Promyde®
POLYAMIDE 6 & 66

POLYAMIDE 6
FOR EXTRUSION

NUREL
ENGINEERING POLYMERS

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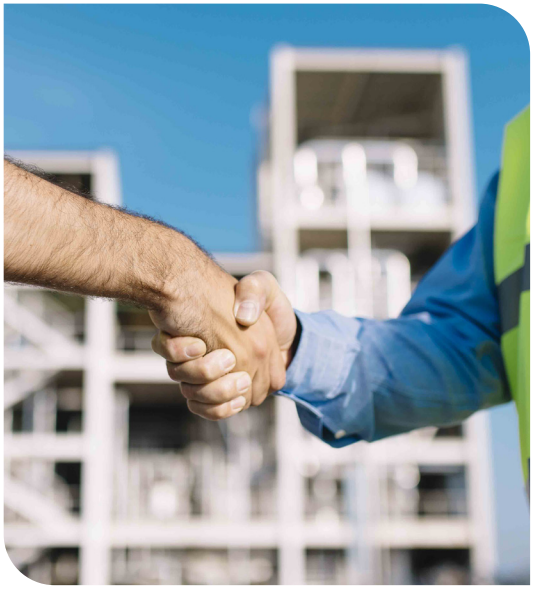
INTRODUCING PROMYDE®



PROMYDE® POLYAMIDE 6 FOR EXTRUSION

As part of **SAMCA**, a solid industrial group, NUREL has **50 years of experience in polymerization**. NUREL has acquired extensive expertise in polymer chemistry and filament spinning, and has harnessed this knowledge to serve our customers by developing **specific polymers for various extrusion applications**. Our expertise positions NUREL as a reliable supplier in the **polyamide 6** market, with a global presence in numerous extrusion market segments, ranging from **high tenacity yarns to profiles and pipes**, and from **extrusion blow molding for containers to cable jacketing**.

The **modification of polymer chains** during polymerization, coupled with the **unique additive packages** we offer, constitutes the cornerstone of our broad **Promyde** extrusion portfolio. With **state-of-the-art laboratories** for analyzing both chemical and mechanical properties, and synergies with other polymerization companies within the SAMCA Group, NUREL can swiftly translate customer requests for **new developments from laboratory stages to full-scale industrial production** within months.

ADDITIVE PACKAGES

Our extensive product range offers various solutions for each application, ranging from a **relative viscosity of 3.0 to 5.0**, along with a broad selection of additives:

- **UV protection and heat stabilizers** to extend the lifespan of outdoor applications like electrical conduits.
- **Impact-modifiers** to enhance toughness in tubes and cables.
- **Glass fiber-reinforcements** to increase stiffness in profiles and bars.
- **Flame retardancy agents** for electrical applications.
- **High-flexibility** modifiers for flexible piping options.
- **Coloring** in RAL color cards and custom color matching.
- Additional additives, to **reduce friction coefficients** and **conductive agents**, are available upon request.

PA6 FOR CABLES AND FLEXIBLE TUBES EXTRUSION

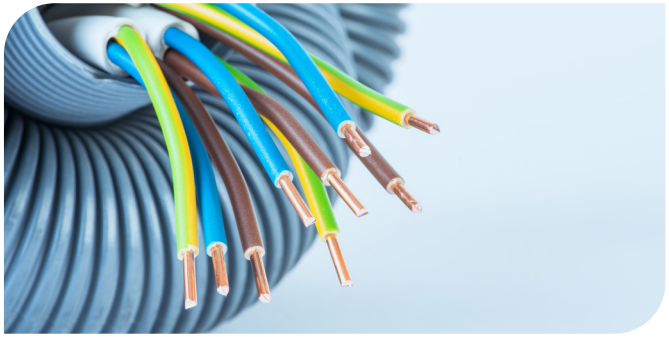
CABLE JACKETING

EXTREME CONDITION RESISTANCE: UL 83 CERTIFIED

Promyde protects THHN & THWN cable from abrasions and stress cracking. It is oil resistant, certified Oil II, resistant to 720h of UV light. Certified Sun Resistant.

- → Promyde B33 L UV HS complies with America's highest demands.
- → Certified UL 83 VW-1 and Cable Tray (C.T. Rated) for > 14AWG.
- → B33 L UV HS permits a high speed production – metres / minute. Provides a smooth, fine coat with a homogeneous thin thickness.

