

PROCESSING OILS

FOR TYRE MANUFACTURERS



PARAMO

MES 15 PRODUCT DESCRIPTION

The process oil named MES 15 is an oil designed as a softener for the production of SBR rubbers and their mixtures used for modern tyres manufacture. It is a dark-green, medium viscosity oil type obtained by solvent extraction refining. By its chemical composition, this oil belongs to the group of medium aromatic softeners – toxicologically safe process oils.

The raw material for the MES oil production is vacuum distillate. The distillate contains paraffins that must be removed from the oil in order to improve its pour point value.

The dewaxing process is conducted in the solvent dewaxing unit, where by the use of methyl ethyl ketone and toluene solvents the paraffins are removed. The pour point of such oil fluctuates at about -6 °C. Another process for the improvement of oil properties is solvent refining. In this unit, polycyclic aromatic hydrocarbons are removed up to the limit required by Directive 2005/69/EC of the European Parliament. In these terms, therefore, the content of all specified PAHs must be under 10 ppm and the content of benzo(a)pyrene under 1 ppm. At the same time, this oil meets the PCA condition by the IP 346 method for the content of DMSO extract at max. 3 % wt. The solvent refining process also improves the oil viscosity index, colour and oxidation stability.

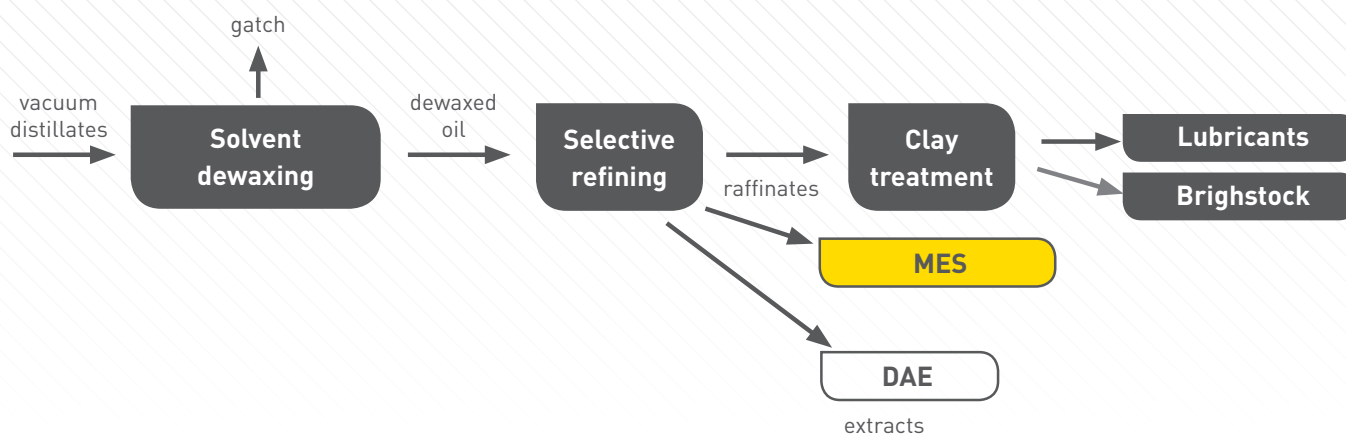
Parameter	MES 15	units
Density at 15 °C	922	kg/m ³
ISO colour	7,5	1
Refraction index at 20 °C	1,51	1
Flash point	232	°C
Pour point	-6	°C
Kinematic viscosity at 100 °C	15,4	mm ² /s
Kinematic viscosity at 40 °C	201,2	mm ² /s
Viscosity index	70,5	1
Aniline point	89,4	°C
Sulphur	1,78	% wt
Viscosity gravity constant	0,856	1
Refraction intercept	1,0505	1
PCA IP 346	2,2	% wt
Aromatic Carbon S non corr.	18	%

Parameter	MES 15	units
Naphthenic Carbon S non corr.	29	%
Paraffinic Carbon S non corr.	53	%
Aromatic Carbon S corr.	15,9	%
Naphthenic Carbon S corr.	22,8	%
Paraffinic Carbon S corr.	61,3	%
Distillation 5 % - 95 %	440-550	°C
Suma PAH 's	7,3	mg/kg
Benzo-a-pyrene	0,54	mg/kg
Clay gel analysis		
Saturates	41,7	%
Aromatics	48,1	%
Resins	10,2	%
Asphaltenes	0	%
Acid value/neutralization number	0,02	mg KOH/g

PRODUCTION OF PARAMO PROCESSING OILS

Process oils used as softeners for SBR rubbers and their mixtures used in the tyre manufacture are obtained by the solvent refining process (Fig.1). The refining process is based on extraction of polar substances into a suitable polar selective solvent. The solvent will then form a solution of more polar aromatic hydrocarbons and heterocyclic substances (extract).

