

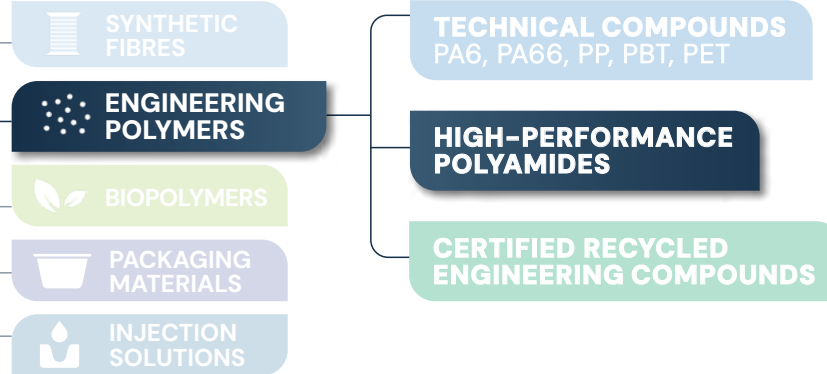


**HIGH-PERFORMANCE
POLYAMIDES**

**PRODUCT
PORTFOLIO**



50 YEARS OF EXPERTISE IN ADVANCED MATERIALS



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

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

The new PROMYDE® High-Performance Polyamides portfolio extends 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 CENTRE FOR NEW ADVANCED MATERIALS

At NUREL, we operate a **state-of-the-art Innovation Centre** 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 POLYMERISATION PLANT

2 PILOT SCALE COMPOUNDING EXTRUDERS

2 INJECTION MOULDING LINES

CAST & THERMOFORMING PILOT LINE

7-LAYER BLOWN COEXTRUSION LINE



MATERIAL CHARACTERISATION

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 AGEING

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 **minimising 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 **16,560 MWh** annually and **prevents the emission of 11,000 tonnes of CO₂** 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 centre comes from renewable sources**, avoiding the **emission of 11,000 tonnes of CO₂** 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 CO₂ saved



**ON-SITE
GENERATION**
30% of electricity
generated on site



HIGH-PERFORMANCE POLYAMIDES

With over **50 years of experience** in polymer science and engineering, NUREL combines **in-house polymerisation** 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® AX & BX SERIES

SEMI-AROMATIC PPA:

Excellent mechanical properties even under **high-humidity conditions**, **enhanced dimensional stability**, **reduced warpage** and **improved surface finish**.

PROMYDE® HT SERIES

HIGH-TEMPERATURE SEMI-AROMATIC PPA:

Excellent mechanical and thermal stability, **low moisture absorption**. Suitable for use at **high continuous temperatures** (up to 150 °C).

PROMYDE® LC SERIES

LONG-CHAIN POLYAMIDES:

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

PROMYDE® TR

AMORPHOUS TRANSPARENT POLYAMIDES:

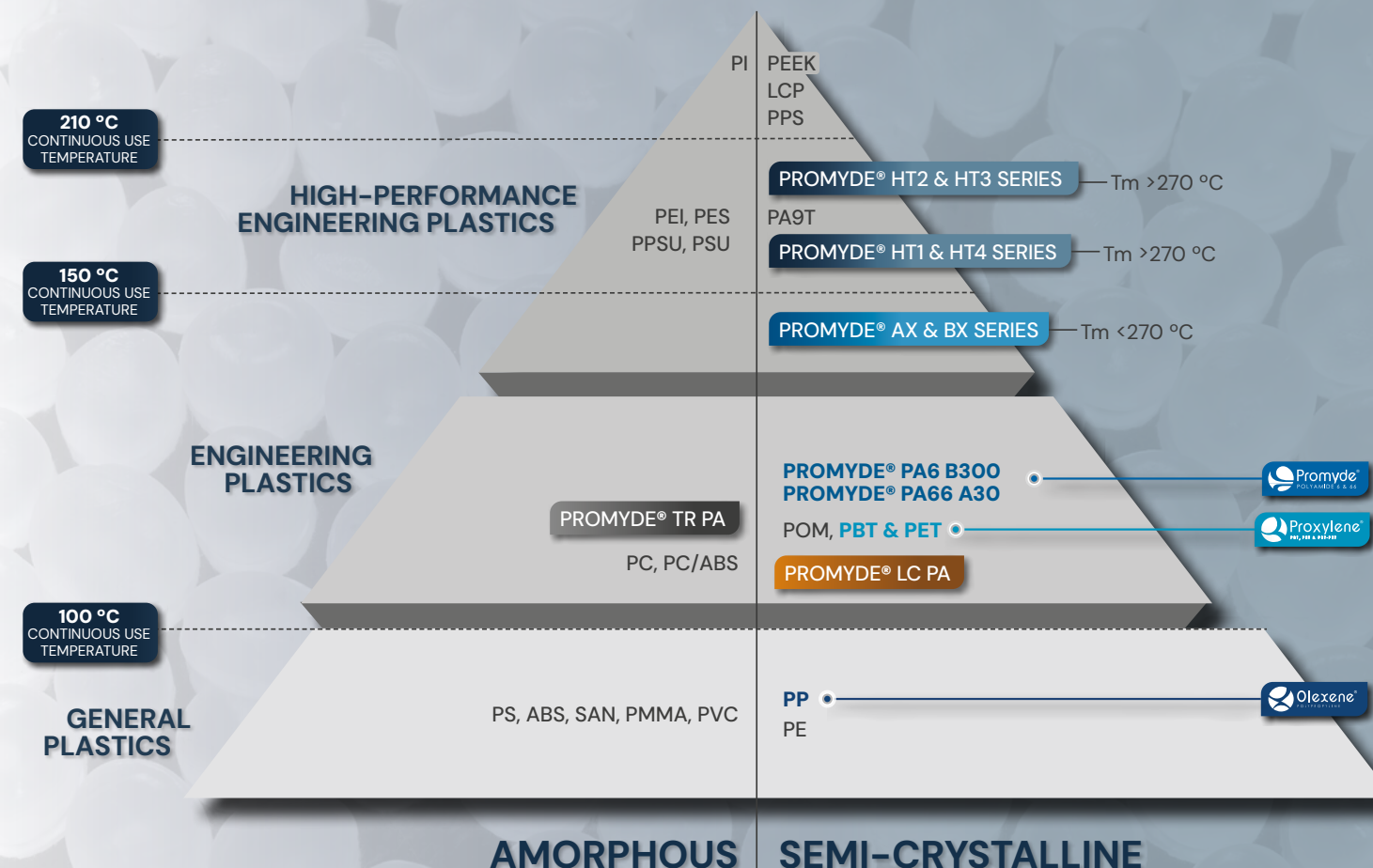
Glass-like clarity with reliable toughness and thermal resistance.

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 **reduced warpage**, **better surface finish** and more **reliable performance** under demanding conditions.

KEY FEATURES

- High modulus and tensile strength, even in the conditioned state.
- Excellent dimensional stability, reduced warpage.
- Superior surface finish compared to PA6/PA66.
- Heat deflection temperature (HDT): 200–250 °C
- Processing temperatures and conditions similar to those of 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.
- High retention of mechanical properties after conditioning.
- Positioned below high-aromatic PPA (HT series) but more cost-effective.

PROCESSING RECOMMENDATIONS

MELTING POINT

AX ≈ 260 °C
BX ≈ 225 °C

PROCESSING TEMPERATURES

<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.

PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNITS	B300 P2 G60 BLO2	BX300 G60 BLO2	AX30 G60 BLO2
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.2	0.9	0.8
Water absorption	23 °C / saturation	ISO 62	%	4.5	3.0	2.90
MECHANICAL PROPERTIES (dry/cond.)*						
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 11357-3	°C	222	222	260

* dry = dry as moulded / cond. = conditioned according to ISO 1110

AX CARBON-FIBRE-REINFORCED GRADES

PROMYDE® AX 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.

