

ELASTOMERS

Europrene®

NBR

N / GRN / N OZO



versalis



Europrene[®]
NBR[®] N/GRN/N OZO

BACKGROUND

In the early '80s Versalis decided to relocate the production of acrylonitrile (ACN) - butadiene copolymers (also called Nitrile Rubber, or NBR) in Porto Torres-Italy plant.

An intense R&D activity allowed great improvements on the original performance of the polymer setting the benchmark for excellent compositional homogeneity of the polymer chain and for extremely low mould fouling. The current NPC is 33 KTPY.

PROCESS

The reaction is a continuous free-radical copolymerisation taking place in a water emulsion and at low temperature.

This process results in high molecular weight copolymers and a random distribution of monomers. Before coagulation, a non-staining antioxidant agent is added to the latex, in order to protect the polymer during drying and subsequent storage.

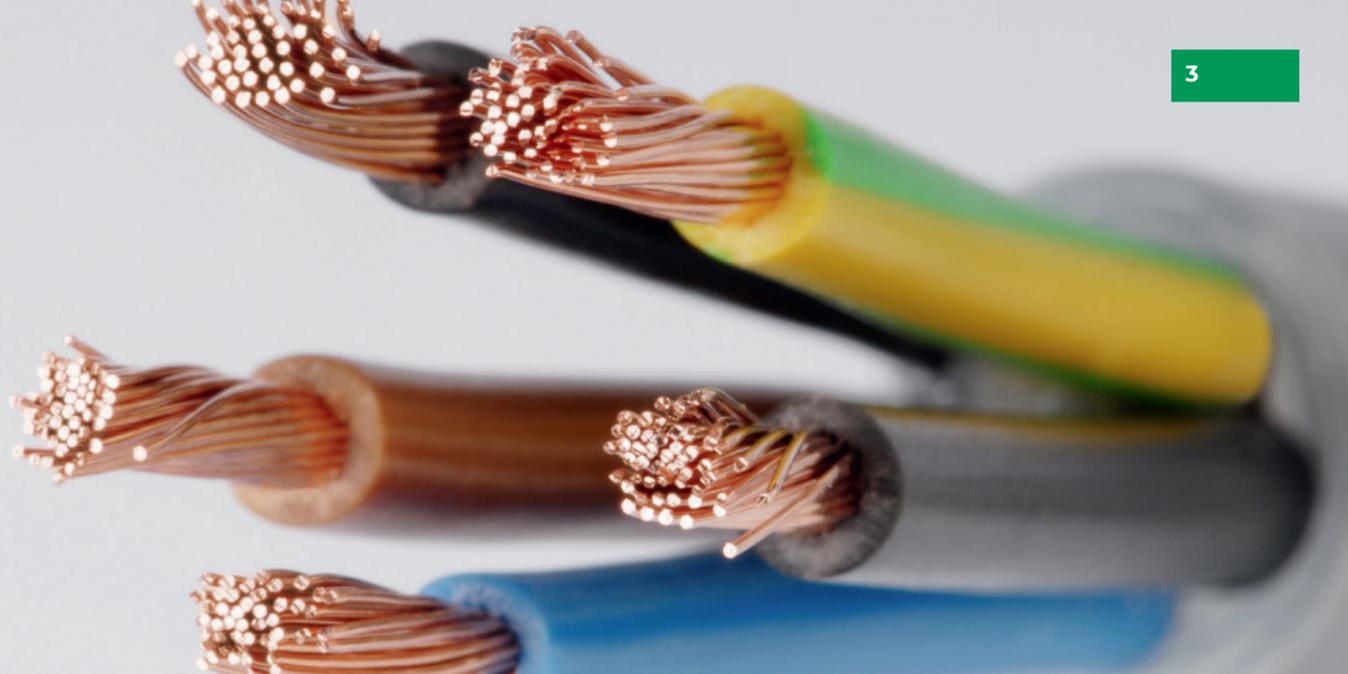
MAIN PROPERTIES

The main property of Europrene® N is its excellent resistance to aliphatic hydrocarbons, gasoline, oils and greases, as well as to a wide variety of chemical products, in a temperature range from -50 to +130°C.

