Development of a new Hydraulic Fluid

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Not at least because of the increased environmental awareness of many consumers, environmentally friendly hydraulic fluids are often used in Germany like areas such as forestry or in maritime applications. According to EN ISO 6743-4 and DIN ISO 15380, hydraulic fluids of the classes HETG (native esters), HEES (synthetic esters), HEPR (mostly polyalphaolefins) and HEPG (polyglycols) are considered to be environmentally compatible /ISO03, OEC92, DIN01/. Against the background of the expensive raw materials and the potential competition with foodstuffs, the search for raw materials alternatives has been intensified in recent years.

IFAS is currently investigating so called Biopolymers. They have strong thickening properties when dissolved in water. Similar to polymer thickeners for mineral oil-based hydraulic fluids (HVLP), their technical suitability depends greatly on the stability with regard to shear stresses. Against the background, IFAS was set up a fluid aging test bench which exposes the fluid to near-application shear loads as far as possible. The test rig creates a pressure of 160 bar, at 10 l/min with a pressure-relief valve /Bus95/. For the experiments with water-based media, the fluid temperature is adjusted, for example, to 30 °C, in order to avoid cavitation effects. The presentation shows the development of the hydraulic test rig and first measurement results. They show a stability of a solution under hydraulic loads.

/ISO03/	DIN ISO	„Schmierstoffe, Industrieöle und verwandte Produkte,“ DIN ISO 15380, 2003
/OEC92/	OECD	„OECD Guidelines For The Testing of Chemicals, Ready Biodegradability,” OECD 301, 1992
/DIN01/	DIN EN	„Lubricants, industrial oils and related products – Classification – Part 4: Family H (Hydraulic Systems)”, 2001
/Böt14/	Böttger, Michael	„Marktanalyse für den Bereich der Bioschmierstoffe,“ Gülzower Fachgespräche, Band 50, Fachagentur Nachwachsende Rohstoffe e.V., Gülzow, 2014
/Bus95/	Busch, Christian	„Untersuchung und Analyse der Eigenschaften einer rapsölbasischen Flüssigkeit in ihrer Funktion als hydraulisches Druckübertragungsmedium,“ Dissertation RWTH Aachen University, Aachen, 1995

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