



SLOVENSKI STANDARD

oSIST prEN 3197:2025

01-december-2025

Aeronavtika - Načrtovanje in vgradnja letalskih električnih in optičnih sistemov za medsebojno povezovanje

Aerospace series - Design and installation of aircraft electrical and optical interconnection systems

Luft- und Raumfahrt - Konstruktion und Installation elektrischer und optischer Verkabelung in Luftfahrzeugen

Série Aérospatiale - Conception et installation des organes de raccordements électriques et à fibres optiques sur avions

Ta slovenski standard je istoveten z: prEN 3197

[oSIST prEN 3197:2025](https://standards.iteh.ai/catalog/standards/sist/68da0a89-452f-4447-808d-da68de354cae/osist-pr-en-3197-2025)

<https://standards.iteh.ai/catalog/standards/sist/68da0a89-452f-4447-808d-da68de354cae/osist-pr-en-3197-2025>

ICS:

49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems
49.090	Oprema in instrumenti v zračnih in vesoljskih plovilih	On-board equipment and instruments

oSIST prEN 3197:2025

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

DRAFT
prEN 3197

September 2025

ICS 49.060; 49.090

Will supersede EN 3197:2010

English Version

**Aerospace series - Design and installation of aircraft
electrical and optical interconnection systems**

Série Aérospatiale - Conception et installation des
organes de raccordements électriques et à fibres
optiques sur avions

Luft- und Raumfahrt - Konstruktion und Installation
elektrischer und optischer Verkabelung in
Luftfahrzeugen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee ASD-STAN.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	8
1 Scope	9
2 Normative references	9
3 Terms and definitions	10
4 EWIS and OFIS Architecture Requirements.....	16
4.1 Applicable regulation	16
4.1.1 General.....	16
4.1.2 Large aeroplanes.....	16
4.1.3 Small and medium aeroplanes including unmanned air vehicles.....	17
4.1.4 Small rotorcraft	17
4.1.5 Large rotorcraft	17
4.1.6 Aircraft engines	17
4.2 Main design rules	17
4.2.1 Design priority	17
4.2.2 Service life.....	18
4.2.3 Maintenance considerations.....	18
4.2.4 Composite structure.....	18
4.3 Parts, materials and processes	19
4.3.1 Selection considerations	19
4.3.2 Components qualification	19
4.3.3 Processes qualification	20
4.3.4 Test methods	20
4.3.5 Environmental directives.....	20
4.4 Main hazards.....	20
4.4.1 Security for personnel — Human protection.....	20
4.4.2 Smoke and fire hazards.....	21
4.4.3 Arcing event types	21
4.4.4 Corona effect.....	28
4.4.5 Clearance and creepage.....	29
4.5 Fretting corrosion	29
4.5.1 Phenomenon description.....	29
4.5.2 Fretting corrosion mitigation	30
4.6 Failure Mode Effect and Analysis (FMEA).....	30
4.6.1 Context	30
4.6.2 Mitigation means.....	31
4.6.3 EWIS component failure modes.....	31
4.7 Systems architecture requirements toward EWIS and OFIS architecture	32
4.7.1 System Architectural pattern.....	32
4.7.2 Safety Requirements.....	33
4.7.3 Aircraft Operational Reliability Aspects.....	33
4.7.4 Aircraft or system specific requirements.....	34
4.7.5 Elementary functions.....	34
4.7.6 Failure conditions of functions	35
4.7.7 Specific EWIS and OFIS requirements	36
4.8 Grounding, bonding and shielding.....	37
4.8.1 Grounding/Electrical current return.....	37

4.8.2	Bonding	38
4.8.3	Shielding/Shield bonding	40
5	EWIS and OFIS architecture segregation	40
5.1	Purpose	40
5.2	Route categories	41
5.3	Electrical generation	42
5.4	Earthing Networks/Grounding strategy (IT/TN network)	42
5.5	Electrical distribution and communication	43
5.5.1	Purpose	43
5.5.2	Power supplies and data	43
5.5.3	Essential routes	44
5.5.4	Cabin related harnesses	44
5.5.5	Electrical Flight Control System (EFCS)	44
5.5.6	Fuel tank wiring	45
5.5.7	Signal and other low power sensitive circuit	45
5.5.8	Electro-explosive subsystems	45
5.6	Grounding, bonding and shielding	45
5.6.1	Grounding/Electrical current return	45
5.6.2	Bonding	46
5.6.3	Shielding	46
5.7	Specific Hazard — Particular risk architectural constraint	46
6	Components selection	47
6.1	Applicable regulation	47
6.2	General requirements	47
6.2.1	Commonality	47
6.2.2	Environment	47
6.2.3	Maintenance, repair or modification	48
6.2.4	Materials	48
6.2.5	Voltage and current ratings	49
6.3	Electrical and fibre optic cables	49
6.3.1	General requirements	49
6.3.2	Type of cable	50
6.3.3	Electrical cables design	50
6.3.4	Fireproof and fire-resistant cable (EN 2346, EN 4608)	51
6.3.5	Fibre optic cables	52
6.3.6	Special cable types	53
6.4	Connectors	54
6.4.1	Types of connectors	54
6.4.2	Construction	54
6.4.3	Mating and un-mating operation	56
6.4.4	Fibre optic termini	56
6.4.5	Cable outlet accessories	56
6.4.6	Contact and connection voltage and current capacity	56
6.5	Circuit protective devices	57
6.5.1	Type of protective devices	57
6.5.2	Electrical protection	57
6.5.3	Circuit Breaker	59
6.5.4	Arc Fault Circuit Interrupter	60
6.5.5	Arc fault circuit breaker (EN 4838)	60
6.5.6	Remote control circuit breaker	60
6.5.7	Solid state circuit breaker	60
6.5.8	Residual current device (RCD)	60

