

ELASTOMERS

Europrene

NEOCIS® – AGON®

BR



versalis



Europrene
NEOCIS® – AGON® BR

BACKGROUND

Versalis produces a range of Polybutadiene rubbers under the trademarks Europrene Neocis[®], Agon[®]. Europrene Neocis[®] is a high 1.4-cis polybutadiene manufactured at the Ravenna plant in Italy. Europrene Neocis[®] production started in 1984 at the Grangemouth plant in UK. Production was transferred to Ravenna, Italy in 1994. During the years that followed, significant improvements were made to the Ravenna plant. A second production line was installed in 2008 enabling de-bottlenecking and a doubling of production from 40 to 80 kton per year.

PROCESS

Versalis polybutadienes are produced by solution polymerization in an aliphatic solvent, thus greatly improving the environmental friendliness of the whole process. All Versalis BR grades are produced by a continuous process with the selection of the appropriate catalyst system determining the (micro)structure of the final product: Europrene Neocis[®] is manufactured using a proprietary, stereospecific, Ziegler-Natta catalyst based on the rare earth metal Neodymium, allowing a polybutadiene with the highest cis content to be obtained.

SUSTAINABILITY

All grades in portfolio are available with ISCC Plus Certification: “Bio Attributed (BA)” and “Bio-Circular Attributed (BCA)” products made from bio naphtha, and “Circular Attributed (CA)” made with a “recycled oil” (r-Oil), a pyrolysis oil obtained from the chemical recycling process of mixed plastic waste.

BA, BCA and CA raw materials can be used in production processes together with traditional raw materials. In order to attribute sustainability characteristics to the final product, Versalis applies the Mass Balance approach, an acknowledged methodology that ensures that the sustainability characteristics of the alternative raw material, mixed with traditional naphtha, correspond to those of the final product.

They guarantee identical performance, quality and properties, as they do not differ in chemical composition and physical-mechanical performance from standard products.

MAIN PROPERTIES

Butadiene rubber with high 1.4-cis (Europrene Neocis®) microstructure, represents an important family of synthetic elastomers. Commercial polybutadienes can be grouped into two basic types according to their microstructure.

High 1.4-cis polybutadiene is made using stereospecific Ziegler-Natta catalysts. Polybutadiene made with Neodymium (Nd), Titanium (Ti), Nickel (Ni) and Cobalt (Co) based catalyst systems also belong to this family;

Vulcanised BR compounds behave similarly to styrene-butadiene rubber (SBR). They show more heat resistance than natural rubber. They have relatively poor resistance to oil and solvents. Polybutadiene is generally employed in blends with NR or other synthetic elastomers (mainly IR, SBR and NBR), conferring to the final product its typical properties, i.e.:

- excellent abrasion and wear resistance;
- excellent dynamic fatigue resistance (or flex resistance) and therefore an improved cut growth resistance;
- low hysteresis, i.e. low heat build up and low rolling resistance;
- high elasticity, in particular at low temperature;
- good reversion resistance in comparison to NR;
- improved compound flow.

The contribution of such properties to the compound depends on the blend ratio with the other elastomers mentioned and on the macrostructure of the polybutadiene itself.





GRADE SELECTION

Europrene Neocis[®] is characterized by having a very high 1.4-cis content (typical value >95%) and low 1.2-vinyl content (typical value 0.8%). Other notable characteristics are a very high polymer chain linearity and a molecular weight distribution described as medium to broad. Europrene Neocis[®] is produced in three grades: BR 40, BR 450, BR 60, with the first two digits identifying the Mooney viscosity of the product.



GRADE LIST

High cis types

GRADE	CIS CONTENT %WT	MOONEY VISCOSITY ML (1+4) 100°C	STABILIZER	MAIN APPLICATIONS
Europrene Neocis® BR 40	97	43	Non staining	Tyre tread and sidewall, camelback, conveyor belts, technical goods, hoses, golf balls
Europrene Neocis® BR 60	97	63	Non staining	
Europrene Neocis® BR 450	95	44	Non staining	
Europrene Neocis® BR X 61 EP	97	60	Non staining	Tyre tread and sidewall, conveyor belts, technical goods, hoses, golf balls
Agon® HCIS X41HP	97	44	Non staining	High performance tyre tread and sidewall. Recommended for silica tread compounds containing functionalised polymers

INTERNATIONAL
SPECIAL SERVICE
P POSTAGE PAID
FIRST-CLASS PACKAGE
FROM: Green Company, LLC
2000 Trade Street
Big City, WI 54701
TO: Mr. Customer
Green Street
Smallville, KS 12345
DELIVERY CONFIRMATION
356 9435 2891 8726 6196 1289 8177 53
Electronic Rate Approval #12882200