Grade Designation	Oil Resitance Rating	Gasoline Resistant	Sunlight Resistant
B33 L UV HS	I, II	yes	All colors



FLEXIBLE TUBES

ELECTRIC CONDUITS FOR RAILWAYS, UL94, UL1660 AND HL3 UNE 45545

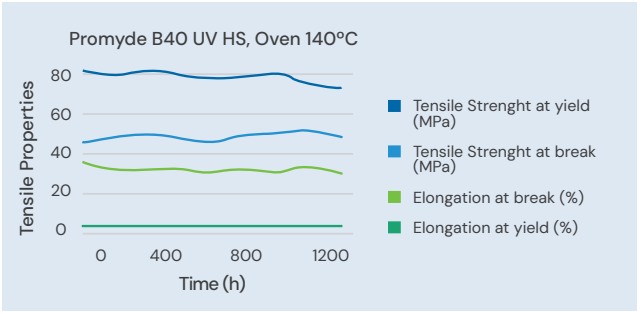
An important application of **Promyde**® is in **flexible tubes** and **corrugated pipes** for electrical conduits, ensuring cable protection.

• **Long-term heat and hot oil resistance, Promyde B40 L UV HS, HS2, and HS3** are compliant with **UL1660** standards.

• **V0 types for conduits**. **Promyde B40 P2 U0/B40 P2 U0 UV HS** is **UL94** Certified and **HL3** compliant according to **UNE 45545 for trains**, railways, underground, and metro systems.

• **For flexible piping needs** with a **low modulus of 500 MPa, Promyde B40 P2 FLX FC** is recommended. It complies with **food contact** regulations and it is ideal for metal pipe coating in food and beverage production.

• Our **B50 grade** is suitable for **compressed air pipes thanks to its superior resistance**.



PA6 FOR SEMIFINISHED PRODUCTS EXTRUSION

SHEETS, PROFILES & TUBES

MECHANICAL PERFORMANCE & ISOLATION

The construction sector employs **Promyde® PA6** grades primarily **in sheet** form for embellishing the exterior panels of buildings. Additionally, polyamide profiles are used as **insulation within aluminum window frames**, effectively breaking thermal bridges and enhancing building insulation.

Promyde PA6 stands out due to its remarkable **impact resistance, strength, high tenacity** even in extreme temperatures, **low abrasion**, **excellent processing** capabilities, and **chemical resistance.**

These attributes make **Promyde PA6** a top choice for designing components intended for demanding conditions.

Promyde offers a wide range of **high-viscosity** products, with high melt-strength variants, impact-modified grades, and extremely stiff materials. Thanks to our recent investment in compounding, NUREL can tailor solutions to specific requirements, including color preferences.

Promyde offers a wide range of high-viscosity products **up to RV 5.0**, with **high melt-strength variants, impact-modified grades**, and **extremely stiff materials**."

RODS & STOCK SHAPES

FROM 3.3 TO 5.0 VISCOSITY RANGE

Our **Promyde® PA6 high tenacity grades** can be tailored for the extrusion of **solid bar and rod** , ensuring an efficient hardware use. **Promyde**'s consistent performance for narrow extrusion processing parameters, guaranteeing optimization and efficiency in production.

Promyde PA6 is the preferred material for engineering plastic parts due to its exceptional properties, which include remarkable **stiffness, strength, hardness, wear resistance, sliding characteristics, chemical resistance, and thermal stability**. **Promyde** grades, with viscosities ranging from **3.3 to 5.0**, are the ideal choice for manufacturing machined engineering parts using semi-finished bars.

Promyde, available in both **reinforced and unreinforced PA6**, can be utilized in the production of rings for static applications, support, separation, or as thermal and chemical barriers. Bushings and guiding parts made from **Promyde** will enhance their sliding capabilities, wear resistance, and stiffness properties.

EXTRUSION BLOW MOULDING

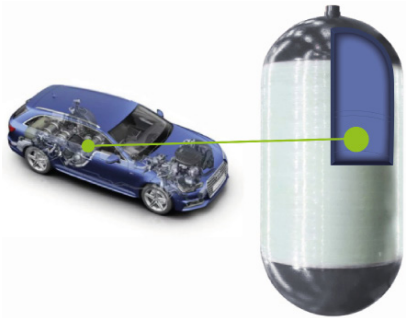
UP TO A VISCOSITY OF 5.0 FOR HIGH-PRESSURE CONDITIONS

The demanding conditions of heat aging required for **automotive parts** and components have driven the increased utilization of PA (Polyamide) in blow molding applications within the car industry. This expansion encompasses a range of components, including air intake manifolds, exhaust intercoolers, turbochargers, compressed air tanks, and even high-pressure hydrogen containers.

