NUREL
ENGINEERING POLYMERS

Promyde®
ADVANCED MATERIALS

HIGH PERFORMANCE POLYAMIDES | PRODUCT PORTFOLIO

50 YEARS OF **EXPERTISE** IN **ADVANCED MATERIALS**

- SYNTHETIC FIBERS
- **ENGINEERING POLYMERS**
  - PA6, PA66, PP, PBT, PET, CoPA & **HIGH PERFORMANCE PA**
  - MATERIALS FOR PACKAGING
  - CERTIFIED RECYCLED ENGINEERING COMPOUNDS
- BIOPOLYMERS
- INJECTION SOLUTIONS

NUREL, a leading and highly experienced producer of engineering polymers, is recognized for its strong commitment to **research, innovation and technical excellence**.

Building on decades of expertise in polyamide technology, our **in-house polymerization** together with **state-of-the-art compounding facilities** provide the basis for expanding our PROMYDE®® range and developing new high-performance polyamides solutions.

The new PROMYDE® High Performance Polyamides portfolio goes beyond conventional PA6 and PA66, offering **semi-aromatic**, **long-chain**, **elastomeric** and **transparent polyamides** for injection moulding and extrusion, where **strength**, **stability**, **heat resistance** and **flexibility** are essential.

At NUREL, innovation, technical know-how and sustainability are the foundation driving the future of high-performance polyamides.

OUR R&D CENTER FOR NEW ADVANCED MATERIALS

At NUREL, we operate a **state-of-the-art Innovation Center** fully equipped for the **development** of **advanced materials**. This cutting-edge facility allows us to **accelerate innovation** and deliver **high-performance**, **high-quality materials** tailored to the demanding requirements of **automotive**, **electrical & electronics**, **industrial** and **consumer** applications.

EQUIPMENT

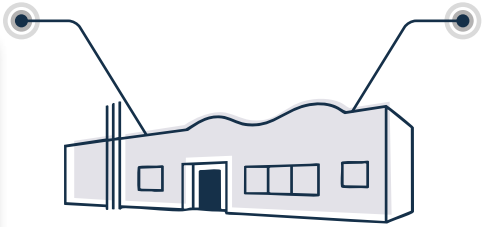
PILOT **POLYMERIZATION** PLANT

2 PILOT SCALE **COMPOUNDING EXTRUDERS**

2 INJECTION MOULDING LINES

CAST & THERMOFORMING PILOT LINE

7-LAYER BLOWN COEXTRUSION LINE



MATERIAL CHARACTERIZATION

PHYSICAL: DENSITY, RELATIVE VISCOSITY, MVR & MFI, MOISTURE & WATER ABSORPTION…

MECHANICAL: TENSILE & FLEXURAL TESTS, IMPACT RESISTANCE, SHORE HARDNESS

FLAMMABILITY: UL 94, GWFI, GWIT

THERMAL: DSC, HDT, THERMAL AGING

OPTICAL: COLOUR AND HAZE

SUSTAINABILITY & CERTIFICATIONS

At NUREL, sustainability is at the core of our Advanced Materials strategy, driving every step from **production** to **certification**.

SUSTAINABLE DEVELOPMENT

NUREL holds **ISO-14001 and ISO-50001** certifications, reflecting our commitment to eco-friendly practices. We focus on **minimizing waste**, **conserving resources** and **improving energy efficiency** in our operations.

LIFE CYCLE ANALYSIS

We assess the **cradle-to-gate impacts** of our products through LCAs, enabling comparison of environmental performance. We conduct **LCAs with SimaPro software**.

RENEWABLE ENERGY

NUREL's photovoltaic plant, one of the largest in Europe with over **28,000 panels**, generates **16,000 MWh** annually and **prevents the emission of 11,000 tons of CO_2** each year.

AVAILABLE CERTIFICATIONS

NUREL holds the **ISCC Plus certification** for its production processes.
This guarantees the **sustainable origin of our products** and reflects our commitment to the circular economy.

RENEWABLE ENERGY MILESTONES

At NUREL, we operate with **100% renewable energy**, **30%** of which comes from our own **self-production**. **SGS has certified** that **all the energy used in our production center comes from renewable sources**, avoiding the **emission of 11,000 tonnes of CO_2** into the atmosphere.

SUSTAINABLE ENERGY MILESTONES

28,310
SOLAR PANELS
Over an area of 93,000 m²

16,560
MWH
Produced per year

11.85
MWP
Total installed capacity

10
MWH
Energy storage

11,000
TONNES
Of CO_2 saved

TOTAL INDEPENDENCE
From conventional electricity sources

HIGH PERFORMANCE POLYAMIDES

With over **60 years of experience** in polymer science and engineering, NUREL combines **in-house polymerization** and **compounding capabilities** to deliver fully integrated solutions. **PROMYDE®** is **NUREL's brand of polyamides**, now extended into the field of **high-performance engineering plastics**.

This new **PROMYDE®Advanced materials portfolio** covers **semi-aromatic, long-chain, elastomeric and amorphous polyamides**, engineered to deliver reliable solutions where conventional engineering plastics reach their limits.

With a wide selection of **reinforced**, **flame-retardant** and **tailor-made formulations**, this new PROMYDE® family ensures **optimised performance across several end uses**.

Promyde®
ADVANCED MATERIALS

PROMYDE® AX & BX SERIES

SEMI-AROMATIC PPA:

Excellent mechanical properties even under high humidity environments, enhanced dimensional stability, reduced warpage and improved surface finish. suitable for applications up to 80 °C.

PROMYDE® HT SERIES

HIGH-TEMPERATURE PA SEMI-AROMATIC PPA:

Excellent mechanical and thermal stability, low moisture absorption. Suitable for use at high continuous temperatures (up to 140 °C).

PROMYDE® LC SERIES

LONG-CHAIN POLYAMIDES:

Combining flexibility, chemical resistance, hydrolysis resistance and low moisture absorption. Low fusion temperature.