This significant property depends upon the ACN content: the higher the ACN content the lower is the gas permeability, and the higher is the resistance to oils and grease and compatibility with polar plastics.

Increasing ACN content a worsening of cold flexibility is observed.

Thanks to its backbone high compositional homogeneity Europrene® N's shows the best possible trade-off between oil and low temperatures resistance.



GRADE SELECTION

The key criterion to be taken into account is the desired level of non-polar fluid resistance (or fluid permeability) that is a direct consequence of the ACN content.

The second criterion is the transformation technique: in case of injection moulding a low Mooney grade will be preferred, while for extrusion and calendaring a higher Mooney will be chosen instead. If we are dealing with mass productions or complicated injection moulded items, mould fouling is the first thing to be avoided, then Europrene® N GRN grades become the right choice. During the vulcanisation stage these grades show also fast speed and high cure state allowing effective cycle time reductions. If we are talking about outdoor items cracks may be caused by ozone and environmental condition, but prevention can be achieved by Europrene® N OZO grades.

These grades are blends of NBR and PVC "fluxed" properly to obtain the final properties required. Europrene® N, N GRN grades are identified by a numerical code (XXYY), where XX stands for the ACN content and YY for the Mooney viscosity. ACN content typical range is from 19% to 45% while Mooney viscosity typical range is from 30 up to 80 MU. Europrene® N OZO grades are identified by a numerical code (XXYY) where XX shows the percentage of NBR in the blend, and YY the ACN content of the NBR base.

NBR content ranges from 50% to 70%, while ACN content in NBR is between 28% and 39%.



