

# E DIN EN 4709-001:2021-08 (E)

Erscheinungsdatum: 2021-07-02

Aerospace series - Unmanned Aircraft Systems - Part 001: Product requirements and verification; English version prEN 4709-001:2021

---

Inhalt	Seite
European foreword .....	6
1 Scope .....	7
2 Normative references .....	7
3 Terms and definitions.....	8
4 Product Requirements and Compliance for Class 0 UAS.....	14
4.1 MTOM.....	14
4.1.1 Performance requirements .....	14
4.1.2 Verification method.....	15
4.1.3 Pass Criteria.....	15
4.2 Maximum Speed.....	16
4.2.1 Performance requirements .....	16
4.2.2 Verification method.....	16
4.2.3 Pass criteria .....	18
4.3 Maximum attainable height.....	18
4.4 Safely controllable.....	19
4.4.1 General .....	19
4.4.2 Pass Criteria.....	19
4.5 Minimize injury to people .....	19
4.5.1 Performance and design requirements.....	19
4.5.2 Verification methods.....	21
4.5.3 Pass criteria .....	25
4.6 Power .....	25
4.6.1 Performance and design requirements.....	25
4.6.2 Pass criteria .....	25
4.7 Follow-me mode.....	25
4.7.1 Performance and design requirements.....	25
4.7.2 Verification methods.....	25
4.7.3 Pass criteria .....	29
4.8 Manufacturer's instructions .....	29
4.8.1 Requirements.....	29
4.8.2 Verification method.....	29
4.8.3 Pass criteria .....	33
4.9 Information Notice .....	33
4.9.1 Design requirements.....	33
4.9.2 Verification method - Requirement (1) - Information notice.....	34
4.9.3 Pass criteria .....	34
5 Product Requirements and Compliance for Class 1 UAS.....	34
5.1 Ground impact.....	34
5.1.1 80 Joules.....	34
5.1.2 MTOM.....	39
5.2 Maximum speed .....	39
5.3 Maximum attainable height.....	39
5.3.1 Performance requirements .....	39

5.3.2	Verification method .....	40
5.3.3	Pass criteria.....	44
5.4	Safely controllable .....	45
5.4.1	General.....	45
5.4.2	Pass Criteria .....	45
5.5	Mechanical strength.....	45
5.5.1	Performance and design requirements .....	45
5.5.2	Verification methods .....	47
5.5.3	Pass Criteria .....	56
5.6	Minimize injury to people .....	56
5.7	Loss of data link .....	56
5.8	Sound power .....	56
5.8.1	General.....	56
5.8.2	Performance and design requirements .....	57
5.8.3	Verification method .....	57
5.8.4	Pass Criteria .....	59
5.9	Power.....	59
5.10	Unique physical serial number .....	59
5.11	Direct Remote Identification .....	59
5.12	Geo-awareness .....	59
5.13	Airspaces limitation function .....	59
5.14	Battery low level.....	59
5.15	Lights .....	59
5.16	Follow-me mode .....	59
5.17	Manufacturer's instructions.....	59
5.17.1	Requirements.....	59
5.17.2	Verification method .....	60
5.17.3	Pass criteria.....	65
5.18	Information notice.....	66
5.18.1	Design requirements .....	66
5.18.2	Verification method - Requirement (1) - Information notice .....	66
5.18.3	Pass criteria.....	66
6	Product Requirements and Compliance for Class 2 UAS .....	66
6.1	MTOM .....	66
6.1.1	General.....	66
6.1.2	Pass Criteria .....	66
6.2	Maximum attainable height .....	66
6.3	Safely controllable .....	67
6.3.1	Performance and design requirements .....	67
6.3.2	Verification method .....	69
6.3.3	Pass criteria.....	75
6.4	Mechanical strength.....	76
6.5	Tethered UA .....	76
6.6	Minimize injury to people .....	76
6.6.1	General.....	76
6.6.2	Performance and design requirements .....	76
6.6.3	Verification method - Requirement (6) - Speed limit.....	76
6.6.4	Pass Criteria .....	77
6.7	Command and Control (C2) link .....	77
6.7.1	Loss of C2 link.....	77
6.7.2	C2 link protection.....	80
6.8	Low speed mode .....	81
6.8.1	Performance requirements.....	81
6.8.2	Verification method - Requirement (1) - Low speed mode.....	82
6.8.3	Pass criteria.....	82