PROMYDE® TR

AMORPHOUS TRANSPARENT POLYAMIDES:

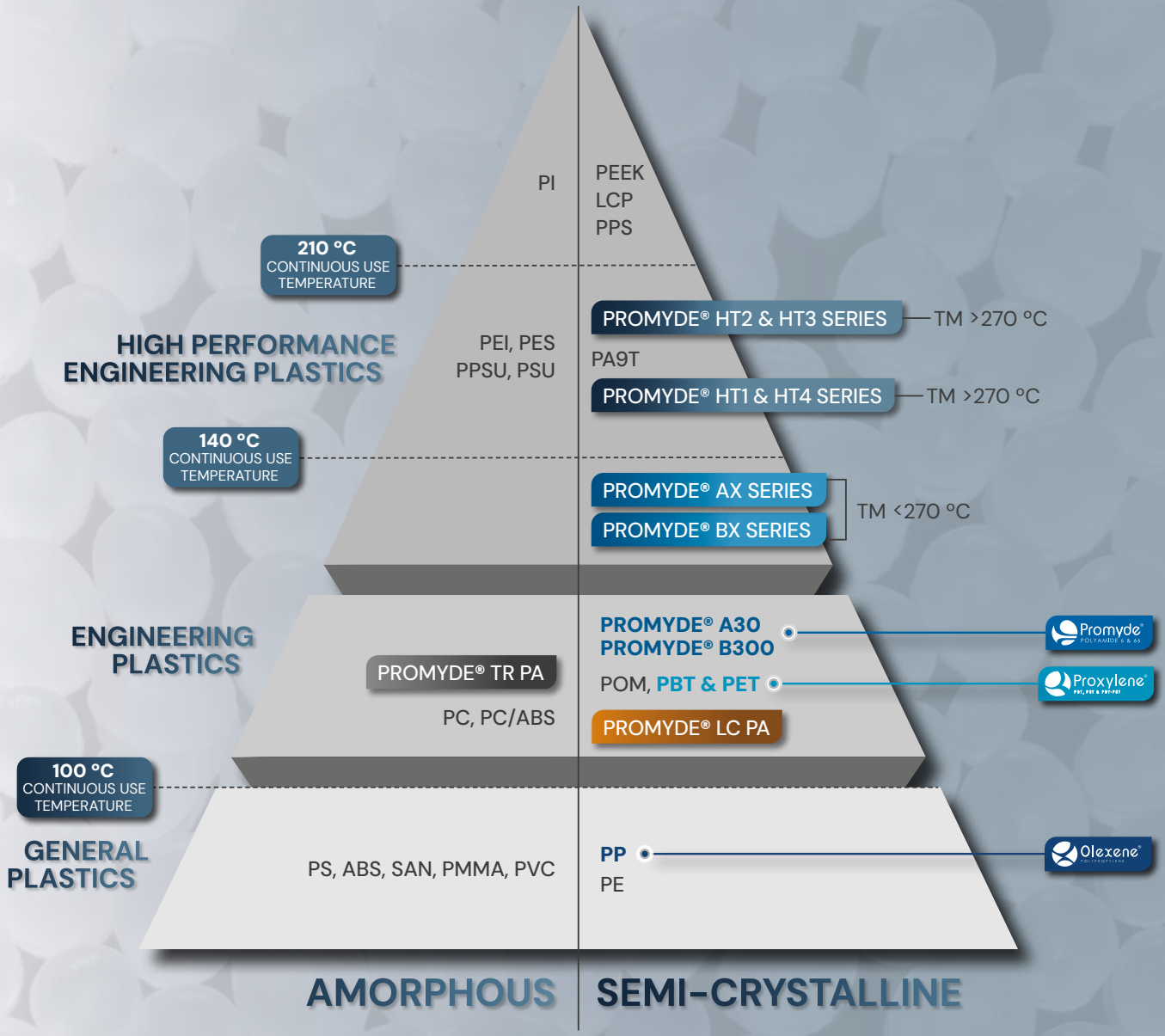
Glass-like clarity with reliable toughness and thermal resistance.

PROMYDE® FLX

PEBA:

Elastomeric polyamides with high resilience, toughness and superior flexibility.

PERFORMANCE HIERARCHY OF NUREL ENGINEERING POLYMERS



PROMYDE® AX AND BX SERIES

SEMI-CRYSTALLINE/SEMI-AROMATIC POLYPHTHALAMIDE COMPOUNDS.

The PROMYDE® **AX and BX series** represent an **upgrade from conventional PA6 and PA66**, combining **improved dimensional stability** and **lower moisture absorption** with **higher stiffness and strength**. These properties result in r**educed warpage, better surface finish** and more **reliable performance** under demanding conditions.

KEY FEATURES

- High modulus and tensile strength, even in conditioned state.
- Excellent dimensional stability, reduced warpage.
- Superior surface finish compared to PA6/PA66.
- Heat deflection temperature (HDT): 200–250°C
- Process temperatures and conditions as standard polyamides (PA6 and PA66).

ADVANTAGES

- Lower moisture absorption and higher HDT than PA6/PA66.
- Better surface aesthetics and dimensional control than standard aliphatic polyamides.
- Mechanical properties do not drop when conditioning.
- Positioned below high-aromatic PPA (HT series) but more cost-effective.

PROCESSING RECOMMENDATIONS

MELTING POINT	PROCESSING TEMPERATURES
AX ≈ 260° C BX ≈ 225° C	<300° C

APPLICATIONS

The AX & BX series offer durable solutions for industries where **heat**, **chemicals** and **precision** are critical, combining **strength**, **dimensional stability** and **resistance** to demanding conditions. In **automotive**, they can **replace metal in under-the-hood parts**, **boosting performance** while **reducing weight**, and in **industrial** uses such as **pumps**, **valves** and **power tools** they ensure **reliable operation** under **hot fluids** and **high temperatures**. Wherever PA6 & PA66 fall short, AX & BX deliver long-lasting, high-performance results.

AX & BX GLASS FIBRE REINFORCED GRADES

PROMYDE® AX & BX glass fibre reinforced grades (30–65% GF) combine high stiffness and strength with low moisture absorption, ensuring excellent dimensional stability and reduced warpage even under humid conditions.

