

Hydraulic fluid power - Fire-resistant fluids - Requirements and guidelines for use

Contents		Page
Foreword	v	
Introduction	vi	
1 Scope	1	
2 Normative references	1	
3 Terms and definitions	1	
4 Hydraulic systems -- Fire hazards	1	
4.1 General	1	
4.2 Fault conditions	1	
4.3 Sources of ignition	2	
5 Requirements for fire-resistant fluids	2	
5.1 General fluid requirements	2	
5.1.1 General	2	
5.1.2 Viscosity	2	
5.1.3 Lubrication	3	
5.1.4 Compatibility	3	
5.1.5 Chemical and thermal stability	3	
5.1.6 Air release and foaming	3	
5.1.7 Shear stability	3	
5.2 Other fluid properties which may impact upon system design	3	
5.2.1 General	3	
5.2.2 Filterability	3	
5.2.3 Density	3	
5.2.4 Vapour pressure	3	
6 Characteristics of fire-resistant hydraulic fluids and factors affecting their selection	4	
6.1 General	4	
6.1.1 Composition	4	
6.1.2 Classification of fire-resistance fluids	4	
6.1.3 Fluid mixing	4	
6.2 Characteristics of fluids in different categories	5	
6.2.1 HFAE -- Oil in water emulsions (thickened and un-thickened)	5	
6.2.2 HFAS -- Chemical solutions in water (thickened and un-thickened)	7	
6.2.3 HFB -- Water-in-oil emulsions (invert emulsions)	9	
6.2.4 HFC -- Water polymer solutions	11	
6.2.5 HFDR -- Synthetic fluids containing no water and consisting of phosphate esters	12	
6.2.6 HFDU -- Synthetic fluids containing no water and of other composition	14	
7 Hydraulic systems -- General precautions	15	
7.1 Assembly work	15	
7.2 Pipework and hoses	15	
7.3 Seals and gaskets	15	
7.4 High fluid temperatures	16	
8 Hydraulic circuit requirements for fire-resistant fluids	16	
8.1 Reservoir	16	
8.2 Pipework and hoses	16	

8.3	Pump suction	16
8.4	Strainers and filters	16
8.5	Equipment performance	17
9	Changing the fluid in a hydraulic system	17
9.1	General	17
9.2	Draining and cleaning the circuit	17
9.3	Flushing and draining the circuit	18
9.4	Filling and re-commissioning the circuit	19
9.5	Appropriate flushing fluids	19
10	Handling	22
10.1	Safety data sheets	22
10.2	Handling procedures	22
10.3	Storage	22
	Bibliography	24