

# ISO 9206:2016-03 (E)

## Aerospace series - Constant displacement hydraulic motors - General specifications

<b>Contents</b>		<b>Page</b>
Foreword .....		vi
<b>1</b>	<b>Scope .....</b>	<b>1</b>
<b>2</b>	<b>Normative references .....</b>	<b>1</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>2</b>
<b>4</b>	<b>Classification .....</b>	<b>6</b>
<b>5</b>	<b>General requirements .....</b>	<b>6</b>
5.1	Order of precedence .....	6
5.2	Hydraulic system characteristics .....	6
5.3	Airworthiness regulations .....	6
5.4	Qualification .....	6
<b>6</b>	<b>Functional requirements .....</b>	<b>7</b>
6.1	Hydraulic fluid .....	7
6.2	Pressures .....	7
6.2.1	Rated supply pressure .....	7
6.2.2	Rated differential pressure .....	7
6.2.3	No-load break-out pressure .....	7
6.2.4	Motor return port pressure .....	7
6.2.5	Case port pressure .....	7
6.3	Flows .....	8
6.3.1	Rated consumption .....	8
6.3.2	Case drain flow .....	8
6.3.3	Shaft seal leakage flow .....	8
6.3.4	External leakage .....	8
6.4	Speed and direction of rotation .....	9
6.4.1	Speed .....	9
6.5	Torque .....	9
6.5.1	Rated torque .....	9
6.5.2	Break-out torque .....	9
6.5.3	Stalling torque .....	9
6.5.4	Torque pulsations .....	9
6.6	Motor overall efficiency .....	11
6.7	Dynamic characteristics .....	12
6.7.1	General .....	12
6.7.2	Dynamic braking .....	12
6.7.3	Rapid reversals .....	12
6.8	Passive operation .....	12
6.9	Rated temperature .....	12
6.10	Acoustic noise level .....	12
6.11	Rated endurance .....	12
6.12	Environmental requirements .....	13
<b>7</b>	<b>Detail design requirements .....</b>	<b>13</b>
7.1	Dimensionally critical components .....	13
7.2	Maintainability features .....	13
7.3	Seals .....	14
7.4	Lubrication .....	14

7.5	Balance .....	14
7.6	Self-contained failure .....	14
7.7	Safety wire sealing .....	14
7.8	Electro-conductive bonding .....	14
7.9	Marking .....	14
7.9.1	Nameplate .....	14
7.9.2	Fluid identification .....	15
7.9.3	Ports .....	15
8	Strength requirements .....	15
8.1	General .....	15
8.2	Proof pressure .....	15
8.2.1	Motor case .....	15
8.2.2	Motor inlet port .....	15
8.2.3	Motor return port .....	15
8.3	Ultimate pressure .....	16
8.3.1	Motor case .....	16
8.3.2	Motor inlet port .....	16
8.3.3	Motor return port .....	16
8.4	Pressure impulse (fatigue) .....	16
8.5	Port strength .....	16
9	Construction requirements .....	16
9.1	Materials .....	16
9.1.1	General .....	16
9.1.2	Metals .....	17
9.2	Corrosion protection .....	17
9.2.1	General .....	17
9.2.2	Ferrous and copper alloys .....	17
9.2.3	Aluminium alloys .....	18
9.3	Castings .....	18
10	Installation requirements .....	18
10.1	Dimensions .....	18
10.2	Mass .....	18
10.3	Mounting .....	18
10.4	Orientation .....	19
10.5	Drive shaft .....	19
10.6	Ports .....	19
11	Maintenance requirements .....	19
11.1	Maintenance concept .....	19
11.2	Service life limitations and storage specifications .....	19
12	Reliability requirements .....	20
12.1	Equipment compliance .....	20
12.2	Requirements .....	20
13	Quality assurance provisions .....	20
13.1	Responsibility for inspection .....	20
13.2	Classification of tests .....	20
13.3	Test stand requirements .....	20
14	Acceptance tests .....	21
14.1	General .....	21
14.2	Examination of the product .....	21
14.3	Test programme .....	21
14.3.1	General .....	21
14.3.2	External leakage requirements .....	22
14.3.3	Break-in run .....	22
14.3.4	Proof pressure and overspeed tests .....	22

14.3.5	Operational tests at rated conditions .....	22
14.3.6	Break-out torque test .....	23
14.3.7	Teardown inspection examination .....	23
14.3.8	Run-in .....	23
14.3.9	Performance data .....	23
14.3.10	Fluid contamination test .....	24
14.3.11	Electro-conductive bonding .....	25
14.4	Storage and packaging .....	25
15	Qualification procedures .....	25
15.1	General .....	25
15.2	Qualification procedure .....	25
15.2.1	Qualification by analogy .....	25
15.2.2	Motor qualification test report .....	25
15.2.3	Samples and program of qualification tests .....	25
15.3	Qualification testing .....	26
15.3.1	Dimensional check .....	26
15.3.2	Expanded envelope acceptance tests .....	26
15.3.3	Overspeed test .....	27
15.3.4	Operational test at overpressure .....	27
15.3.5	Calibration .....	27
15.3.6	Endurance testing .....	28
15.3.7	Environmental tests .....	31
15.3.8	Structural tests .....	32
15.3.9	Supplementary tests .....	33
	Bibliography .....	34