Polyamide 6 offers **high chemical resistance**, making tanks and containers manufactured with **Promyde PA6** excellent **for storing and transporting corrosive or aggressive liquids and gases**, such as thermal coolants, hydrocarbons, mineral oils, and even gases such as hydrogen.

Promyde also boasts an impressive **oxygen barrier** property in addition to excellent blow molding characteristics, making it a suitable choice for applications in **chemical and agrochemical containers**.

Our standard blow molding types are **Promyde B40L and Promyde B50L**, while we offer other specialized types tailored to meet specific technical requirements and requests. These options include impact modified variants such as **B33 P2 HI and B40 P2 HI**.



HIGH VISCOSITY
PROMYDE PA6

FILAMENT EXTRUSION

3D FILAMENTS, BCF, MULTI AND MICROFILAMENT

Our portfolio comprises products for spinning of both **mono and multifilament fibers**, used in applications such as carpets, fishing trimmer lines, grass trimmer wires or industrial fabrics.

Promyde® offers a **wide range of viscosities** to meet our customer's needs in terms of tenacity, break strength and elongation.

Promyde B33 is our **medium viscosity** product for general purpose applications such as fishing nets, industrial filaments, ropes, etc. For medium or high thickness diameters (up to 5mm), our **high viscosity** products **Promyde B36, B40 and B50** are the materials of choice.

NUREL supplies specific products for **increased compatibility** with acids (improved dyeing) and for an **improved softness** and flexibility like **B940L**.

Promyde B730 is recommended for **3D printing filament** extrusion due to their **high flexibility** and **improved adherence** between layers on 3D printing parts.

PROMYDE® PROPERTIES

POLYAMIDE 6 FOR EXTRUSION

PHYSICAL PROPERTIES	CONDITIONS	TEST METHOD	UNIT	B33 L (LN)	B36 L (LN)	B40 L (LN)	B50 L (LN)	B33 P2 G25 BL01	B33 P2 G30
Density	23 °C	ISO 1183	g/cm³	1.13	1.13	1.13	1.13	1.32	1.36
Viscosity Number	25 °C	ISO 307	cm³/g	203	228	263	350	190	190
Moisture absorption	23 °C/50% r.h.	ISO 62	%	3.0	3.0	3.0	3.0	2.2	2.1
Water absorption	23 °C/saturation	ISO 62	%	9.5	9.5	9.5	9	6.8	6.7
Melt volume rate	275 °C / 5 kg	ISO 1133	cm³/10min	35	25	14	7.5	30	15
Haze (thickness 1.5mm)	Mold Tº=30°C	ASTM DM1003	%	-	-	-	-	-	-
Flammability	1.5 mm	UL-94	Class	V-2	V-2	V-2	V-2	HB	HB
Glow wire flammability index	1.5 mm	IEC 60695-2-12,12	°C	-	-	-	-	-	-
Glow wire ignitability temperature	1.5 mm	IEC 60695-2-12,12	°C	-	-	-	-	-	-
MECHANICAL PROPERTIES			(dry/cond.)*						
Tensile modulus	23 °C, 1 mm/min	ISO 527-1/-2	MPa	3,300 / 1,100	3,300 / 1,100	3,300 / 1,100	2,870 / 1,200	8,200 / 5,500	9,300 / 6,200
Tensile strength	23 °C, 50 mm/min	ISO 527-1/-2	MPa	85 / 40	85 / 40	85 / 40	80 / 40	160 / 100	190 / 110
Elongation at yield	23 °C, 50 mm/min	ISO 527-1/-2	%	4.0 / 25	4.0 / 25	4.0 / 25	4.0 / 25	- / -	- / -
Elongation at break	23 °C, 50 mm/min	ISO 527-1/-2	%	50 / > 50	60 / > 50	70 / > 50	14 / > 25	3.5 / 6.0	3.0 / 5.0
Flexural modulus	23 °C, 2 mm/min	ISO 178	MPa	2,800 / 1,000	2,800 / 1,000	2,800 / 1,000	2,500 / 1,000	7,400 / 4,200	8,000 / 5,100
Flexural strength	23 °C, 2 mm/min	ISO 178	MPa	110 / 30	110 / 30	110 / 30	110 / 30	230 / -	250 / 180
Charpy unnotched impact strength (1)	23 °C	ISO 179/1eU	kJ/m²	NB / NB	NB / NB	NB / NB	NB / NB	75 / 95	85 / 95
	-30 °C	ISO 179/1eU	kJ/m²	-	-	NB	NB	-	75
Charpy notched impact strength	23 °C	ISO 179/1eA	kJ/m²	6.0 / 35	6.2 / 35	6.4 / 35	8.5 / 40	7.5 / 25	13 / 25
	-30 °C	ISO 179/1eA	kJ/m²	-	4.7	6.0	7.0	-	10
THERMAL PROPERTIES									
Melting temperature (DSC)	10 °C/min	ISO 3146	°C	222	222	222	222	222	222
Heat Deflection Temperature (HDT)	1.8 MPa	ISO 75-1/-2	°C	65	65	65	65	210	210
	0.45 MPa	ISO 75-1/-2	°C	197	197	197	195	215	215
				Unreinforced				Reinforced	