	CONDITIONS	TEST METHOD	UNITS	B300 P2 G60 S BL02	BX300 G60 S BL02	AX30 G60 BL02
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.2	0.9	0.8
Water absorption	23 °C / saturation in water	ISO 62	%	4.5	3.0	2.90
MECHANICAL PROPERTIES						
Tensile modulus	23 °C 1 mm/min	ISO 527-1-2	MPa	21,000 / 15,000	21,000 / 20,000	23,000 / 22,200
Tensile strength	23 °C 50 mm/min	ISO 527-1-2	MPa	260 / 190	240 / 220	270 / 255
Elongation at break	23 °C 50 mm/min	ISO 527-1-2	%	2.0 / 3.0	2.0 / 2.5	2.0 / 2.1
Flexural modulus	23 °C 2 mm/min	ISO 178	MPa	20,000 / 14,000	21,000 / 20,000	22,500 / 21,800
Flexural strength	23 °C 2 mm/min	ISO 178	MPa	405 / 290	400 / 340	450 / 400
THERMAL PROPERTIES						
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	222	222	260

AX & BX CARBON FIBRE REINFORCED GRADES

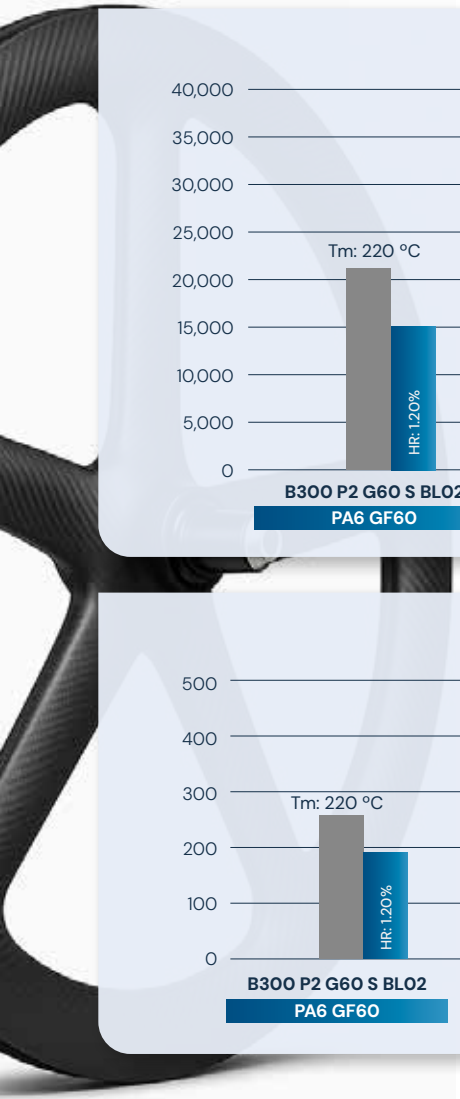
PROMYDE® AX & BX carbon fibre reinforced grades (30–50% CF) deliver maximum modulus and strength with reduced weight, plus improved electrical conductivity for lightweight structural parts and electrostatic dissipation.

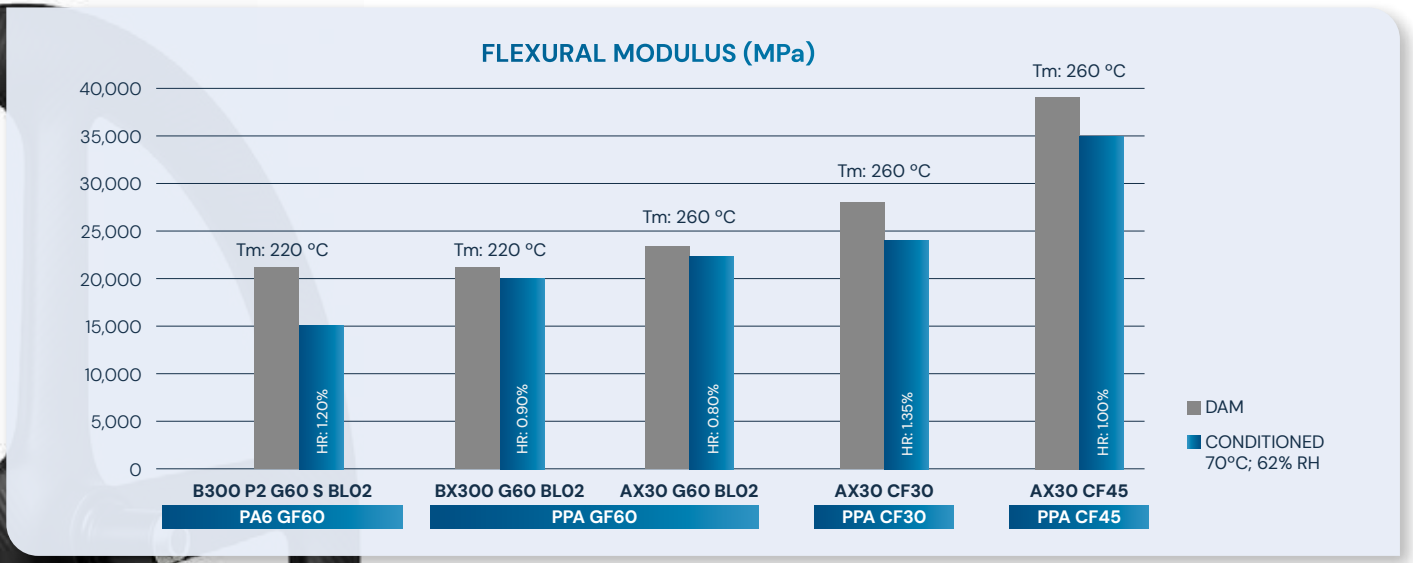
	CONDITIONS	TEST METHOD	UNITS	B300 P 2 G60 S BL02	AX30 CF30	AX30 CF45
Density	23 °C	ISO 1183	g/cm³	1.7	1.3	1.4
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.2	1.3	1.0
MECHANICAL PROPERTIES						
Tensile modulus	23 °C 1 mm/min	ISO 527-1-2	MPa	21,000 / 15,000	28,500 / 23,000	39,000 / 36,000
Tensile strength	23 °C 50 mm/min	ISO 527-1-2	MPa	260 / 190	270 / 230	260 / 240
Elongation at break	23 °C 50 mm/min	ISO 527-1-2	%	2.0 / 3.0	1.5 / 2.0	1.0 / 1.0
Flexural modulus	23 °C 2 mm/min	ISO 178	MPa	20,000 / 14,000	28,000 / 23,000	38,000 / 35,000
Flexural strength	23 °C 2 mm/min	ISO 178	MPa	405 / 290	410 / 360	435 / 390
THERMAL PROPERTIES						
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	222	260	260

