

HIGH PERFORMANCE  
POLYMERS

# Thermoplastic Resins for Sub Sea Cables



**ARKEMA**  
INNOVATIVE CHEMISTRY



### 3 **KYNAR**<sup>®</sup> BY ARKEMA

#### **PVDF and PVDF copolymers**

- Fluoropolymer resins
- Chemical resistance
- Flame and smoke resistance
- Durability
- Ease of processing



### 5 **RILSAN**<sup>®</sup> BY ARKEMA

#### **Long Chain Polyamides**

- High performance polyamide resins, toughness
- Flexibility
- Chemical resistance
- Low moisture absorption



### 7 **ORGALLOY**<sup>®</sup> BY ARKEMA

#### **Polyamide Alloys**

- Low moisture absorption
- Lightweight
- High performance to cost ratio



**AN EXTREME WORLD NEEDS EXTREME PROTECTION.**



**INNOVATION**  
(BIO-BASED)



**SUSTAINABILITY**



**EXTREME  
WEATHERABILITY**



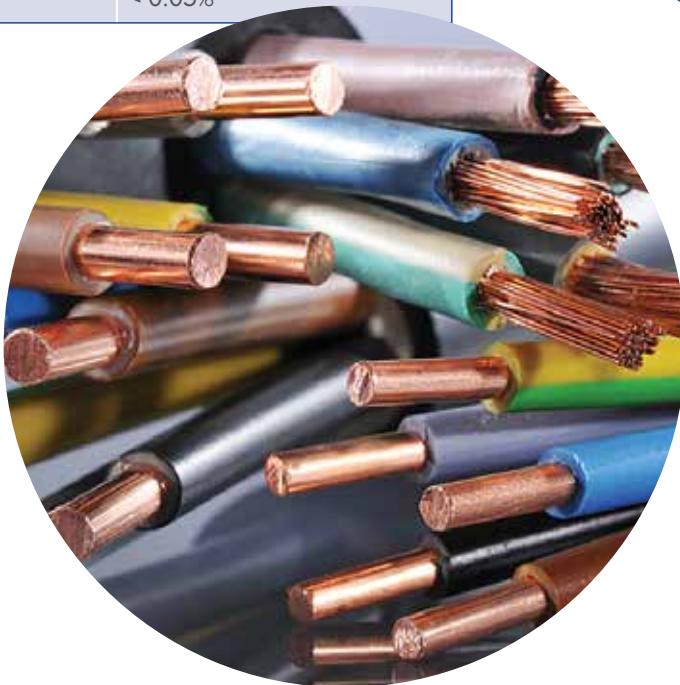
**DURABILITY**



# KYNAR® PVDF

Cable jackets requiring extremely low moisture absorption, excellent abrasion resistance flexibility, high and low temperature performance, low shrinkage, chemical/UV/radiation resistance are made with Kynar® PVDF resin.

PROPERTY	VALUE
DENSITY	1.78 g/cm <sup>3</sup>
UL RATING	Yes
MELT POINT	100 – 150° C
DIELECTRIC STRENGTH	0.8 – 1.6kV/mil
FLEX MOD	36 – 335 Kpsi
GLASS TRANSITION	-40° C
SHRINKAGE	0.4 – 1.0%
FLAMABILITY RATING (UL 94)	V – 0
LIMITING OXYGEN INDEX	36 – 95
ABRASION RESISTANCE	5 – 20 mg/1,000 cycles
MOISTURE RATING	< 0.05%



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**DURABILITY**

## HIGH PERFORMANCE SUB SEA CABLE APPLICATION EXAMPLES

<b>TUBE ENCAPSILATED</b>	<b>SEISMIC CABLE</b>	<b>COPPER CABLE</b>	<b>FIBER OPTIC CABLE</b>	<b>HEAT SHRINKABLE TUBING</b>	<b>INDOOR/ OUTDOOR FO CABLES</b>
					
<b>CONVOLUTED TUBING AND CONDUITS</b>	<b>CABLE TIES</b>	<b>FURCATION BUFFER TUBING</b>	<b>CABLE CONNECTORS</b>	<b>DOWN HOLE AND MINING CABLES</b>	
					



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**DURABILITY**

# RILSAN® PA11

Rilsan® PA11 resin is a tough, yet light weight bio-based resin frequently used as a cable jacket or cladding. It has good chemical, abrasion, impact, and temperature resistance. Moisture absorption is very low.