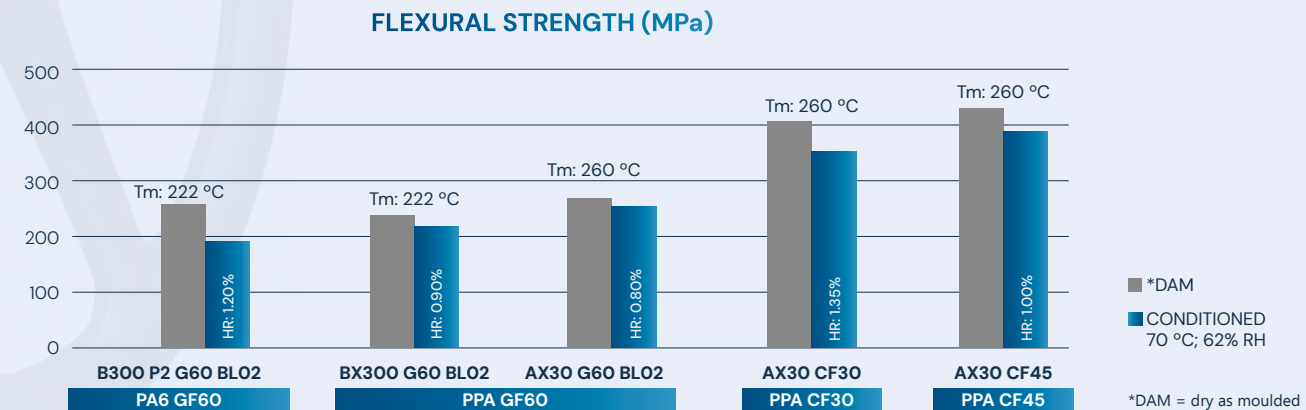
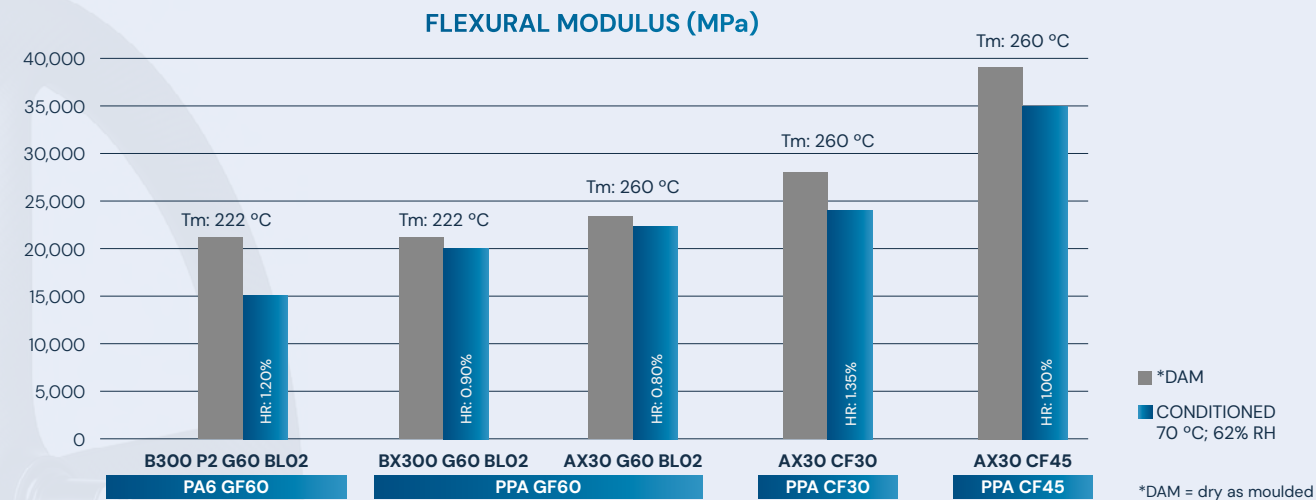
PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNITS	AX30 CF30	AX30 CF40	AX30 CF50
Density	23 °C	ISO 1183	g/cm³	1.28	1.38	1.48
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.5	1.2	1.0
MECHANICAL PROPERTIES (dry/cond.)*						
Tensile modulus	23 °C 1 mm/min	ISO 527-1/-2	MPa	29,000 / 26,000	35,000 / 31,000	41,000 / 37,000
Tensile strength	23 °C 50 mm/min	ISO 527-1/-2	MPa	270 / 240	275 / 245	280 / 250
Elongation at break	23 °C 50 mm/min	ISO 527-1/-2	%	1.5 / 2.0	1.0 / 1.5	1.0 / 1.2
Flexural modulus	23 °C 2 mm/min	ISO 178	MPa	30,000 / 27,000	36,000 / 32,000	42,000 / 38,000
Flexural strength	23 °C 2 mm/min	ISO 178	MPa	410 / 360	430 / 390	440 / 400
THERMAL PROPERTIES						
Melting temperature (DSC)	10 °C/min	ISO 11357-3	°C	260	260	260

* dry = dry as moulded / cond. = conditioned according to ISO 1110

AX CARBON-FIBRE-REINFORCED GRADES

MECHANICAL PROPERTIES VS WATER UPTAKE

PROMYDE® AX 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 **UL 94 V-0 flame-retardant performance**, these **glass-fibre-reinforced grades** (up to **50% GF**) combine **excellent mechanical performance** with **halogen-free** and **red-phosphorus-free flame retardancy**. They deliver **outstanding stability** and **reliability** even in **extreme environments**.

PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNITS	BX300 G30 UO	BX300 G50 UO	AX30 G30 UO	AX30 G50 UO
Density	23 °C	ISO 1183	g/cm³	1.42	1.65	1.42	1.65
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.5	1.0	1.3	1.0
Flammability	1.5 mm thickness	UL 94	–	V-0	V-0	V-0	V-0

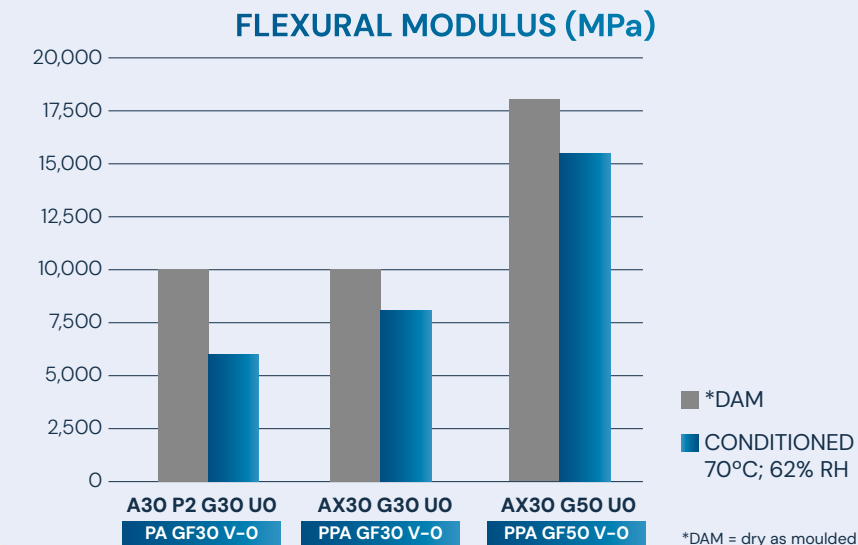
MECHANICAL PROPERTIES (dry/cond.)*

Tensile modulus	23 °C 1 mm/min	ISO 527-1/-2	MPa	11,000 / 8,500	17,000 / 15,000	11,500 / 9,000	18,000 / 15,000
Tensile strength	23 °C 50 mm/min	ISO 527-1/-2	MPa	155 / 120	180 / 150	155 / 125	190 / 160
Elongation at break	23 °C 50 mm/min	ISO 527-1/-2	%	3.0 / 4.0	1.5 / 2.5	2.5 / 4.0	1.5 / 2.0
Flexural modulus	23 °C 2 mm/min	ISO 178	MPa	10,000 / 7,500	16,000 / 14,000	11,000 / 8,500	17,000 / 14,000
Flexural strength	23 °C 2 mm/min	ISO 178	MPa	250 / 190	320 / 260	250 / 200	330 / 270

THERMAL PROPERTIES

Melting temperature (DSC)	10 °C/min	ISO 11357-3	°C	222	222	260	260
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* dry = dry as moulded / cond. = conditioned according to ISO 1110



DISCOVER AX & BX FOR EV BATTERY APPLICATIONS



PROMYDE® HT SERIES

HIGH-TEMPERATURE PPA

PROMYDE® semi-crystalline, semi-aromatic compounds 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, helping maintain stable properties 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 HT2 = 315 °C
	HT3 = 310 °C HT4 = 275 °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 and 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 fibre**, 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 SERIES

