

ISO 5879:2023-08 (E)

Space systems - Ground test for the separation between a launch vehicle and a spacecraft - Requirements for combined separation tests, horizontal separation tests and individual falling separation tests

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	1
4	Symbols and abbreviated terms	2
5	General requirements	3
5.1	Purposes of separation testing	3
5.1.1	General	3
5.1.2	Verification purposes	3
5.1.3	Diagnostic purposes	3
5.1.4	Tailoring guide	3
5.2	General separation test process	3
5.2.1	General	3
5.2.2	Test documentation preparation and pre-test simulation	4
5.2.3	Test implementation	4
5.2.4	Test results data collection	4
5.2.5	Test results evaluation	4
5.3	Test articles under separation test	5
5.3.1	Specification of separation test unit	5
5.3.2	Requirements for test articles	6
5.3.3	Technical safety requirements for test articles	6
5.4	Data requirements	7
5.4.1	Test data	7
5.4.2	Separation movement data	7
5.4.3	Separation shock response data	7
5.4.4	The dedicated data by test requirements	7
5.5	Test timing and sequence	7
5.6	Requirements for pre-test simulation	7
5.6.1	Purposes of pre-test simulation	7
5.6.2	Requirements for the simulation modelling	8
5.6.3	Requirements for the simulation solver	9
5.6.4	Requirements for the simulation results	9
5.6.5	Validation of the simulation results	9
5.7	Requirements for test environment	9
5.8	Exception handling	9
5.8.1	Test interruption	9
5.8.2	Interruption handling	9
5.9	Test results assessment	9
5.10	Test documentation	9
6	Test facilities	10
6.1	General	10

6.2	Calibration requirements	10
6.3	Control instrumentation requirements	10
6.3.1	Requirements for electrical power source	10
6.3.2	Requirements for hold-down/release mechanism controller and connection cables	10
6.4	Measurement instrumentation and equipment requirements	11
6.4.1	General	11
6.4.2	Requirements for accelerometer for translational motion measurement	11
6.4.3	Requirements for high-speed video camera	11
6.4.4	Requirements for rate gyroscope	12
6.4.5	Requirements for timing measurement system	12
6.4.6	Requirements for optical displacement measurement system	12
6.4.7	Requirements for shock measurement system	13
6.5	Testing fixture requirements	14
6.5.1	General	14
6.5.2	Requirements for the test scaffolding	14
6.5.3	Requirements for the angular rotation mechanism	15
6.5.4	Requirements for the release mechanism between test fixture and test articles	15
6.5.5	Test article capture system requirements	15
6.6	Technical safety requirements for test facilities	16
6.6.1	Consolidation and support of test scaffolding	16
6.6.2	Confirmation of safety status of test facilities	16
6.6.3	Test area	16
7	Test installation	16
7.1	General	16
7.2	Test articles installation requirements	16
7.2.1	Installation process	16
7.2.2	Functional constraints	16
7.3	Sensors installation requirements	16
7.3.1	Accelerometers for translational motion measurement installation requirements	16
7.3.2	Rate gyroscopes installation requirements	17
7.3.3	Shock accelerometers installation requirements	17
7.4	High-speed video camera installation requirements	17
7.4.1	Camera arrangement	17
7.4.2	Installation location	18
7.4.3	Purpose	18
7.4.4	Luminance	18
7.5	Technical safety requirements for test installation	18
7.5.1	Training and qualification	18
7.5.2	Working high above the ground	18
8	Requirements for the preliminary adjustment of the test setup	18
9	Measurement and data acquisition requirements	18
9.1	General	18
9.2	Acquisition and processing requirements for the dedicated data by test requirements	19
9.3	Acquisition and processing requirements for separation movement data	19
9.3.1	Noise reduction	19
9.3.2	Data format	19
9.4	Acquisition and processing requirements for shock response data	19
9.4.1	Shock response data	19
9.4.2	Detection of anomalies	19
9.4.3	Processing requirements	19
9.4.4	SRS values	19
9.4.5	Time data format	19
9.4.6	Shock response spectrum	20
Annex A (informative)	Overview and interdependencies of test methods	21
Annex B (informative)	Combined separation test	23

Annex C (informative) Individual falling separation test25
Annex D (informative) Horizontal separation test27
Annex E (informative) The implementation of separation test30
Bibliography32