STORAGE AND PACKAGING

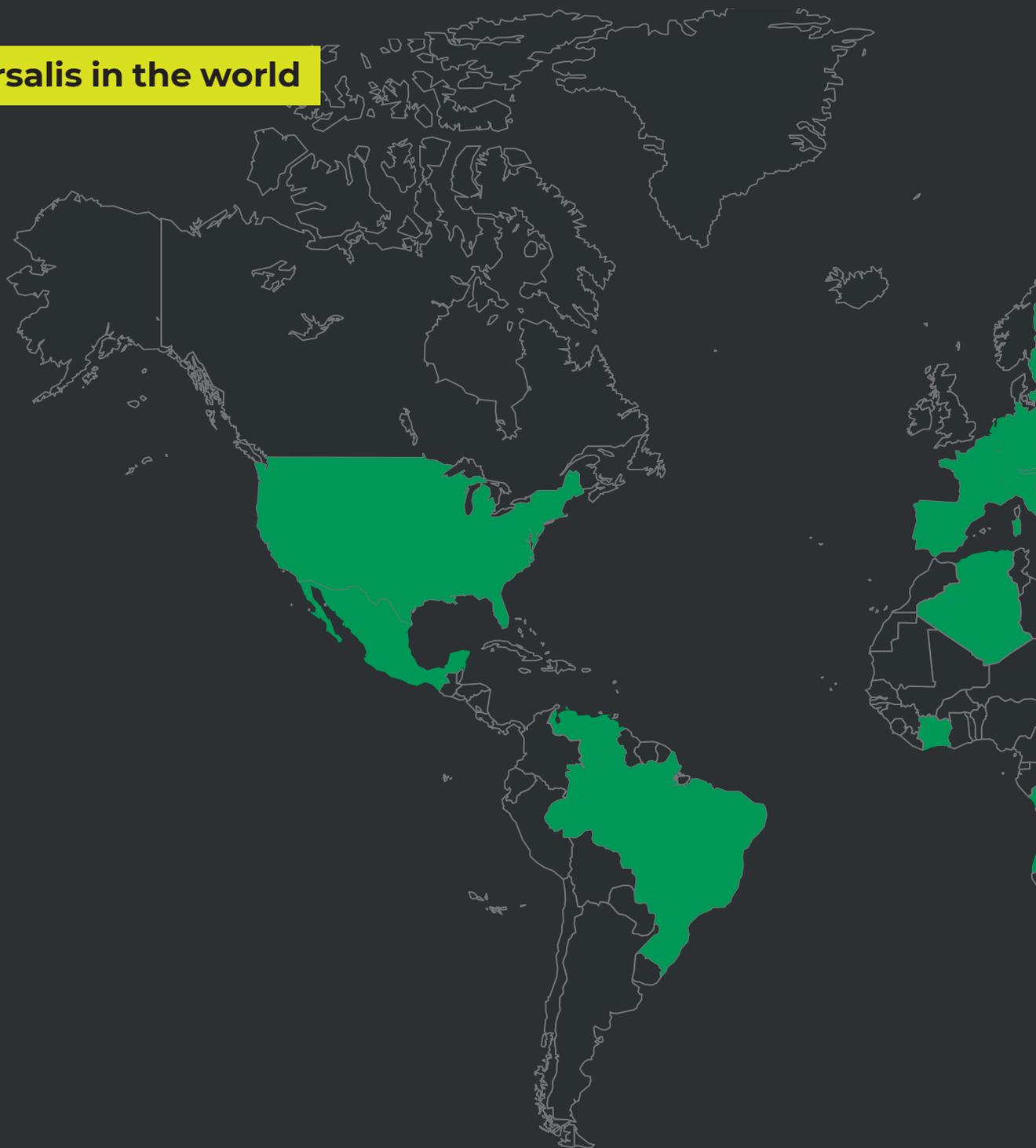
Europrene Neocis® and Agon® should be stored in a vented, dry area at a temperature between 20°C and 30°C with the avoidance of exposure to direct sunlight. The shelf life of those grades is 18 months minimum.

GRADE	PACKAGING	DIMENSION (mm)	NOMINAL NET WEIGHT (kg)	
Europrene Neocis® BR 40	Returnable metal crate	1465x1150xh1123	1260	
Europrene Neocis® BR 40	Wooden crate	1530x1145xh1090	1050	
Europrene Neocis® BR 60	Returnable metal crate	1465x1150xh1123	1260	
Europrene Neocis® BR 60	Wooden crate	1530x1145xh1090	1050	
Europrene Neocis® BR 450	Returnable metal crate	1465x1150xh1123	1260	
Europrene Neocis® BR 450	Wooden crate	1530x1145xh1090	1050	
Europrene Neocis® BR X 61 EP	Returnable metal crate	1465x1150x1123	1260	
Europrene Neocis® BR X 61 EP	Wooden crate	1530x1145xh1090	1050	
Agon® HCIS X41HP	Returnable metal crate	1465 x 1150 x H1123	1260	



	PHYSICAL FORM	BALE DIMENSION (mm)	BALES WEIGHT (kg)	BALES TOTAL	BALES X LAYERS	FILM TYPE
	Bales	700x350xh180	35	36	6x6	PE
	Bales	700x350xh180	35	30	6x5	PE
	Bales	700x350xh180	35	36	6x6	PE
	Bales	700x350xh180	35	30	6x5	PE
	Bales	700x350xh180	35	36	6x6	PE
	Bales	700x350xh180	35	30	6x5	PE
	Bales	700x350xh180	35	36	6x6	PE
	Bales	700x350xh180	35	30	6x5	PE
	Bales	660 x 350 xh200	35	36	6x6	PE

Versalis in the world



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.



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

FRANCE
Dunkerque:
- Steam cracking
- Polyethylene EVA

GERMANY
Oberhausen:
- Polyethylene EVA

HUNGARY
Százhalombatta:
- Styrenics

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



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