BEST MECHANICAL PROPERTIES AND STIFFNESS UP TO 90 °C

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

HT2 SERIES

BEST HIGH-TEMPERATURE CONTINUOUS PERFORMANCE

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

HT3 SERIES

VERY LOW MOISTURE ABSORPTION

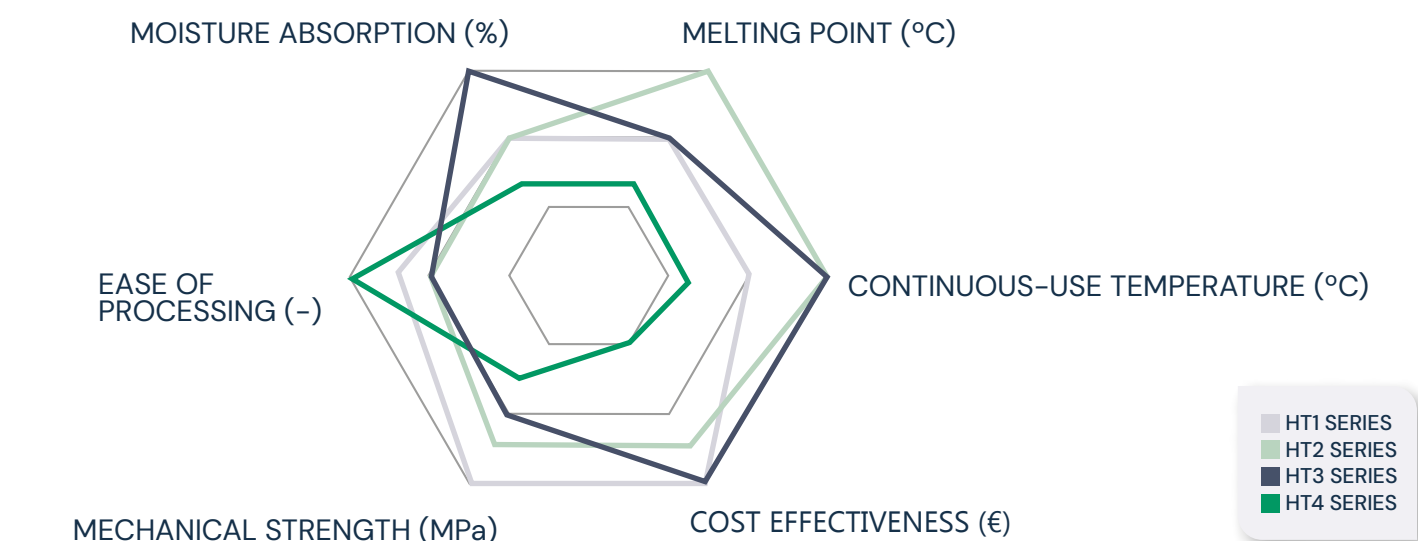
Best dimensional stability. Cost-optimised alternative to PPS & PEEK (especially at temperatures 120–150 °C).

HT4 SERIES

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	275	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



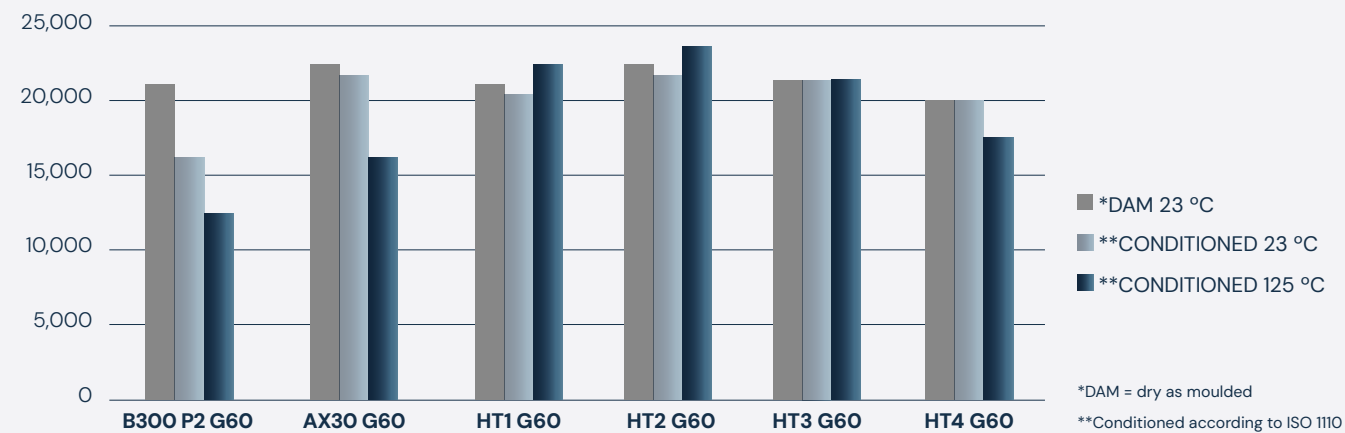


PROMYDE® HT SERIES

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.

FLEXURAL MODULUS (MPa)



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**.

