## Summary

Basic investigations made on a rape oil base pressure fluid were presented within the scope of the preceding work. The experimental work was preceded by theoretical studies and analyses Characteristics and variations of characteristics could be determined by means of various different testing procedures. These investigations included both, the service behaviour with regard to oxidative, thermal and hydrolytical stability and the wear resistance imparted by the fluid.

It could be shown that essential characteristics of the rape oil base fluids are clearly differing from the known patterns of behaviour shown by mineral oil base pressure fluids. As assessed by stability criteria, the vegetable triglycerides show distinct drawbacks due to their chemical strukture. Oxidative reactions result in an increased viscosity and in a formation of acidic reaction products. The fatty acid spectrum changes towards an increasing saturation of double bonds. Considerable improvements were attained in this respect by a well-aimed use of additives, were considered.

The thermal behaviour was investigated for both, high and low temperatures. At high temperatures it was possible to substantiate polymerisation processes which cannot be suppressed by chemical additives. The catalytics promotion of chemical reactions by elevated temperatures is known and has been confirmed in the investigations made. At low temperatures the triglycerides lose their Newtonian behaviour and they rather behave like a substance of structural viscosity. The use of especially developed additives is an effective measure for the improvement of the low-temperature properties. The effectiveness of these active substances has been proved experimentally.

The hydrolytical susceptibility of ester iols is known and poses a problem which cannot be eliminated by simple measures. Here it is moreover necessary to maintain the prerequisites for a biological degradability of the oils. However, shifting the chemical balance, e.g. by addition of glycerine, results in a delay of the scission reactions, without suppressing them. Further improvements will have to be realized by structural and/or process engineering measures. What is in the foreground in this respect is to prevent that the oil will be contaminated by water. A further measure is the separation of eventual water infiltration from the fluid system.