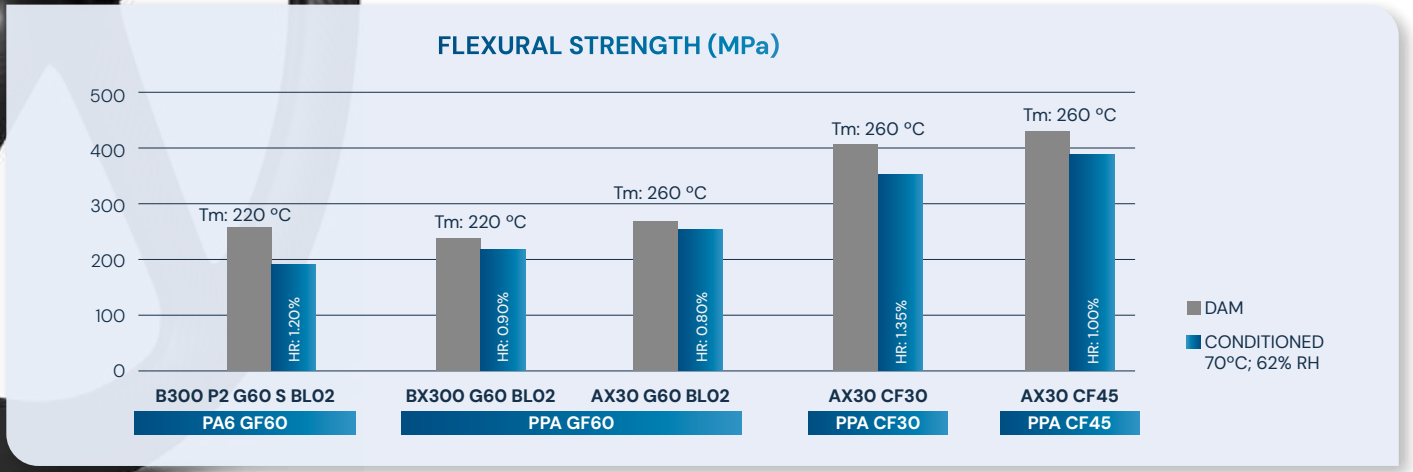
AX & BX CARBON FIBRE REINFORCED GRADES

MECHANICAL PROPERTIES VS WATER UPTAKE

PROMYDE® AX & BX carbon fibre reinforced grades combine the advantages of **semi-aromatic polyamides** with the **stiffness** and **strength** of **carbon fibres**. Thanks to their **low moisture uptake**, **key mechanical properties** such as **modulus** and **tensile strength** remain stable even in **humid conditions**, ensuring **reliable performance** where **dimensional accuracy** and **long-term integrity** are required.



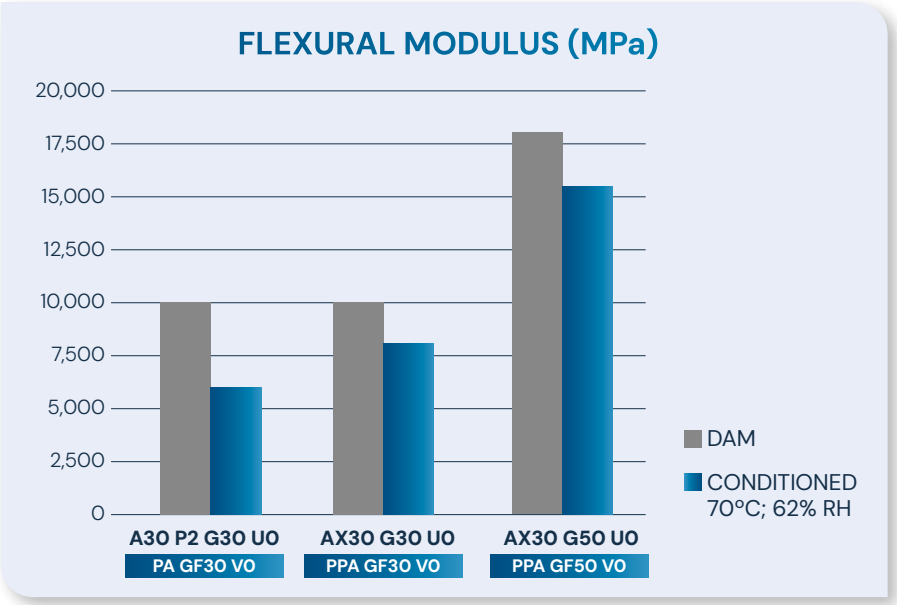




AX & BX FLAME RETARDANT GRADES

Developed for applications requiring **UL94 V0 flame resistance**, these **glass fibre reinforced grades** (up to **50% GF**) combine **excellent mechanical performance** with **halogen** and **red phosphorus-free flame retardancy**. They deliver **outstanding stability** and **reliability** even in **extreme environments**.

	CONDITIONS	TEST METHOD	UNITS	BX300 G50 U0
Density	23 °C	ISO 1183	g/cm³	1.65
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.0
Flammability	1.5 mm thickness	UL 94		V0
		MECHANICAL PROPERTIES		
Tensile modulus	23 °C 1 mm/min	ISO 527-1-2	MPa	17,000 / 15,000
Tensile strength	23 °C 50 mm/min	ISO 527-1-2	MPa	180 /150
Elongation at break	23 °C 50 mm/min	ISO 527-1-2	%	1.5 / 2.5
Flexural modulus	23 °C 2 mm/min	ISO 178	MPa	16,000 / 14,000
Flexural strength	23 °C 2 mm/min	ISO 178	MPa	320 / 260
		THERMAL PROPERTIES		
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	222



PROMYDE® HT Series

HIGH TEMPERATURE PPA

PROMYDE® compounds of **semi-crystalline** and **semi-aromatic** are engineered for **high-performance applications** requiring **strength** and **stiffness** at **elevated temperatures**. They combine thermal stability, **low moisture absorption** and **dimensional consistency** with **excellent electrical and chemical resistance**, offering reliable performance in demanding environments.