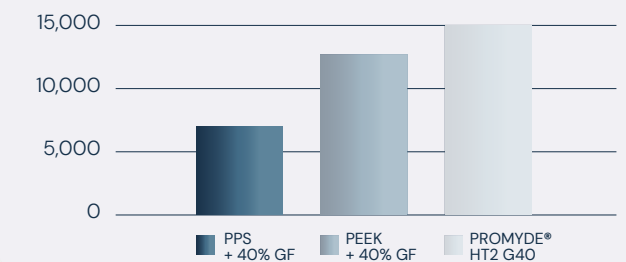
One of the **key benefits** of PPAs like **PROMYDE® HT** is their **improved processability**. With **lower melt temperatures** and **shorter cycle times** than **PPS** or **PEEK**, they allow **efficient moulding** of **complex geometries**, **lower energy use** and **increased productivity**.

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.

FLEXURAL MODULUS at 120 °C (MPa)





PROMYDE® LC SERIES

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 excellent dimensional stability.
- High hydrolysis and chemical resistance.
- Excellent flexibility.
- Low density (~1.01 g/cm³).
- Low melting temperatures.

AVAILABLE RANGES

Flame-retardant, reinforced and impact-modified grades.

APPLICATIONS

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

In automotive systems, they are 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 their **low friction** and **wear resistance**.

Their biocompatibility also supports **medical applications** such as catheters and **sterilisable device housings**.



ADVANTAGES

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

PROCESSING RECOMMENDATIONS

PROCESSING TEMPERATURES

<270 °C

MELTING POINT

LC = 215 °C LC1 = 178 °C

PROMYDE® TR SERIES

TRANSPARENT PA 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 under humid conditions or at **service temperatures of 80–120 °C**.

ADVANTAGES

- Excellent chemical resistance.
- Laser-weldable.
- Good optical properties.

APPLICATIONS

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

In automotive systems, they are 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 sterilisation**. They are also used in **consumer optics**, including **lenses, visors**, and **transparent electronic casings**.

KEY FEATURES

- High transparency, glass-like appearance.
- Good mechanical properties.
- Low moisture uptake ensures stable optical properties.
- Stable performance after conditioning and at service temperatures of 80–120 °C.

PROCESSING RECOMMENDATIONS

PROCESSING TEMPERATURE

210 – 280 °C





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 compared to conventional elastomers.
- Excellent fatigue resistance.

AVAILABLE RANGES

The PROMYDE® FLX range includes products with low moisture absorption as well as hydrophilic products with high water vapour permeability.

ADVANTAGES

- Superior flexibility and rebound compared to TPU.
- Better toughness retention at low temperatures than conventional TPEs and TPUs.



	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.
CHEMICAL RESISTANCE	Good resistance to oils, greases, and hydrocarbons.	Varies depending on TPU chemistry.

ENGINEERED TO PERFORM BEYOND STANDARD LIMITS



PROMYDE® AX & BX SERIES

BX SERIES				
			FLAME RETARDANT	
BX300 G30	BX300 G50	BX300 G60	BX300 G30 UO	BX300 G50 UO

PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT					
Density	23 °C	ISO 1183	g/cm³	1.36	1.56	1.69	1.42	1.65
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.8	1.4	0.9	1.5	1.0
Water absorption	23 °C / saturation	ISO 62	%	5.7	4.0	3.0	3.5	3.0
Flammability	1.5 mm	UL 94		HB	HB	HB	V-O	V-O
Mould Shrinkage	Parallel	ISO 294-4	%	0.3	0.2	0.2	0.4	0.2
	Normal			0.4	0.3	0.3	0.5	0.3

MECHANICAL PROPERTIES (dry/cond.)*	CONDITIONS	TEST METHOD	UNIT					
Tensile modulus	23 °C, 1 mm/min	ISO 527-1/-2	MPa	10,000 / 7,900	17,000 / 16,000	21,000 / 20,000	11,000 / 8,500	17,000 / 15,000
Tensile strength	23 °C, 50 mm/min	ISO 527-1/-2	MPa	190 / 140	220 / 200	240 / 220	155 / 120	180 / 150
Elongation at break	23 °C, 50 mm/min	ISO 527-1/-2	%	3.0 / 3.0	2.0 / 3.0	2.0 / 2.5	3.0 / 4.0	1.5 / 2.5
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	9,000 / 8,000	16,500 / 15,500	21,000 / 20,000	10,000 / 7,500	16,000 / 14,000
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	280 / 200	370 / 320	400 / 340	250 / 190	320 / 260
Charpy unnotched impact strength	23 °C	ISO 179/1eU	kJ/m²	90 / 95	100 / 110	100 / 115	70 / 80	60 / 70
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	14 / 20	16 / 18	17 / 19	12 / 15	12 / 14

THERMAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT					
Melting temperature (DSC)	10 °C/min	ISO 11357-3	°C	222	222	222	222	222
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1/-2	°C	210	215	220	200	210
	0.45 MPa			215	220	220	215	220

* dry = dry as moulded / cond. = conditioned according to ISO 1110
NB = No break ; DAM = dry as moulded

AX SERIES								
						FLAME RETARDANT		
AX30 G30	AX30 G50	AX30 G60	AX30 CF30	AX30 CF40	AX30 CF50	AX30 G30 UO	AX30 G50 UO	AX30 CF40 UO

1.35	1.56	1.69	1.28	1.38	1.48	1.42	1.65	1.43
1.5	1.2	0.8	1.5	1.2	1.0	1.3	1.0	1.0
4.7	3.5	2.9	4.5	4.0	3.5	3.2	3.0	4.0
HB	HB	HB	HB	HB	HB	V-O	V-O	V-O
0.3	0.2	0.2	0.3	0.2	0.2	0.4	0.2	0.1
0.4	0.3	0.3	0.4	0.3	0.3	0.5	0.3	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	11,500 / 9,000	18,000 / 15,000	26,000 / 24,000
190 / 170	250 / 230	270 / 255	270 / 240	275 / 245	280 / 250	155 / 125	190 / 160	170 / 150
3.0 / 5	2.0 / 2.5	2.0 / 2.1	1.5 / 2.0	1.0 / 1.5	1.0 / 1.2	2.5 / 4.0	1.5 / 2.0	1.0 / 1.5
9,500 / 9,300	17,500 / 16,500	22,500 / 21,800	30,000 / 27,000	36,000 / 32,000	42,000 / 38,000	11,000 / 8,500	17,000 / 14,000	25,500 / 23,500
280 / 235	400 / 370	450 / 400	410 / 360	430 / 390	440 / 400	250 / 200	330 / 270	265 / 235
80 / 90	90 / 95	100 / 110	50 / 60	50 / 60	50 / 60	70 / 80	60 / 70	30 / 35
8 / 15	15 / 16	16 / 18	7 / 11	7 / 11	7 / 11	10 / 12	12 / 14	4 / 6

260	260	260	260	260	260	260	260	260
250	250	250	240	240	240	240	245	245
250	255	255	255	255	255	250	255	255

Values have been established by standard tests. The data should be considered as a guide and not as binding minimum values.
As processing and application conditions may vary, individual testing is recommended to determine the suitability of the product for the intended use.

HT1 SERIES			
	FLAME RETARDANT		
HT1 G30	HT1 G30 UO	HT1 G50	HT1 G60

PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT				
Density	23 °C	ISO 1183	g/cm³	1.42	1.44	1.62	1.73
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	1.3	1.3	0.9	0.7
Water absorption	23 °C / saturation	ISO 62	%	3.9	3.7	2.8	2.2
Flammability	1.5 mm	UL 94		HB	V-O	HB	HB
Mould Shrinkage	Parallel	ISO 294-4	%	0.2	0.2	0.1	0.1
	Normal			0.6	0.6	0.7	0.7

MECHANICAL PROPERTIES (dry/cond.)*	CONDITIONS	TEST METHOD	UNIT				
Tensile modulus	23 °C, 1 mm/min	ISO 527-1/-2	MPa	11,000 / 11,000	11,500 / 10,500	17,500 / 17,500	21,000 / 20,500
Tensile strength	23 °C, 50 mm/min	ISO 527-1/-2	MPa	180 / 165	170 / 160	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	2.0 / 2.0
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	10,000 / 10,000	10,500 / 9,500	17,000 / 17,000	20,000 / 20,000
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	270 / 250	260 / 240	390 / 365	450 / 420
Charpy unnotched impact strength	23 °C	ISO 179/1eU	kJ/m²	70 / 80	65 / 70	100 / 105	100 / 105
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	11 / 12	10 / 11	15 / 17	18 / 19

THERMAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT				
Melting temperature (DSC)	10 °C/min	ISO 11357-3	°C	310	310	310	310
Glass transition temperature (DSC)	10 °C/min	ISO 11357-2	°C	90	90	90	90
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1/-2	°C	280	280	285	285
	0.45 MPa			290	290	295	295

* dry = dry as moulded / cond. = conditioned according to ISO 1110
NB = No break ; DAM = dry as moulded

HT2 SERIES			HT3 SERIES			HT4 SERIES		
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

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PROMYDE® TR, LC & FLX SERIES