(1) NB: No break. | * dry = dry as moulded / cond. = conditioned according to ISO 1110

IMPORTANT: This list is not exhaustive. We can adapt any additive or reinforcement concentration to meet your requirements.

B33L UV HS	B40 L UV HS	B40 P2 FLX HI	B40 P2 FLX HI FC	B33 P2 HI	B40 P2 HI	B50 P2 HI	B40 P2 UO	B40 P2 UO UV HS	B936 L	B740 L	B640 L
1.13	1.13	1.08	1.03	1.08	1.08	1.08	1.18	1.18	1.11	1,15	1.09
200	263	200	–	200	–	–	263	263	–	–	–
3	3.0	2.7	1.6	3.0	2.4	2.4	2.5	2.5	3.0	3.0	2.0
9.5	9.5	9.5	5.5	9.5	7.6	7.6	9.0	9.0	9.5	9.5	6.5
45	14	7.0	–	30	9.0	7.0	14	14	30	–	–
–	–	–	–	–	–	–	–	–	7.0	3.0	3.0
V-2	V-2	HB	HB	HB	HB	HB	V-0	V-0	V-2	V-2	V-2
–	–	–	–	–	–	–	960	960	800	800	775
–	–	–	–	–	–	–	775	775	675	825	775
2,700 / 1,100	3,000 / 1,100	650 / 500	700 / 500	2,100 / 1,000	2,000 / 900	2,100 / 900	3,900 / 1,600	3,900 / 1,600	2,600 / 1,000	2,900 / 1,500	1,900 / 480
80 / 40	80 / 40	50 / 35	24 / 20	60 / 35	60 / 35	60 / 35	90 / 45	90 / 45	75 / 35	50 / 30	55 / 32
4.0 / 25	4.0 / 25	– / –	24 / >50	5.0 / 35	– / –	4.0 / 25	4.0 / 25	4.0 / 25	4.0 / 40	–	4.0 / 19
50 / > 50	50 / > 50	>190 / > 200	>25 / >50	100 / > 50	100 / > 50	100 / > 50	70 / > 50	70 / > 50	140 / > 50	1.9 / >20	260 / 260
2,600 / 1,000	2,800 / 1,000	590 / 450	550 / 350	1,600 / 1,000	1,700 / 800	1,750 / 800	3,500 / 1,300	3,500 / 1,300	2,500 / 1,000	2,800 / 1,300	1,600 / 400
105 / 30	110 / 30	24 / 20	20 / 15	60 / 30	65 / 20	70 / 20	116 / 50	116 / 50	100 / 30	112 / 60	60 / 22
NB / NB	NB / NB	NB / NB	NB / NB	NB / NB	NB / NB	NB / NB	70 / –	70 / –	95 / NB	139 / NB	NB / NB
NB / –	NB	NB	NB	NB	NB	NB	60	60	–	–	–
7.0 / 35	6.4 / 35	115 / NB	70 / NB	95 / NB	100 / NB	120 / NB	5.0 / 20	5.0 / 20	5.0 / 30	6.8 / 40	8.5 / 120
6.0 / –	6.0	16 / –	–	70	30	40	–	–	–	–	–
222	222	222	222	222	222	222	222	222	200	185	165
65	65	50	50	50	50	50	80	80	55	60	35
197	197	–	–	–	–	–	200	200	180	60	35

Heat & UV stabilized
UL83

Flexible
Impact modified
Food contact

Impact modified

Flame retardant
Heat & UV stabilized

Special

Nomenclature

L: Lubricated FLX: Plasticized G: Glass Reinforced UV: UV Protection N: Nucleated HS: Heat Stabilized HI: Impact Modified UO: Flame Retardant

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