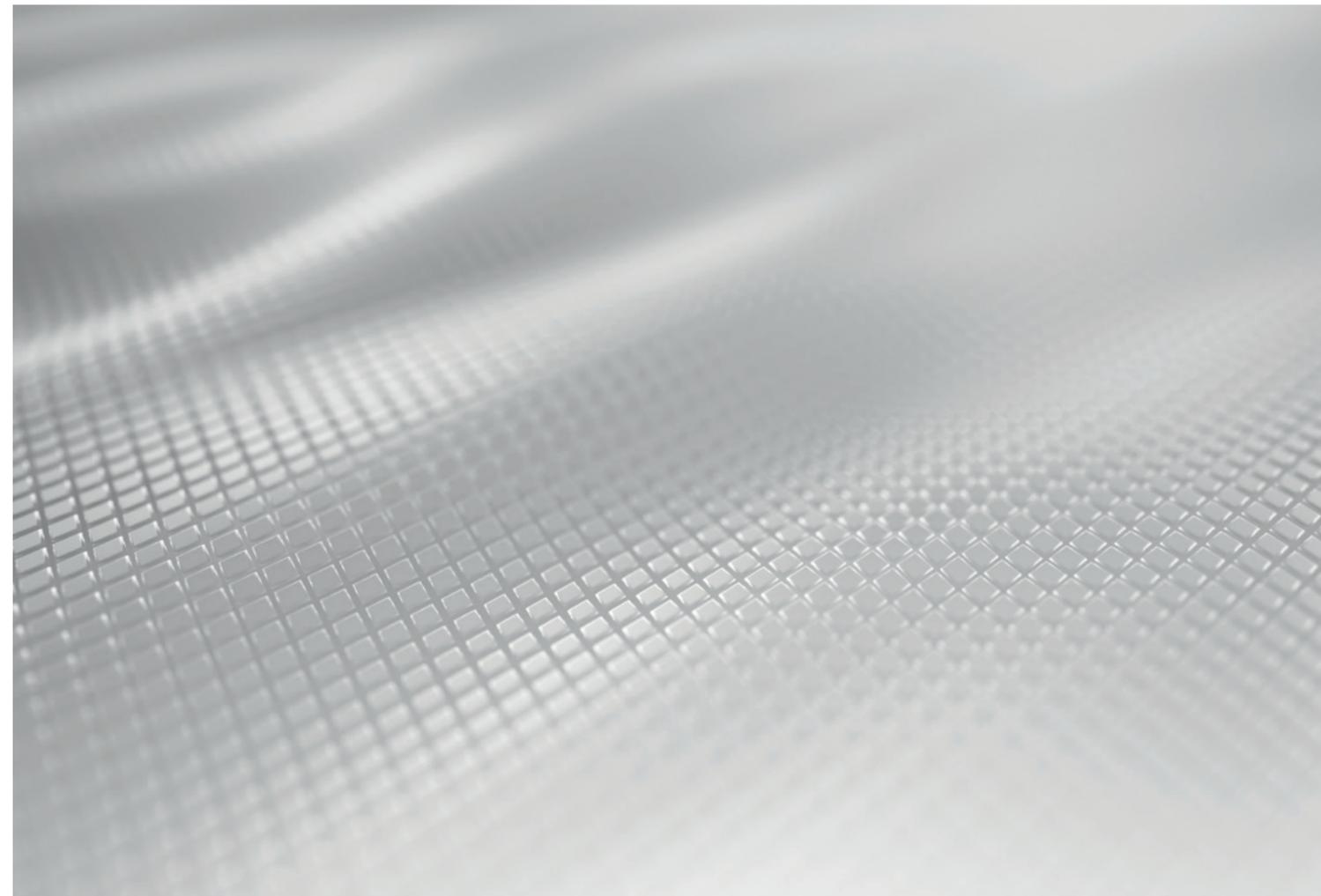
GRADE LIST

Acrylonitrile - butadiene rubber (NBR) - normal type

GRADE	ACRYLONITRILE CONTENT %WT	MOONEY VISCOSITY ML (1+4) 100°C	MAIN APPLICATIONS
Europrene® N 2845	28	45	Application requiring good processability, elasticity at low temperature and oil resistance
Europrene® N 2860	28	60	Application requiring elasticity at low temperature, oil resistance and high mechanical performances
Europrene® N 3330	33	30	Wide range of oil-resistant technical articles requiring good processability
Europrene® N 3345	33	45	Wide range of oil-resistant technical articles
Europrene® N 3360	33	60	Technical goods with high mechanical properties
Europrene® N 3380	33	80	Technical goods with high mechanical properties very good compression set and oil resistance
Europrene® N 3945	39	45	Wide range of technical articles requiring good processability and very high oil and fuel resistance
Europrene® N 3960	39	60	Application requiring very high oil and fuel resistance and excellent mechanical properties
Europrene® N 3980	39	80	Application requiring very high oil and fuel resistance and excellent mechanical properties
Europrene® N 4560	45	60	Technical goods with good mechanical properties and excellent oil and fuel resistance

Acrylonitrile - butadiene rubber (NBR) - green type

GRADE	ACRYLONITRILE CONTENT %WT	MOONEY VISCOSITY ML (1+4) 100°C	MAIN APPLICATIONS
Europrene® N 1945 GRN	19	45	Technical goods requiring oil resistance and very good low temperature flexibility. Food contact application
Europrene® N 2830 GRN	28	30	Grades with faster cure rate compared to Normal Types. Suitable for injection applications (low-mould fouling)
Europrene® N 2845 GRN	28	45	
Europrene® N 2860 GRN	28	60	
Europrene® N 2875 GRN	28	75	
Europrene® N 3330 GRN	33	30	
Europrene® N 3345 GRN	33	45	
Europrene® N 3380 GRN	33	80	
Europrene® N 3945 GRN	39	45	



