



RM – MATERIAL TECHNOLOGY

Report

RM

RM REF. NUMBER: 11 / 3520

CODEWORD: MAPKA 1 – Luke Oil Tornado T

Job no. / Cons. no.	: 347 263	Examination ordered by	: LUKEOIL Lubricants Company
PSP element	:	RM specimen no.	: CS / 20513
Machine type	:	RM consec. ref. no.	: IM 08089
Component designation	: Lube oil system	Customer/installation	:
Examined material	: Sample of fresh oil	Operating hrs/starts	:

REMIT

History: The Russian product LUKEOIL Tornado T 46 is an EP-additivated turbine oil based on API Group III which was formulated in collaboration with the additive producer RheinChemie.

Task: Testing the suitability of the product of viscosity class ISO VG 46 on the basis of an oil specimen (TP-22S) in accordance with the requirement profile of MDT lubricant specification DocNo. 10000494596. Apart from selected lubrication parameters, the additive balance and the oxidation protection thermal stability was tested in accordance with MAN LTAT (Lubrication Temperature Aging Test).

SUMMARY / RESULT

Findings (Annex):

- The product has a high viscosity index of > 130 and satisfies the lubrication requirements as per the MDT lubricant specification.
- The load carrying capacity of Tornado T 46 is shown in the product data sheet with an FZG factor of 10 which means that it is suitable for use in plants with a load gear unit.
- The elemental analysis shows sulphur and phosphorus containing additives of the base oil which is otherwise low in sulphur (API Group III < 300 ppm S). The product is free of organometallic compounds.
- At a value of approx. 1,800 minutes the oxidation stability (ASTM D 2272 - RPVOT) satisfies the more stringent requirements as per DIN 51515 Part 2 and those of the MDT specification.
- The RULER test shows an aminic and phenolic additivation.
- In the MAN LTAT the formulation above 120 °C already shows a tendency to form deposits which are due to the EP additivation and the additives which contain sulphur and sulphur/phosphorus. In case of thermal overload the oil shows a tendency to form deposits even at 150 °C in the short-term test. Even though the precipitation quantities at 150 °C are at a low level, they already contain oil carbon components in addition to the precipitation products which contain sulphur and phosphorus. At RT individual particles which are rich in carbon are indicative of a partial insolubility of the additive package in the base oil.

Result:

- In view of the thermal stability of LUKEOIL Tornado T 46 which is assessed as average, use of this turbine oil is recommended for plant units with moderate thermal load (≤ 100 °C).
- Optimization of the formulation in respect of temperature stability and solubility of the additive package is recommended, as this seems to have a negative effect on the good temperature stability of the base oil of API Group III.
- In view of its mixed base oils, product „LUKOIL Tornado T 32“ has to be tested separately for suitability in MDT plant units without load gear.

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Unless agreed upon otherwise, the examined material will be kept for 3 months.

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