KEY FEATURES

- Excellent strength and stiffness at high temperatures.
- Very low moisture absorption, properties remain stable after conditioning.
- HDT >250° C.
- Improved Electrical resistance.
- Recommended for continuous use up to 150° C.
- Dimensional stability.
- Chemical resistance.
- Flame retardancy.

PROCESSING RECOMMENDATIONS

PROCESSING TEMPERATURES	MELTING POINT	
320–340° C	HT1 = 310° C	HT3 = 310° C
	HT2 = 315° C	HT4 = 280°C

ADVANTAGES

- Higher thermal resistance than PA66.
- Competitive alternative to PPS in terms of stiffness and dimensional stability, with improved weld line strength.
- Easier to process than PPS & PEEK.

APPLICATIONS

PROMYDE® PPA compounds bridge the gap between **aliphatic polyamides (PA6, PA66)** and more expensive high-performance polymers such as **PPS and PEEK**. With a high **strength-to-weight ratio** when reinforced with **glass** or **carbon fiber**, they enable **metal replacement** in **demanding environments**. Their **continuous** use **temperatures** of **130–150 °C** make them ideal for **under-the-hood automotive parts**, where they combine chemical resistance with freedom from corrosion by fuels, coolants and salts. In **electronics**, they ensure reliable **connectors** and **sockets** capable of **withstanding soldering** and **high operating temperatures**.

PROMYDE® HT RANGE

HT1 SERIE

BEST MECHANICAL PROPERTIES AND STIFFNESS UP TO 90 °C

A material with high mechanical strength and stiffness in the moderate temperature range.

HT2 SERIE

BEST HIGH-TEMPERATURE CONTINUOUS PERFORMANCE

High HDT. High-performance PPA with elevated Heat Deflection Temperature (HDT), capable of continuous service at high temperatures.

HT3 SERIE

VERY LOW MOISTURE ABSORPTION

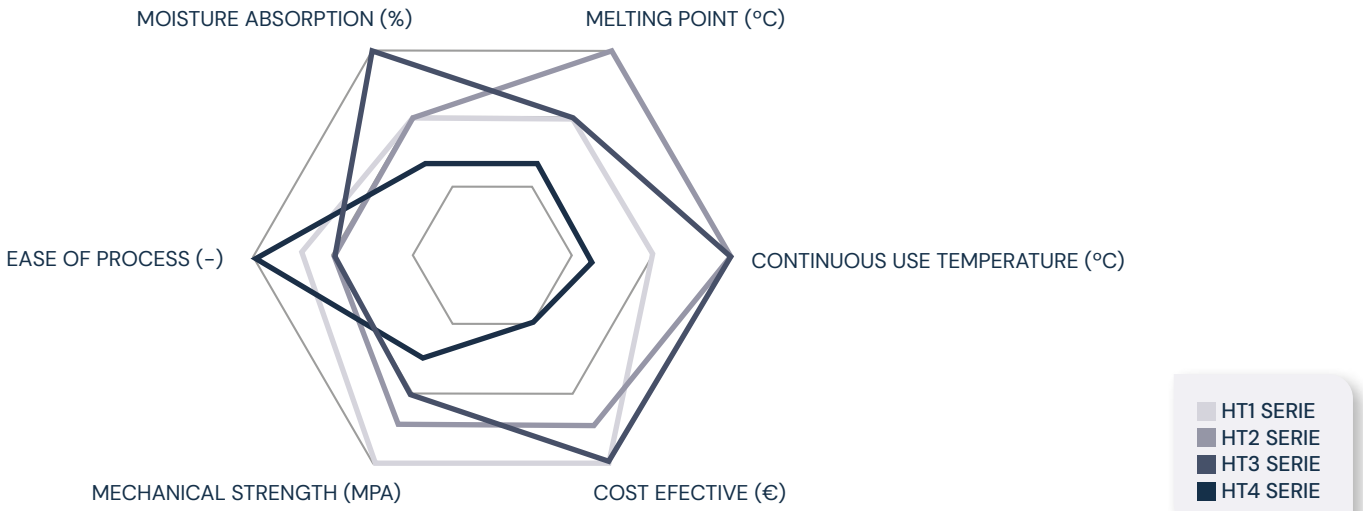
Best dimensional stability. Cost-optimized alternative to PPS & PEEK (especially at temperatures 120–150 °C).

HT4 SERIE

EASY PROCESSING

Best balance between processing and thermal performance HT4 combines easy processing with a balanced trade-off of mechanical and thermal properties.

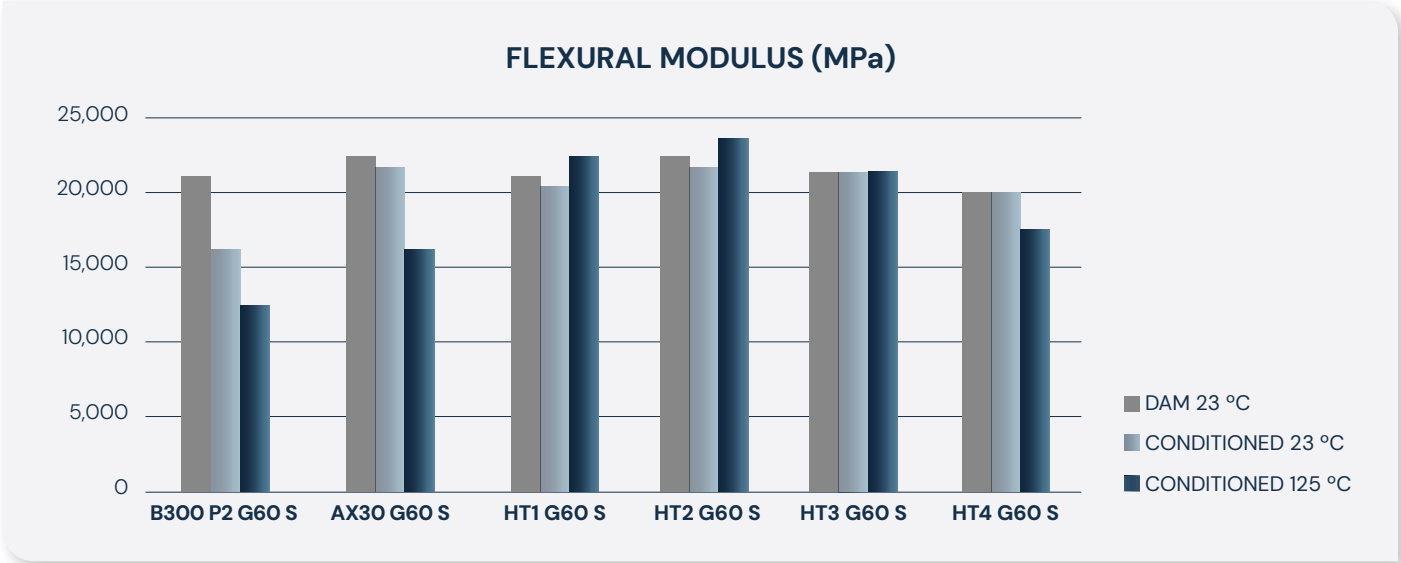
	HT1	HT2	HT3	HT4	PPS	PEEK
Moisture absorption (%)	1.9	1.9	**1.2**	1.9	0	0
Melting Temperature (°C)	310	315	310	**280**	285	340
Glass Transition Temperature (°C)	90	135	130	80	-	-
HDT 1.80 MPa (°C)	285	**285**	280	260	255	330
Continuous Use Temperature (°C)	140	**150**	150	130	210	250