				TR80 P	TR131 P	TR135 P	TR155 P	TR160 P
PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT					
Density	23 °C	ISO 1183	g/cm³	1.18	1.18	1.03	1.18	1.18
Moisture absorption	23 °C / 50% r.h.	ISO 62	%	2.1	2.0	1.5	1.5	1.5
Water absorption	23 °C / saturation	ISO 62	%	6.5	6.0	3.5	3.0	3.5
Flammability	1,5 mm	UL 94		V-2	V-2	HB	HB	HB
Mould Shrinkage	Parallel	ISO 294-4	%	-	0.37	0.65	0.65	0.60
	Normal			-	0.50	0.75	0.75	0.70
Shore D Hardness	23 °C ; DAM	ISO 868	-	-	-	-	-	-
Shore A Hardness	23 °C ; DAM	ISO 868	-	-	-	-	-	-
Water vapour transmission rate, 50 µ film	85% RH, 23 °C	ISO 15106-1	g/m²·day	-	-	-	-	-
MECHANICAL PROPERTIES (dry/cond.)*	CONDITIONS	TEST METHOD	UNIT					
Tensile modulus	23 °C, 1 mm/min	ISO 527-1/-2	MPa	2,800	2,900	1,600	1,700	2,000
Tensile strength	23 °C, 50 mm/min	ISO 527-1/-2	MPa	35	95	60	63	75
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	> 50	> 50	> 50	> 50
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	3,000	2,900	1,500	1,600	1,900
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	130	137	55	60	85
Charpy unnotched impact strength	23 °C	ISO 179/1eU	kJ/m²	NB	NB	NB	NB	NB
	-30 °C	ISO 179/1eU	kJ/m²	-	NB	NB	NB	NB
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	4.0	8.5	12	10	7
	-30 °C	ISO 179/1eA	kJ/m²	-	7	10	9	6
THERMAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT					
Melting temperature (DSC)	10 °C/min	ISO 11357-3	°C	170	-	-	-	-
Glass transition temperature (DSC)	10 °C/min	ISO 11357-2	°C	80	131	135	155	160
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1/-2	°C	65	105	105	115	120
	0.45 MPa			75	120	120	135	140

* dry = dry as moulded / cond. = conditioned according to ISO 1110
NB = No break ; DAM = dry as moulded

LC30 P	LC130 P	LC130 G20 MI	LC130 G30 HS	LC140 P	LC140 FLX	FLX40 D43	FLX40 D43 HT	FLX30 TW D43	FLX40 D65
1.07	1.01	1.12	1.22	1.01	1.02	1.02	1.04	1.02	1.04
1.3	0.7	0.5	0.5	0.8	0.7	0.9	1.3	0.5	0.7
3.0	1.5	1.1	1.1	1.6	1.4	4.0	5.0	80	-
-	-	HB	HB	-	-	-	-	-	-
1.0	1.2	0.3	0.1	0.7	0.9	-	-	-	-
1.0	1.3	1.0	0.8	1.2	1.3	-	-	-	-
-	-	70	70	-	-	43	43	43	65
-	-	-	-	-	-	92	92	92	-
-	-	-	-	-	-	-	-	2,000	-
2,200 / 1,400	1,500 / -	4,500 / 3,500	7,000 / 6,000	1,500 / -	400 / -	100	100	150	300
60 / 55	40 / -	95 / 80	122 / 110	40 / -	25 / -	25	21	21	42
5 / 25	7 / -	-	-	4 / -	20 / -	-	-	-	-
> 30 / 40	> 50 / -	10 / 15	4.5 / 7.0	> 50 / -	> 150 / -	> 500	> 500	> 500	> 200
2,200 / 1,400	1,200 / -	-	-	1,200 / -	360 / -	90	128	128	320
60 / 55	45 / -	-	-	45 / -	15 / -	5.0	7.0	7.0	18
NB / NB	NB / -	70 / 80	70 / 80	NB / -	NB / -	-	-	-	-
5.0 / 6.0	6.0 / 6.0	-	-	30 / -	NB / -	-	-	-	-
-	-	20 / 25	20 / 22	-	-	NB	NB	NB	NB
-	-	18 / 20	15.5 / 18	-	-	NB	NB	NB	NB
215	178	178	178	178	174	150	215	210	190
-	-	-	-	-	-	-60	-60	-60	-60
60	50	75	90	50	40	-	-	-	-
180	100	130	160	110	95	-	-	-	-

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