3-20	-	20-80	-	-		-	✓	-	-
PP-GF30	40	-	20-150	17-38	-	-	-	-	-	-
PP-PET-F30	-	-	25-100	-	-	-	-	-	-	-
PP-C	3-15	-	-	-	-	-	-	✓	-	-
PP-R	-	-	-	-	-	-	-	✓	-	-
PP-ESD	-	-	20-110	-	-	-	-	-	-	-
ABS	15-100	-	10-100	-	-	-	-	-	-	-
PET (PETP)	10-80	-	12-200	17-38	-	-	-	-	-	-
PMMA-XT	-	-	4-200	-	-	7-250	-	-	-	-
PMMA-GS	-	-	10-200	-	-	40-500	-	-	-	-
PC	15-50	-	10-180	17-38	-	10-200	-	-	-	-
PPE	10, 20	-	20-80	-	-	-	-	-	-	-
PPE-GF30	-	-	30, 40	-	-	-	-	-	-	-
PA 6 xt	2-100	-	6-300	17-38	20-100	-	-	-	-	-
PA 6.6	10-50	-	6-150	17-38	-	-	-	-	-	-
PA 6 cast	16-100	-	50-320	-	-	-	-	-	-	-
PA 6.6-GF30	10-100	-	20-150	-	-	-	-	-	-	-
POM-C	2-130	-	3-500	17-38	20-200	20-450	-	-	-	-
POM-ESD	12, 20	-	-	-	-	-		-	-	-
POM-ELS	30, 50, 80	-	12, 20, 30	-	-	-	-	-	-	-
POM-PE10	10-50	-	20-100	-	-	-	-	-	-	-
PEEK	8-50	-	5-200	17-38	-	-	-	-	-	-
PEEK mod.	10, 20	-	10-80	-	-	-	-	-	-	-
PEEK-GF30	-	-	10100	-	-	-	-	-	-	-
PES	-	-	12-100	-	-	-	-	-	-	-
PSU	-	-	20-100	-	-	-	-	-	-	-
PPS	-	-	20-50	-	-	-	-	-	-	-
PPS-GF40	-		20-50	-	-	-	-	-	-	-
PPSU	-	-	20-40	-	-	-	-	-	-	-
PEI	-	-	25-100	-	-	-	-	-	-	-
PVDF	2-60	-	10-250	17-38	110-250	16-400	✓	✓	-	-
PVDF-ELS	-	-	20-60	-	-	-	-	-	-	-
ECTFE	1,5/2,3/3	1,5/2,3	25-127	-	-	20-110	✓	✓	-	-
PCTFE	5-30	-	9-125	-	30-430	-	-	-	-	-
FEP	5-30	1,5-2,3	9-125	-	-	32-110	-	✓	-	-
PFA	5-30	1,5-2,3	9-125	-	-	16-32	-	✓	-	-
PTFE-virg.	1-50	0,5-3	4-775	-	10-1440	10-80	-	-	-	-
PTFE-C25	1-50	0,5-3	4-775	-	10-1440	10-80	-	-	-	-
PTFE-GF25	1-50	0,5-3	4-775	-	10-1440	10-80	-	-	-	-

1) Standard formats, 2) Standard length, 3) Inner diameter and length as well as 4) Wall thickness (if applicable, pressure series) and length on request.

Minimum quantities, standard formats, designs, colors, cuttings, and machined parts according to drawing are available on request.
This overview illustrates our delivery options for standard products and does not claim to be complete and accurate.
As a specialist company, we also supply machinery, equipment, and accessories for plastic welding, joining, bending, and folding technology.

Notes

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