SLOVENSKI STANDARD
SIST EN 3475-603:2018

01-april-2018

Nadomešča:
SIST EN 3475-603:2011
SIST EN 3475-603:2011/AC:2012

Aeronavtika - Električni kabli za uporabo v letalih - Preskusne metode - 603. del: Ugotavljanje odpornosti proti obloku v vlažnih razmerah

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 603: Resistance to wet arc tracking

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 603: Lichtbogenfestigkeit, feucht

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 603: Résistance à l'amorçage et à la propagation d'arc électrique, essai humide

Ta slovenski standard je istoveten z: **EN 3475-603:2018**

ICS:

29.060.20	Kabli	Cables
49.060	Letalska in vesoljska električna oprema in sistemi	Aerospace electric equipment and systems

SIST EN 3475-603:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 3475-603

January 2018

ICS 49.060

Supersedes EN 3475-603:2011

English Version

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 603: Resistance to wet arc tracking

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 603: Résistance à l'amorçage et à la propagation d'arc électrique, essai humide

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 603: Lichtbogenfestigkeit, feucht

This European Standard was approved by CEN on 28 August 2017.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

European foreword

This document (EN 3475-603:2018) has been prepared by the Aerospace and Defence Industries Association of Europe - Standardization (ASD-STAN).

After enquiries and votes carried out in accordance with the rules of this Association, this Standard has received the approval of the National Associations and the Official Services of the member countries of ASD, prior to its presentation to CEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by July 2018 and conflicting national standards shall be withdrawn at the latest by July 2018.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 3475-603:2011.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies a method of assessing the behaviour of cable insulation subject to an electric arc initiated and maintained by contaminating fluid along the surface of the insulation.

This European Standard shall be used together with EN 3475-100.

The primary aim of this test is:

— to produce, in a controlled fashion, continuous failure effects, which are representative of those, which may occur in service when a typical cable bundle is damaged and subjected to aqueous fluid contamination. Electrical arcing occurs along the surface of the insulation between damage sites on adjacent cables;

— to examine the aptitude of the insulation to track, to propagate electric arc to the electrical origin.

Originally defined for 115 Vac network, this test also proposes conditions for 230 Vac network. Unless otherwise specified in product standard, only 115 Vac conditions shall be satisfied.

Six (6) levels of prospective fault current have been specified for concerned cable sizes (see Clause 7). It is agreed that sizes larger than 051 need not be assessed since the short-circuit phenomenon becomes dominant at low line impedances.

Unless otherwise specified in the technical/product standard sizes 002, 006 and 020 cable shall be assessed.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 2350, *Aerospace series — Circuit breakers — Technical specification*

EN 3197, *Aerospace series — Design and installation of aircraft electrical and optical interconnection systems*

EN 3475-100, *Aerospace series — Cables, electrical, aircraft use — Test methods — Part 100: General*

EN 3475-302, *Aerospace series — Cable, electrical, aircraft use — Test methods — Part 302: Voltage proof test*

A-A-52083, *Tape, lacing and tying, glass* [1)]

3 Specimen requirements

Cables to be tested shall be of traceable origin and shall have passed the high voltage dielectric test defined in the product standard.

1) Published by: Department of Defense Industrial Supply Center, ATTN: DISC-BBEE, 700 Robbins Avenue, Philadelphia, PA 19111-5096 – USA.

4 Preparation of specimen

Cut seven (7) separate lengths approximately 0,5 m consecutively from one (1) length of cable, and strip each of the ends of insulation to permit electrical connection. Clean each length of cable with a clean cloth moistened with propan-2-ol (isopropyl alcohol) fluid.

Damage two (2) lengths of the cable by inflicting a cut around the total circumference at the mid-point of the length, taking care to ensure that the cut penetrates to the conductor around the full circumference and has a width of 0,5 mm to 1,0 mm.

Lay up the seven (7) cables as follows:

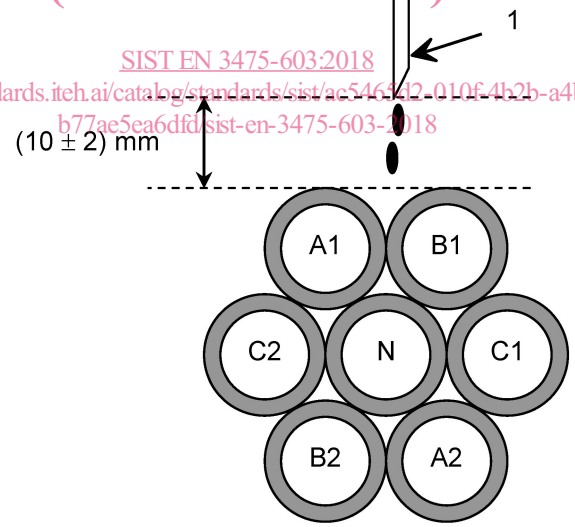
a) Form the cables in a six (6) around one (1) configuration as shown in Figure 1.