NBR - PVC - BLEND

GRADE	NBR/PVC	ACRYLONITRILE CONTENT %WT	MOONEY VISCOSITY ML (1+4) 100°C	MAIN APPLICATIONS
Europrene® N OZO 7028	70/30	19.5	75	Wide range of technical articles requiring good ozone and oil resistance
Europrene® N OZO 7028/60	70/30	19.5	60	Wide range of technical articles requiring good ozone and oil resistance. Enhanced processability
Europrene® N OZO 7033	70/30	23	75	Ozone resistant articles requiring higher oil resistance
Europrene® N OZO 7033/60	70/30	23	60	Ozone resistant articles requiring higher oil resistance. Enhanced processability
Europrene® N OZO 7039	70/30	27	75	Applications requiring very high oil and new gasolines resistance
Europrene® N OZO 5033	50/50	16.5	70 ⁽¹⁾	Special NBR/PVC grades for extrusion and injection moulding applications. Outstanding ozone resistance

(1) ML (1+4) 121°C



STORAGE AND PACKAGING

Europrene® grades have to be stored in vented, dry areas at temperature between 20°C and 30°C, avoiding direct sunlight.

GRADE	PACKAGING DESCRIPTION	CRATE DIMENSION (MM)	NOMINAL NET WEIGHT (kg)	BALE WEIGHT (kg)	BALE DIMENSION (mm)	BALES TOTAL	BALES X LAYER
Europrene® N and N GRN	Wooden crate	1090x1250x h1450	1200	30	550x350x h190	40	5x8
Europrene® N	Wooden crate	1090x1250x h1100	900	30	550x350x h190	30	5x6
Europrene® N OZO	Cardboard box	970x1145x h1050	750	25	530x350x h140	30	5x6
Europrene® N 2875 GRN	Wooden crate IPPC	1090x1250x h1450	1125	25	550x350x h160	45	5x9

Versalis in the world



HEADQUARTERS

San Donato Milanese, Milan (Italy)

LICENSING

Algeria
Brazil
China
Egypt
India
Iran
Japan
Malaysia
Portugal
Qatar
Romania
Russian Federation
Slovak Republic
South Korea
Spain
Taiwan
USA
Venezuela

R&D

ITALY
Ferrara
Mantua
Novara
Porto Torres
Ravenna
Rivalta Scrivia

SALES NETWORK

Austria
Belgium
China
Congo
Czech Republic
Denmark
France
Germany
Ghana
Greece
Hungary
India
Italy
Mexico
Poland
Portugal
Romania
Russian Federation
Singapore
Slovak Republic
South Korea
Spain
Switzerland
Sweden
Turkey
United Arab Emirates (VPM, a joint venture with Petrochem/Mazrui Energy Services)
UK
USA

PLANTS

ITALY

Brindisi:
- Steam cracking
- Aromatics
- Polyethylene

Crescentino:
- Bio-ethanol

Ferrara:
- Elastomers
- Polyethylene

Mantua:
- Intermediates
- Styrene
- Styrenics

Porto Marghera:
- Recycled polymers

Porto Torres:
- Elastomers
- Renewable chemistry

Priolo:
- Steam cracking
- Aromatics

Ragusa:
- Polyethylene EVA
- Butadiene

Ravenna:
- Elastomers

UK

Grangemouth:
- Elastomers

FRANCE

Dunkerque:
- Steam cracking
- Polyethylene EVA

GERMANY

Oberhausen:
- Polyethylene EVA

HUNGARY

Százhalombatta:
- Styrenics

SOUTH KOREA

Yeosu (LVE, a joint venture with Lotte Chemical):
- Elastomers

Versalis is focused on establishing itself as a solution provider, offering a range of increasingly market-oriented products at an international level. The company is present in the APAC region through its Shanghai-based subsidiary, Versalis Pacific Trading; in Mumbai, India; in Singapore; and in South Korea through LVE, a joint venture with Lotte Chemical.

Versalis can also count on subsidiaries Versalis Americas – with offices in Houston, Texas – and Versalis Mexico. Furthermore, Versalis serves the oil and gas industry with offices in Ghana and in Congo, with its portfolio of oilfield chemicals. Thanks to a widespread sales network, distributors and sales agents, Versalis can serve all markets worldwide.



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