Non-polar hydrocarbon types will not dissolve in this solvent and they create a raffinate. The non-polar part of the oil in the raffinate is less sensitive to the viscosity-temperature relationship (i.e. higher viscosity index) and low content of aromatically bound carbon, which is significant for lubricating oils. The polar part of the oil in the extract has a higher content of aromatically bound carbon (i.e. low viscosity index), which is suitable for process oils.



Process flow diagram for the production of MES and DAE oils in PARAMO, a.s.
For technological reasons, the solvent dewaxing process is placed before the selective refining process.

In the extraction process, solvents such as phenol (cresol), furfural and, most recently, N-methylpyrrolidone, mutually differ in their respective selectivity, dissolve power, thermal stability, extraction temperature, toxicity, etc. The solvent refining process is extended with the process of solvent dewaxing, the importance of which consists in the lowering of pour point by removal of solid paraffinic hydrocarbons.



Until recently, specific requirements of the rubber and rubber mixture manufacturers for the quality and properties of process oils, namely the content of aromatically bound carbon (CA) according to the Kurtz method, viscosity, viscosity-density coefficient (VDC), were covered by a suitable combination of DAE obtained in refining of various vacuum fractions.

Manufacturers also offer various options with modified physical properties (e.g. reduced viscosity levels) achieved through oil fractions with certain aromatic properties that already passed through the refining process (i.e. MES oil types).

	TRIUMF (DAE)	TRIUMF KR (DAE)	PARAMO MES 15
Specific gravity at 15°C [g/cm³]	960-990	>970	895-925
Sulphur content [wt. %]	<5	<4	<3
Kinematic visco at 40°C [mm²/s]	260-580	>600	150-230
Kinematic visco at 100°C [mm²/s]	13-20	>22	13-17
C(A) [%]	30-35	30-35	11-17
PAH [mg/kg]	>10	>10	<10
IP 346 [hm. %]	>3	>3	<3

Table 1: Process oils of PARAMO, a. s.





WHY CHOOSE PROCESSING OILS FROM PARAMO?

we are here since 1889, our company has a very long tradition representing certainty in the world of oils

for several years we have cooperated with a world leading tyre manufacturer on the development of environment friendly rubber softeners. Only after series of long-term tyres testing and their approval, the product was added to the assortment of PARAMO

thanks to well timed introduction to the market we have become the main supplier of MES type oil in many European tyre and rubber products manufacturing companies, acquiring valuable references

for our customer we are able to prepare wide range of process oils modifications i.e. specific requirements for viscosity, carbon aromates content, colouring, we are able to load at desired temperature etc.

we are significantly modernizing the technology of selective refining and we switch to a modern type of dissolving agent

processing oils from PARAMO are time-proven and well known by world leading tyre manufacturers and other rubber products producers for more than 10 years

TECHNICAL SUPPORT

Protocols of testing mandatory characteristics in independent laboratories

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES



Environmental Division - Europe

Protokol o zkoušce

Zakázka	: PR1105091	Datum vystavení	: 16.2.2011
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Projekt	: Analýza PAU v procesním oleji PARAMO MES 15	Stránka	: 1 z 2
Číslo objednávky	: 4500088405	Datum přijetí vzorků	: 14.2.2011
Číslo předávacího protokolu	: ----	Číslo nabídky	: PR2010PARAM-CZ0002 (CZ-123-10-0161)
Místo odběru	: ----	Datum zkoušky	: 14.2.2011 - 16.2.2011
Vzorkoval	: zákazník	Úroveň řízení kvality	: Standardní QC dle ALS ČR interních postupů

Poznámky

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Jméno oprávněné osoby

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1. The sum of eight PAH values (polyaromatic hydrocarbons) max. 10 mg/kg.



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