



Danfoss Drives A/S

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EU DECLARATION OF CONFORMITY

Danfoss Drives A/S
DK-6300 Graasten, Denmark

declares on our responsibility that our products:

VLT[®] series 1-4, 5-20, 100, 200, 2000, 2800, 3000, 3500, 5000, 6000, 8000, FCM, FCD

are absolutely free of PCB or PCB compounds in oil or components if the product is manufactured after 1972. We do not have reliable information about the material content of components and oil for product manufactured before 1971.

The oil filled products of the VLT[®] series 5-20 contains an oil (Univolt 72) that is absolutely free of harmful substances. The oil meets the requirements of British Standard BS148 and does not contain PCB or other toxic substances. The oil is free of sulphur, is non-corrosive and can be disposed off like any other mineral oil product.

Issued by:

Flemming Lynge Nielsen
Quality Systems Manager

UNIVOLT 72 Typical Test Data

Specific Gravity at 60/60°F	0.870
Viscosity, Kinematic at 20°C cS	26.3
Viscosity, Kinematic at 50°C cS	8.36
Viscosity Saybolt 100°F SSU	68
Viscosity Saybolt 210°F SSU	35.6
Viscosity-Gravity Constant	0.835
Flash Point P.M. Closed Cup °F	315
Flash Point P.M. Open Cup °F	320
Fire Point °F	350
Pour Point °F	-50
Colour ASTM D1500	0.5
Colour Lovibond 6" cell	5
Mineral Acidity mg KOH/g	nil
Neutralisation Value mg KOH/g	0.02
Aniline Point °C	83.4
Sulphur Content wt. %	0.27
Sulphur, Free, ASTM D989	nil
Sulphur, Corrosive, ASTM D1275	1
Interfacial Tension, 20°C dynes/cm	41
Refractive Index n_D^{20}	1.482
Dielectric Constant (Permittivity)	2.2
Electric Strength kV/4mm	70
(BS148 method) ¹	
<i>(determined on filtered de-gassed and dried oil).</i>	
Dielectric Loss $\tan \delta$, 100°C	0.0015
Resistivity at 20°C ohms cm	$1,200 \times 10^{12}$
	<i>(water content 10 ppm)</i>

¹ Univolt 72 meets all the requirements of BS148:1959

HYDROCARBON ANALYSIS:

ASTM D 2007	
Polar compounds	2
Saturates	74
Aromatics	24

CERL METHOD	%
Polar compounds	2.5
Saturates	74.5
Aromatics	23

STABILITY/AGING TESTS BS148:1959

Sludge value %	0.86
Acidity after oxidation mg KOH/g	1.54

IEC OXIDATION TEST AFTER TEST

Neutralisation number, mg KOH/g	0.10
Sludge, wt. %	0.020

ASE OXIDATION TEST

AFTER 72 h	ASTM Colour	5
	Neutralisation number, mg KOH/g	0.16
	Sludge, wt. %	0.04
	Cotton thread resistance loss, %	5
AFTER 168 h	ASTM colour	6.5
	Neutralisation number, mg KOH/g	0.25
	Sludge, wt. %	0.13
	Cotton thread resistance loss %	17
	Tan δ , 100°C	
	Before test	0.0020
	After test	0.1380

1 DENSITY AND VARIATION WITH TEMPERATURE

Density at 15°C = 0.870 g/ml.

Density falls as temperature rises and may be calculated at t_0 from the following –

$$d_t = \frac{d_0}{1 + \alpha t}$$

where d_t = density at ($t_0 + t$)

d_0 = density at temperature t_0

t = difference in temperature

α = 0.00075

2 SPECIFIC HEAT AND VARIATION WITH TEMPERATURE

Specific Heat at 20°C = 0.44 cal/g/°C

increasing with temperature rise.

It may be calculated from the following:–

$$C_p = \frac{1}{\sqrt{d}} (0.402 + 0.00081t)$$

where C_p = specific heat at constant pressure
in calories per gram per °C.

d = density at 15°C

t = temperature in °C

3 THERMAL CONDUCTIVITY AND VARIATION WITH TEMPERATURE

Thermal conductivity at

15°C = 0.00032 cal/cm/cm²/s/°C.

For most practical purposes it may be calculated for other temperatures from the following:–

$$K_t = \frac{0.28}{d} (1 - 0.00054t) 10^{-3}$$

where d = density at 15°C

t = temperature at which the thermal
conductivity is calculated.

K_t = thermal conductivity in
cal/cm/cm²/s/°C at temperature t °C