PROMYDE® HT SERIES

HIGH TEMPERATURE PPA

PROMYDE® HT grades offer superior **stiffness** and **strength retention** compared to standard **PROMYDE® B300** and the **PROMYDE® AX series**. Comparative results with **60% glass fibre reinforcement at 23 °C and 125 °C** highlight the advantage of **HT1, HT2, HT3** and **HT4** in **maintaining mechanical** integrity under **thermal** and **humid** conditions.



PROMYDE® HT SERIES

RELIABLE PERFORMANCE WITH EASIER PROCESSING THAN **PPS** AND **PEEK**

PROMYDE® HT grades are engineered to **maintain stiffness and strength** where **standard polyamides** and **semi-aromatic blends** no longer perform.

In comparative testing, the **HT portfolio** demonstrates **high flexural modulus** and **strength** when measured against ultra-high-performance materials such as **PPS and PEEK**.

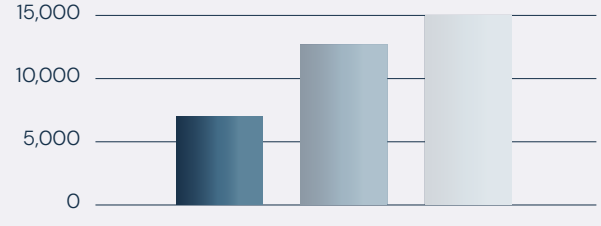
While **PPS and PEEK** provide **superior thermal resistance**, **PROMYDE® HT** grades offer a **more advantageous balance** of **mechanical retention**, **dimensional stability** and **cost efficiency**.

One of the **key benefits** of **PPAs** like **PROMYDE® HT** is their **easier processing**. With **lower melt temperatures** and **shorter cycle times** than **PPS** or **PEEK**, they allow **efficient moulding** of **complex geometries**, **lower energy use** and **increased productivity**.

This makes the **PROMYDE® HT** range an **attractive alternative** in **demanding applications** requiring **durability**, **manufacturing efficiency** and **cost competitiveness**.

KEY FEATURES

- Higher stiffness and strength than PPS and PEEK between 80–150 °C.
- Improved weld line strength, avoiding weak joints in injection moulding.
- Easy injection processing, enabling the production of more complex parts.



PROMYDE® SERIES LC

LONG CHAIN POLYAMIDES

Long-chain polyamides offering **chemical and hydrolysis resistance**, **high flexibility** and **low density**. With reduced **moisture absorption**, they ensure **dimensional stability and durability**. Ideal for **flexible tubing**, **hoses** and **technical profiles**.

KEY FEATURES

- Good mechanical properties.
- Low moisture absorption ensuring an excellent dimensional stability.
- High hydrolysis and chemical resistance.
- Excellent flexibility.
- Low density (~1.01 g/cm³).
- Low fusion temperatures.

AVAILABLE RANGES

Flame retardant, Reinforced and Modified Impact grades.

ADVANTAGES

- Better dimensional stability than PA6 and PA66.
- Higher flexibility vs. short-chain polyamides.
- An alternative to fluoropolymers for tubing and flexible components.

PROCESSING RECOMMENDATIONS

PROCESSING TEMPERATURES	MELTING POINT	
<270° C	LC = 215° C	LC1 = 178° C

APPLICATIONS

Long-Chain Polyamides are **high-performance thermoplastics** widely applied in **engineering** due to its **low moisture absorption**, **dimensional stability**, and excellent **chemical resistance**.

In automotive systems, it is used for **pneumatic tubing**, and **electrical cable sheathing**, where **resistance to hydrocarbons** and **salts** is critical. Industrial uses include **gears**, **bearings**, **seals**, and **powder coatings**, leveraging its **low friction** and **wear resistance**.

Its biocompatibility also supports **medical applications** such as catheters and **sterilizable device housings**.

PROMYDE SERIES TR

CLEAR PERFORMANCE WITH LASTING DURABILITY

PROMYDE® TR is an **amorphous partially aromatic polyamide range**, **transparent** and suitable for **extrusion** and **injection moulding.**

These grades combine **clarity**, **toughness** and **dimensional stability,** with **low moisture absorption** to ensure consistent optical and mechanical performance, even at humid conditions or at **service temperatures of 80–100 °C**.

KEY FEATURES

- High transparency, glass-like appearance.
- Good mechanical properties.
- Low moisture uptake ensures stable optical properties.
- Ensuring stable performance under conditioning and at service temperatures of 80–100°C.

ADVANTAGES

- Great Chemical Resistance.
- Laser Weldable.
- Good optical properties.

