

ISO 12333:2000-02 (E)

Aerospace - Constant-displacement hydraulic motors - General specifications for 35000 kPa systems

Contents		Page
Foreword		vi
1	Scope	1
2	Normative references	1
3	Classification	2
4	Functional requirements	2
4.1	Hydraulic fluid	2
4.2	Pressures	2
4.2.1	Rated supply pressure	2
4.2.2	Rated differential pressure	2
4.2.3	No-load break-out pressure	2
4.2.4	Rated case-drain port pressure	3
4.2.5	Case and return port proof pressure	3
4.2.6	Inlet port proof pressure	3
4.2.7	Inlet port burst pressure	3
4.3	Rated temperature	3
4.4	Rated displacement	4
4.5	Rated consumption	4
4.6	Leakage	4
4.6.1	Case drain flow	4
4.6.2	Shaft seal leakage	4
4.6.3	External leakage	4
4.7	Speed and direction of rotation	5
4.7.1	Direction of rotation	5
4.7.2	Rated speed	5
4.7.3	Overspeed	5
4.7.4	Maximum no-load speed	5
4.8	Torque	5
4.8.1	Rated torque	5
4.8.2	Break-out torque	5
4.8.3	Stalling torque	5
4.8.4	Torque pulsations	5
4.9	Efficiency	7
4.10	Dynamic characteristics	7
4.11	Dynamic braking	7
4.12	Rapid reversals	7
4.13	Passive operation	7
4.14	Noise level	7
4.15	Rated endurance	7
5	Installation	8
5.1	Dimensions	8
5.2	Mass	8
5.3	Mounting	8
5.4	Drive	8
5.5	Ports	8
6	Construction	9

6.1	Materials	9
6.2	Metals	9
6.2.1	General	9
6.2.2	Motors for type I systems	9
6.2.3	Motors for type II and type III systems	9
6.2.4	Ferrous, copper and aluminium alloys	9
6.3	Castings	10
6.4	Corrosion-preventive treatment	10
6.5	Seals	10
6.6	Lubrication	10
6.7	Balance	10
6.8	Parts with critical installation direction	10
6.9	Self-contained failure	11
6.10	Marking	11
6.10.1	Nameplate	11
6.10.2	Fluid identification	11
6.11	Seal of guarantee	11
7	Maintainability	11
7.1	Maintainability features	11
7.2	Maintenance concept	12
7.3	Service life limit and storage specifications	12
8	Reliability	12
8.1	Equipment compliance	12
8.2	Specifications	12
9	Quality assurance provisions	12
9.1	Responsibility for inspection	12
9.2	Classification of tests	13
10	Qualification tests	13
10.1	Purpose	13
10.2	Qualification procedures	13
10.2.1	Detail specification	13
10.2.2	Qualification by analogy	13
10.2.3	Motor qualification test report	13
10.3	Qualification testing	13
1.1.1	General conditions	13
10.3.2	Dimensional check	14
10.3.3	Environmental conditions	14
10.3.4	Test sequence	14
10.3.5	Static proof pressure tests	14
10.3.6	Static burst pressure test	15
10.3.7	Overspeed test	15
10.3.8	Operational test at overpressure	15
10.3.9	Calibration	16
10.3.9.1	General	16
10.3.9.2	Torque and flow rate	16
10.3.9.3	Dynamic braking	16
10.3.9.4	Rapid reversals	16
10.3.9.5	Passive operation	16
10.3.9.6	Break-out torque	16
10.3.9.7	Stalling torque and internal leakage	16
10.3.10	Low-temperature tests	17
10.3.11	Thermal shock test	17
10.3.12	Endurance testing	17
10.3.12.1	General	17
10.3.12.2	Test sample	17
10.3.12.3	Hydraulic fluid	17

10.3.12.4	Leakage permissible during endurance testing	18
10.3.12.4.1	Case tightness.....	18
10.3.12.4.2	Shaft seal.....	18
10.3.12.5	Start-stop tests	18
10.3.12.6	Filtration during endurance testing	20
10.3.12.7	Filter checks	20
10.3.12.8	Part failure	20
10.3.12.9	Recalibration	20
10.3.13	Endurance in operating reversibility (bi-directional motors only)	20
10.3.14	Vibration tests	20
10.3.14.1	Position of a motor under test	20
10.3.14.2	Motor operating during vibration tests	20
10.3.14.3	Resonant-frequency vibration	21
10.3.14.4	Cyclic vibration	21
10.3.14.5	Other tests	21
10.3.15	Drive shaft shear test (if applicable)	21
10.3.16	Supplementary tests	21
11	Acceptance	21
11.1	General	21
11.2	Identification	21
11.3	Teardown inspection	21
11.4	Acceptance testing	22
11.4.1	General conditions	22
11.4.2	Test sequence	22
11.4.3	Running-in	22
11.4.4	Overspeed test	22
11.4.5	Operational test at overpressure	22
11.4.5.1	Inlet port proof pressure test	22
11.4.6	Operational tests at rated conditions	22
11.4.7	Inspection after testing	23
11.5	Performance data	23
11.6	External leakage check	23
11.7	Filter patch test	23
11.7.1	Filter sampling method	23
11.7.2	Patch preparation	23
11.7.3	Reference patch determination	24
11.7.4	Patch comparison	24
12	Storage and packaging	24