PROPERTY	VALUE
DENSITY	1.03 g/cm <sup>3</sup>
UL RATING	Yes
MELT POINT	180 – 190° C
DIELECTRIC STRENGTH	580 kV/mil
FLEX MOD	157 Kpsi
GLASS TRANSITION	46° C
SHRINKAGE	0.4 long. 0.8 transv.%
ABRASION RESISTANCE	15 – 25 mg/1,000 cycles
MOISTURE RATING	0.8%



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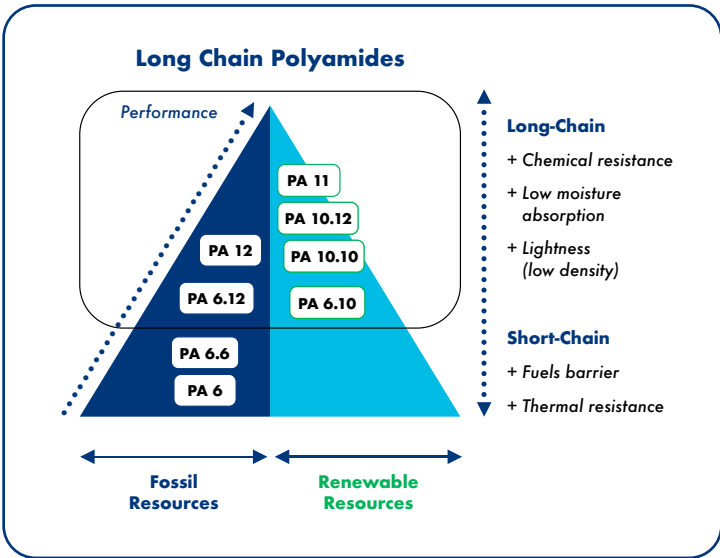
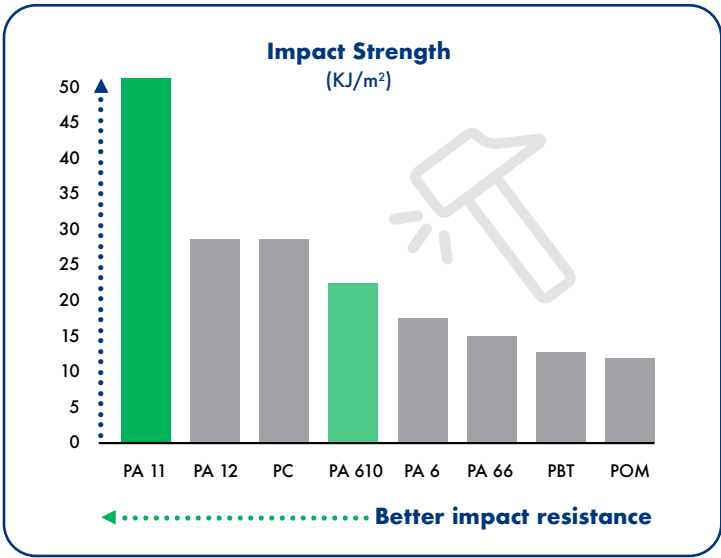
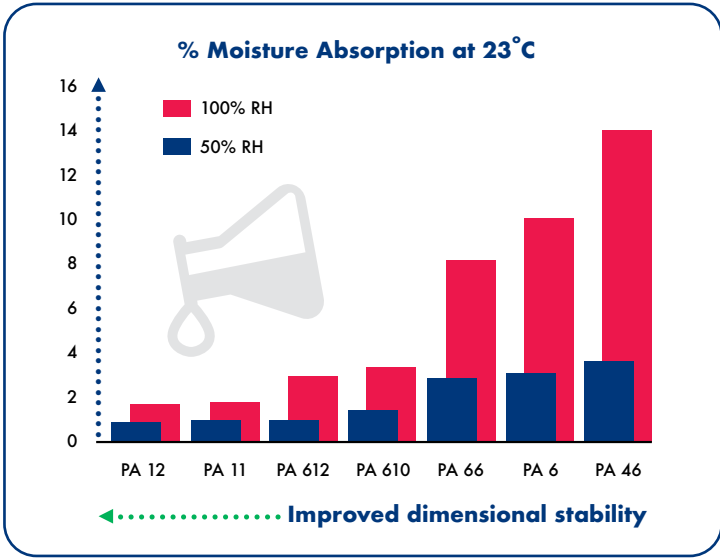
**SUSTAINABILITY**