PROCESSING RECOMMENDATIONS

PROCESSING TEMPERATURE

210 - 280 °C

APPLICATIONS

Transparent Polyamides are valued for its combination of **optical clarity**, **dimensional stability**, and **chemical resistance**. Its **low moisture absorption** compared to aliphatic polyamides allows **consistent performance** in precision applications.

In automotive systems, it is used for **headlamp covers, interior lighting housings**, and **transparent reservoirs**, where both **strength** and **clarity** are required.

Industrial applications include **sight glasses**, **inspection windows**, and **machine covers** exposed to **chemicals or lubricants**.

In **medical technology**, TR polyamides enable **transparent housings** and **diagnostic components** that must **withstand sterilization**. It is also applied in **consumer optics**, including **lenses**, **visors**, and **transparent electronic casings**.

PROMYDE FLX SERIES

FLEXIBILITY AND TOUGHNESS FOR DYNAMIC APPLICATIONS

The PROMYDE® FLX series are **block copolymers** and compounds that combine **polyamide toughness with polyether elasticity**, resulting in materials with **exceptional flexibility**, **resilience** and **impact resistance**.

These **elastomeric polyamides** maintain **performance** even at low temperatures, while providing **lightweight design and chemical resistance** superior to **conventional elastomers**.

KEY FEATURES

- Exceptional elasticity.
- High impact resistance, even at low temperatures.
- Good chemical resistance vs. conventional elastomers.
- Excellent fatigue resistance.

AVAILABLE RANGES

Portfolio based on Shore Hardness and Flexibility. Range from soft elastomers offering flexibility to harder grades ensuring rigidity and wear resistance.

ADVANTAGES

- Superior flexibility and rebound compared to TPU.
- Keeps toughness at low temperature better than TPE & TPU.

	PEBA	TPU
ELASTICITY	More flexible – Better shape after repeated deformation.	Good flexibility – But can lose shape over time.
LOW-TEMPERATURE PERFORMANCE	Maintains flexibility in very cold conditions (as low as -60 °C).	Becomes stiffer in colder environments.
LIGHTWEIGHT	Lower density (1.01–1.08).	Higher density (1.10–1.25).
ENERGY RETURN	Higher energy return.	Moderate rebound.
FATIGUE RESISTANCE	Superior fatigue and long-term durability under cyclic loads.	Can degrade faster under repeated stress.
MOISTURE RESISTANCE	Less affected by humidity, absorbs less water.	More hygroscopic.
CHEMICAL RESISTANCE	Good resistance to oils, greases, and hydrocarbons.	Depending on the type of TPU.

ENGINEERED TO PERFORM BEYOND STANDARD LIMITS

Promyde®
ADVANCED MATERIALS

PROMYDE® AX & BX SERIES

				BX300 G30 S	BX300 G50 S	BX300 G60 S
PHYSICAL PROPERTIES						
Density	23 °C	ISO 1183	g/cm³	1,36	1,56	1,69
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1,8	1,4	0.9
Water absorption	23 °C saturation in water	ISO 62	%	5,7	4,0	3,0
Flammability	1.5 mm	UL-94		HB	HB	HB
Mould Shrinkage	Parallel	ISO 294-4	%	0.3	0.2	0.2
	Normal			0.4	0.3	0.3
MECHANICAL PROPERTIES (dry/cond.)*						
Tensile modulus	23 °C, 1 mm/min	ISO 527-1-2	MPa	10.000 / 7.900	17.000 / 16.000	21.000 / 20.000
Tensile strength	23 °C, 50 mm/min	ISO 527-1-2	MPa	190 / 140	220 / 200	240 / 220
Elongation at break	23 °C, 50 mm/min	ISO 527-1-2	%	3 / 3	2 / 3	2 / 2.5
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	9.000 / 8.000	16.500 / 15.500	21.000 / 20.000
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	280 / 200	370 / 320	400 / 340
Charpy unnotched impact strength	23 °C	ISO 179/1eU	kJ/m²	90 / 95	100 / 110	100 / 115
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	14 / 20	16 / 18	17 / 19
THERMAL PROPERTIES						
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	222	222	222
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1-2	°C	210	215	220
	0.45 MPa			215	220	220

AX30 G30	AX30 G50	AX30 G60	AX30 CF30	AX30 CF40	AX30 CF50	BX300 G30 UO	BX300 G50 UO	AX30 G30 UO	AX30 G50 UO
1.35	1.56	1.69	1.28	1.38	1.48	1.42	1.65	1.42	1.65
1,5	1.2	0.8	1.5	1.2	1,0	1,5	1,0	1,3	1,0
4,7	3.5	2.9	4.5	4.0	3,5	3,5	3,0	3,2	3,0
HB	HB	HB	HB	HB	HB	V0	V0	V0	V0
0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.4	0.2
0.4	0.3	0.3	0.4	0.3	0.3	0.5	0.3	0.5	0.3
10.000 / 9.700	18.000 / 17.000	23.000 / 22.200	29.000 / 26.000	35.000 / 31.000	41.000 / 37.000	11.000 / 8.500	17.000 / 15.000	11.500 / 9.000	18.000 / 15.000
190 / 170	250 / 230	270 / 255	270 / 240	275 / 245	280 / 250	155 / 120	180 / 150	155 / 125	190 / 160
3 / 5	2.0 / 2.5	2.0 / 2.1	1.5 / 2.0	1.0 / 1.5	1.0 / 1.2	3 / 4	1.5 / 2.5	2.5 / 4.0	1.5 / 2.0
9.500 / 9.300	17.500 / 16.500	22.500 / 21.800	30.000 / 27.000	36.000 / 32.000	42.000 / 38.000	10.000 / 7.500	16.000 / 14.000	11.000 / 8.500	17.000 / 14.000
280 / 235	400 / 370	450 / 400	410 / 360	430 / 390	440 / 400	250 / 190	320 / 260	250 / 200	330 / 270
80 / 90	90 / 95	100 / 110	50 / 60	50 / 60	50 / 60	70 / 80	60 / 70	70 / 80	60 / 70
8 / 15	15 / 16	16 / 18	7 / 11	7 / 11	7 / 11	12 / 15	12 / 14	10 / 12	12 / 14
260	260	260	260	260	260	222	222	260	222
250	250	250	240	240	240	200	210	240	210
250	255	255	255	255	255	215	220	250	220