6.5.9	Fuse	60
6.6	Switching devices	61
6.6.1	Type of switching devices	61
6.6.2	Electrical switching	61
6.6.3	Relays, micro-contactors and contactors	62
6.7	Terminal junction systems	63
6.7.1	Type of terminal junction systems.....	63
6.7.2	Design	64
6.7.3	Other types of modules	64
6.8	Terminal contacts	64
6.8.1	Type of terminal contacts.....	64
6.8.2	Material and plating.....	65
6.8.3	Sizing.....	65
6.9	Terminal lugs.....	65
6.9.1	Type of terminal lugs	65
6.9.2	Design	65
6.9.3	Sizing.....	65
6.10	Splices.....	67
6.10.1	Type of splices	67
6.10.2	Design	67
6.10.3	In line splice	67
6.10.4	Gauge splice adaptation.....	67
6.10.5	Sealed splice.....	67
6.10.6	Screened cable splice.....	67
6.10.7	Quick disconnect splice.....	67
6.10.8	Closed end-splice.....	68
6.10.9	Splices for fibre optic cables	68
6.11	Solder sleeves.....	68
6.11.1	Type of solder sleeves	68
6.11.2	Design	68
6.12	Feedthrough (pressure Bung housing assemblies).....	69
6.12.1	Type of feedthrough.....	69
6.12.2	Design.....	69
6.13	Clamp.....	69
6.13.1	Type of clamp.....	69
6.13.2	Design of “V” clamps.....	70
6.13.3	Design of “P” clamps.....	70
6.13.4	Selection of “Ω” clips	70
6.14	Protective parts	70
6.15	Identification parts.....	70
6.16	Installation components.....	71
6.16.1	Type of cable ties selection.....	71
6.16.2	Plastic cable ties (EN 4056)	71
6.16.3	Metallic cable ties.....	71
6.16.4	Lacing tapes.....	71
6.16.5	Lacing sheath	72
6.16.6	Raceways and cable tray.....	72
6.17	Separator.....	72
6.18	Junction boxes	73
6.19	Type of junction boxes	73
7	Installation requirements.....	73
7.1	Purpose	73

7.2	Zone categories	74
7.2.1	Zoning description	74
7.2.2	Pressurized zones.....	75
7.2.3	Un-pressurized zones.....	75
7.2.4	Fluid ingress zones.....	75
7.2.5	SWAMP zones.....	75
7.2.6	Undercarriage bays.....	76
7.2.7	Vibration zones	76
7.2.8	Fuel tank and fuel vapour zones	76
7.2.9	Hydraulic zones.....	76
7.2.10	Hot zones	76
7.2.11	EMI/EMH sensitives zones	76
7.2.12	Fire zones	77
7.2.13	Weapons systems and defensive aids systems	77
7.3	Installation of wires, cables and bundles.....	77
7.3.1	Separation Principle.....	77
7.3.2	Mechanical separation: general principle	78
7.3.3	Separation from sharp edge	79
7.3.4	Electrical separation: general principle.....	80
7.3.5	Separation by physical distances versus separation by barrier	80
7.3.6	Harness geometry and morphology	85
7.3.7	Conduit, sleeve and over-braiding	96
7.3.8	Attachment to aircraft structure.....	99
7.3.9	Supports.....	101
7.3.10	Cable tie.....	105
7.3.11	Tape.....	105
7.3.12	Spare provision	106
7.4	Installation of connection element and feedthrough	107
7.4.1	Protection of connection.....	107
7.4.2	Torquing and locking of standard electrical and fibre optic items.....	108
7.4.3	Connectors and accessories.....	108
7.4.4	Terminals	113
7.4.5	Splices	115
7.4.6	Splice installation	115
7.4.7	Thermocouple connexion.....	116
7.4.8	Feedthrough and pressure seal.....	116
7.5	Equipment installation.....	117
7.5.1	Positioning of electrical equipment in the aircraft considering environmental constraints	117
7.5.2	Installation of non-coded equipment.....	118
7.5.3	Panels and Boxes	118
7.6	Grounding (current return), bonding and shielding requirements.....	119
7.6.1	Bonding and grounding.....	119
7.6.2	Shielding	119
7.6.3	HIRF	119
7.6.4	Compass deviation	119
7.6.5	Ignition	120
7.7	Component manufacturing	120
7.7.1	Cable	120
7.7.2	Fibre optic terminations (Termini)	120
7.7.3	Shrinkable sleeve	121
7.7.4	Inspection — User control tests for terminals and splices (electrical)	122
7.7.5	Solder sleeve termination installation	123