

Matrilox[®] portfolio for Bio-Plasticizers

Move forward
on performance
and sustainability



Matrilox® portfolio for Bio-Plasticizers



Matrica is a flagship of oleochemistry thanks to its production plant and research center, both located in Porto Torres (Sassari-Italy). Matrica leverages on the molecular complexity of the vegetable raw materials to produce chemicals with high added value, through an innovative and proprietary technology with low environmental impact.

The product range is wide and diversified, accounting for a low-boiling point fraction (LF), constituted by fatty acids, as azelaic, pelargonic and a mixture of C5-C9 acids, and for a high-boiling point fraction (HF), composed by a mixture of C12-18 fatty acid and glycerides. Each fraction has its esterification line and the presented bio-plasticizers are the results of the HF esterification.

HF esters

Product	Trade name	Appearance @20°C	Density @20°C [kg/m³]	Viscosity @40°C [mm²/s] (ASTM D7042-14)	Pour point [°C] (ASTM D97)	Flash point [°C] (ASTM D93)	Biogenic content (ASTM D6866-22)
n-butanol esters	PF801E	Dark-brown viscous liquid	970	25 - 60	≤ 15	≥ 180	82%
NPG esters	PD204P	Amber oily liquid	955	30 - 40	≤ -4	≥ 170	68%

Matrica offers a portfolio of innovative bio-sourced plasticizers and extender oils specifically designed for the rubber industry.

Matrilox® plasticizers are based on complex mixture of triglycerides and ester of polyols, comprising oligomeric structures. Part of carboxylic acid residues is esterified with alcohols.

Matrilox® plasticizers provide a high-performance, non-toxic, eco-sustainable alternative to partially or totally replace traditional fossil process oils.

Matrilox® plasticizers, characterized by high molecular weight and low volatility, make it possible to achieve excellent plasticizer efficiency and thermal stability.



Matrilox® PF801E can be used either for the production of oil-extended rubbers like SBR and BR, or, when properly formulated, as free oils in the production of rubber compounds. Matrilox® PD204P has been engineered to be highly compatible with specialty elastomers such as nitrile rubbers (NBR), polychloroprene (CR) and poly(vinyl chloride) (PVC).

The peculiar low glass transition temperature of Matrilox® bio-plasticizers provide an additional tool to rubber industry to develop compounds for low temperature applications.

Matrilox® PF801E and PD204P show lower volatility compared to traditional fossil oils with an Inflection Point higher than 310°C and ending their evaporation at around 500°C.

The low unsaturation level, together with chemical modification at the bio-refinery stage, strongly reduces the interaction with the compounding ingredients which typically affects traditional vegetable oils. The drop-in replacement of fossil reference oils is then tuned with only minor adjustments to the cure package.

NBR Compound

Matrilox® plasticizers show similar behaviour compared with standard fossil ones except for better viscoelastic properties at low temperatures.

NBR Compound

Europrene® N3380

+70 phr of CB +15 phr loose oil

Indexed value
The higher the better

— Fossil references (ASE)
— Fossil alternative (DINP)
— PD204P
— PF801E



SBR Compound

Matrilox® plasticizers show a higher plasticization effect compared with standard fossil ones, thus allowing to reduce their dosage. The slight reduction of the mechanical properties can be easily overcome with a proper adjustment of the vulcanization package.

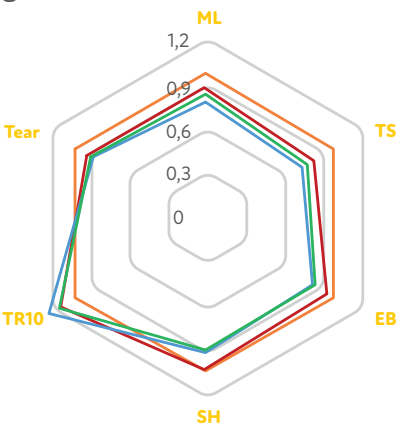
SBR Compound

Europrene® 1502

+50 phr of CB +20 phr CaCO₃
+ 40 phr loose oil

Indexed value
The higher the better

— Fossil references (TDAE)
— Fossil alternative (Naphthenic)
— PD204P
— PF801E





Matrica: the integrated platform for chemistry from renewable sources.

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