PROMYDE® HT SERIES

				HT1 G30	HT1 G50	HT1 G60
PHYSICAL PROPERTIES						
Density	23 °C	ISO 1183	g/cm³	1.42	1.62	1.73
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.3	0.9	0.7
Water absorption	23 °C saturation in water	ISO 62	%	3.9	2.8	2.2
Flammability	1.5 mm	UL-94		HB	HB	HB
Mould Shrinkage	Parallel	ISO 294-4	%	0.2	0.1	0.1
	Normal			0.6	0.7	0.7
MECHANICAL PROPERTIES (dry/cond.)*						
Tensile modulus	23 °C, 1 mm/min	ISO 527-1-2	MPa	11,000 / 11,000	17,500 / 17,500	21,000 / 20,500
Tensile strength	23 °C, 50 mm/min	ISO 527-1-2	MPa	180 / 165	255 / 245	285 / 260
Elongation at break	23 °C, 50 mm/min	ISO 527-1-2	%	2.0 / 2.0	2.0 / 2.0	2.0 / 2.0
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	10,000 / 10,000	17,000 / 17,000	20,000 / 20,000
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	270 / 250	390 / 365	450 / 420
Charpy unnotched impact strength	23 °C	ISO 179/1eU	kJ/m²	70 / 80	100 / 105	100 / 105
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	11 / 12	15 / 17	18 / 19
THERMAL PROPERTIES						
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	310	310	310
Glass transition temperature (DSC)	10 °C/min	ISO 3146	°C	90	90	90
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1-2	°C	280	285	285
	0.45 MPa			290	295	295

HT2 G30	HT2 G50	HT2 G60	HT3 G30	HT3 G50	HT3 G60	HT4 G30	HT4 G50	HT4 G60
1.45	1.65	1.78	1.37	1.58	1.69	1.36	1.56	1.67
1.4	1.0	0.8	0.8	0.6	0.5	1.3	0.9	0.8
4.1	2.9	2.3	2.5	1.8	1.4	3.9	2.8	2.3
HB	HB	HB	HB	HB	HB	HB	HB	HB
0.2	0.1	0.1	0.3	0.3	0.3	0.2	0.1	0.1
0.6	0.5	0.4	0.6	0.7	0.7	0.6	0.7	0.7
11,000 / 11,000	18,000 / 18,000	23,000 / 22,600	9,500 / 9,500	16,500 / 16,500	21,000 / 21,000	12,000 / 12,000	16,600 / 16,600	21,000 / 21,000
200 / 180	260 / 255	270 / 250	180 / 170	235 / 225	240 / 235	185 / 165	240 / 220	270 / 250
2.0 / 2.0	2.0 / 2.1	2.0 / 2.1	2.0 / 2.0	2.5 / 2.5	2.0 / 2.0	2.3 / 2.5	2.0 / 2.1	2.0 / 2.1
10,000 / 10,000	17,500 / 17,500	22,000 / 21,500	9,000 / 9,000	16,300 / 16,300	21,000 / 21,000	10,000 / 10,000	16,000 / 16,000	20,000 / 20,000
280 / 260	400 / 380	430 / 400	260 / 250	335 / 325	380 / 370	275 / 255	360 / 340	410 / 390
95 / 100	100 / 110	100 / 105	80 / 85	90 / 95	95 / 100	80 / 90	100 / 105	100 / 105
13 / 14	18 / 19	18 / 19	10 / 11	14 / 15	15 / 16	11 / 13	16 / 17	17 / 18
315	315	315	310	310	310	275	275	275
135	135	135	130	130	130	80	80	80
280	285	285	280	280	280	260	260	260
290	295	295	290	290	290	240	240	240

PROMYDE® TR, LC & FLX SERIES

				TR80 P	TR130 P
PHYSICAL PROPERTIES					
Density	23 °C	ISO 1183	g/cm3	1,18	1,18
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	2,1	2,000
Water absorption	"23 °C saturation in water"	ISO 62	%	6,5	6,0
Flammability	1,5 mm	UL-94		V2	V2
Mould Shrinkage	Parallel	ISO 294-4	%	-	-
	Normal			-	-
Shore D Hardness	23°C ; DAM	ISO 868	-	-	-
Shore A Hardness	23°C ; DAM	ISO 868	-	-	-
Melting Range		ISO 3146	°C	-	-
MECHANICAL PROPERTIES (dry/cond.)*					
Tensile modulus	23 °C, 1 mm/min	ISO 527-1-2	MPa	2.800	3.000
Tensile strength	23 °C, 50 mm/min	ISO 527-1-2	MPa	35	65
Elongation at yield	23 °C, 50 mm/min	ISO 527-1-2	%	-	-
Elongation at break	23 °C, 50 mm/min	ISO 527-1-2	%	2,0	2,5
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	3.000	3.100
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	130	150
Charpy unnotched impact strength	23°C	ISO 179/1eU	kJ/m2	NB	NB
Charpy notched impact strength	23°C	ISO 179/1eA	kJ/m2	4	4
Charpy Impact Strength 1)	23°C	ISO 179/1eU	kJ/m2	-	-
	-30°C			-	-
THERMAL PROPERTIES					
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	80	128
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1-2	°C	65	105
	0.45 MPa			75	115

LC30 P	LC140 P	LC140 FLX	FLX40 D43	FLX40 D65
1,07	1,01	1,02	1,02	1,04
1,3	0,8	0,7	0.5	0.7
3,0	1,6	1,4	_	_
_	_	_	_	_
1,0	0,7	0,9	_	_
1,0	1,2	1,3	_	_
-	-	-	43	65
-	-	-	92	-
-	-	-	140-150	185-195
2.200 / 1.400	1500 / -	400 / -	100	300
60 / 55	40 / -	25 / -	25	42
5 / 25	4 / -	20 / -	-	-
> 30 / 40	> 50 / -	> 150 / -	> 500	> 200
2.200 / 1.400	1200 / -	360 / -	90	320
60 / 55	45 / -	15 / -	5	18
NB / NB	NB / -	NB / -	-	-
5 / 6	30 / -	NB / -	-	-
-	-	-	NB	NB
-	-	-	NB	NB
215	178	174	-	-
60	50	40	-	-
180	110	95	-	

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