6.9	Sound power.....	82
6.10	Power.....	82
6.11	Direct Remote Identification.....	82
6.12	Geoawareness.....	82
6.13	Airspace limitation function.....	82
6.14	Battery low level.....	82
6.14.1	Performance requirements.....	82
6.14.2	Test methods.....	83
6.14.3	Pass criteria.....	84
6.15	Lights.....	84
6.16	Manufacturer's instructions.....	84
6.16.1	Requirements.....	84
6.16.2	Verification method.....	85
6.16.3	Pass criteria.....	90
6.17	Information Notice.....	91
6.17.1	Design requirements.....	91
6.17.2	Verification method - Requirement (1) - Information notice.....	91
6.17.3	Pass criteria.....	91
7	Product Requirements and Compliance for Class 3 UAS.....	91
7.1	MTOM.....	91
7.1.1	General.....	91
7.1.2	Pass Criteria.....	91
7.2	Maximum characteristic dimension.....	91
7.2.1	Design requirements.....	91
7.2.2	Verification methods.....	92
7.2.3	Pass Criteria.....	94
7.3	Maximum attainable height.....	94
7.4	Safely controllable.....	94
7.4.1	General.....	94
7.4.2	Pass Criteria.....	94
7.5	Tethered UA.....	95
7.5.1	Performance and design requirements.....	95
7.5.2	Verification methods.....	97
7.5.3	Pass Criteria.....	101
7.6	Loss of data link - Performance requirements.....	102
7.7	Sound power.....	102
7.8	Power.....	102
7.9	Unique physical serial number.....	102
7.10	Direct Remote Identification.....	102
7.11	Geoawareness.....	102
7.12	Airspace limitation function.....	102
7.13	Data link protection.....	102
7.14	Battery low level.....	102
7.15	Lights.....	102
7.16	Manufacturer's instructions.....	102
7.16.1	Requirements.....	102
7.16.2	Verification method.....	103
7.16.3	Pass criteria.....	108
7.17	Information Notice.....	109
7.17.1	Design requirements.....	109
7.17.2	Verification method - Requirement (1) - Information notice.....	109
7.17.3	Pass criteria.....	109
8	Product Requirements and Compliance for Class 4 UAS.....	109
8.1	MTOM.....	109

8.1.1	General.....	109
8.1.2	Pass Criteria .....	109
8.2	Safely controllable .....	110
8.2.1	Design and performance requirements.....	110
8.2.2	Verification method .....	110
8.2.3	Pass criteria.....	116
8.3	Automatic control modes conditions.....	116
8.3.1	Performance requirements.....	116
8.3.2	Verification method .....	116
8.3.3	Pass criteria.....	117
8.3.4	Test methods .....	118
8.4	Manufacturer's instructions.....	120
8.4.1	Requirements.....	120
8.4.2	Verification method .....	120
8.4.3	Pass criteria.....	125
8.5	Information Notice .....	126
8.5.1	Design requirements .....	126
8.5.2	Verification method - Requirement (1) - Information notice .....	126
8.5.3	Pass criteria.....	126
<b>Annex A (informative) Recommendations for the design to reduce the probability and effects of laceration by propellers .....</b>		<b>127</b>
A.1	Mechanical Safeguards.....	127
A.2	Operational safeguards.....	127
A.2.1	Mechanical Shock Detection.....	127
A.2.2	Emergency Stop .....	127
<b>Annex B (informative) Verification method for distinguishing UA with different class marks .....</b>		<b>129</b>
<b>Annex ZA (informative) Relationship between this document and the essential requirements of Delegated regulation (EU) 2019/945 of 12th March 2019 on unmanned aircraft systems and on third-country operators of unmanned aircraft systems aimed to be covered .....</b>		<b>130</b>
<b>Bibliography.....</b>		<b>133</b>