**EXTREME  
WEATHERABILITY**



**DURABILITY**



		PA 11	PA 12
<b>SPECIFIC GRAVITY</b>	<b>DENSITY</b>	<b>1.03</b>	<b>1.01</b>
DIELECTRIC CONSTANT		++	++
TEMPERATURE INDEX	3,000h	125	100
LOW TEMPERATURE	Cold Wind Test	-40	-40
ELONGATION	Stretch	>300	>300
IMPACT STRENGTH	(KJ/M³)	50	27
OIL	Resistance to	++	++
FUEL	Resistance to	++	++
ACIDS	Resistance to	+	+
FLEX MODULUS (MPa)	Flexibility	320 -1,100	320 -1,100
ABRASION		++	++
PROCESSABILITY	Processability	Good	Good
SHORE D	Hardness	D63	D63

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**SUSTAINABILITY**



**EXTREME WEATHERABILITY**



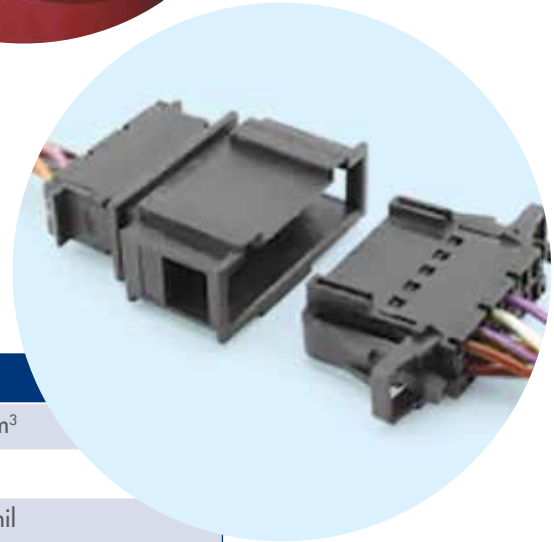
**DURABILITY**



# ORGALLOY® (PE/PA ALLOY)

A tougher version of PA6 or PA66

- ❖ Low density – 1.04
- ❖ Thermal resistance
- ❖ Low moisture uptake: dimensional stability, constant properties
- ❖ High chemical resistance and barrier properties
- ❖ Easy processing, high productivity
- ❖ Compatibility with other polymers
- ❖ Low cost
- ❖ Halogen free



## POLYOLEFIN

- Easy processing
- No moisture uptake
- Inert to polar solvents
- Impact resistant

## POLYAMIDE 6 OR 6,6

- Mechanical strength
- Thermal resistance
- Barrier to HCs
- Chemical resistant to HCs

PROPERTY	VALUE
DENSITY	1.04 g/cm <sup>3</sup>
MELT POINT	220° C
DIELECTRIC STRENGTH	900 kV/mil
FLEX MOD	70 – 120 Kpsi
TENSILE STRENGTH @ BREAK	6,500 Psi
ELONGATION @ BREAK	>200%
MOISTURE RATING	0.8%

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**DURABILITY**



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