b) Displace the damaged cables longitudinally such that a separation of (10 ± 0,5) mm of undamaged insulation is provided as shown in Figure 2. This is called the test zone.

c) Ensure that cables are straight and geometrically parallel, and restrained by lacing tapes such that they are in continuous contact within the test zone.

d) Position the lacing tapes (4 ± 1,0) mm away from outer each notch and then at 15 mm to 20 mm spacing towards the ends of the specimen as show in Figure 2. The tie material used adjacent to the notch shall be PTFE glass lacing tape conforming to A-A-52083 type IV, finish D, size 3.

e) Number the cables as shown in Figure 1 such that the fault cables are numbers A1 and B1 and the centre is N. Cables C1, A2, B2 and C2 are grouped around N.



Key

1 Drop needle

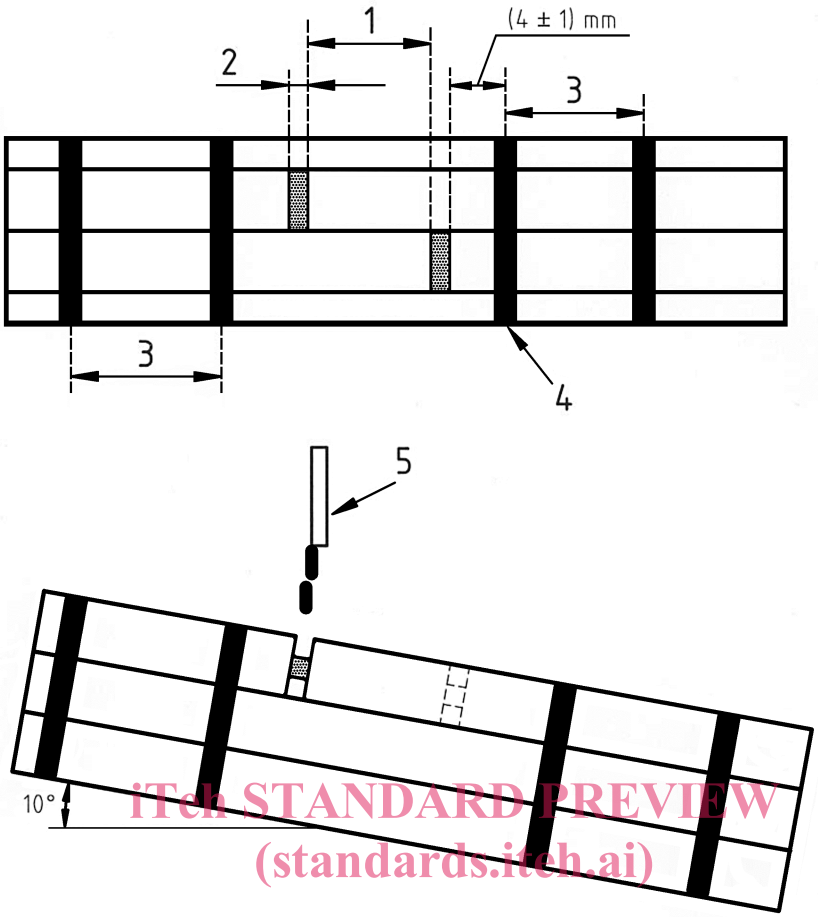
A1-A2 : Phase A

B1-B2 : Phase B

C1-C2 : Phase C

N : Neutral cable connected to earth

Figure 1 — Specimen configuration



Key

1 Test zone (10 ± 0,5) mm
2 Notch 0,5 mm to 1 mm
3 15 mm to 20 mm
4 Lacing tape
5 Drop needle

Figure 2 — Test configuration

5 Apparatus

5.1 Electrical equipment

Connect the seven (7) cables of the test specimen within the circuit shown in Figure 3. This circuit shall have the following requirements:

a) The provision of adjustable levels of prospective fault currents for the six (6) A, B and C cables and an electrical return path for the N cable.

b) A three (3) phase 115/200 V 400 Hz (115 Vac network) or 230/400 V 400 Hz (230 Vac network) star (Y) connected supply shall be derived from a dedicated rotary machine capable of sustaining the maximum prospective fault current given in Table 1 (115 Vac network) or Table 2 (230 Vac network) for at least sufficient time for the circuit protection to operate. In any case the generator shall have a sufficient rating to provide these prospective fault currents.

c) The (115 Ω - 115 W per phase for 115 Vac network or 230 Ω - 230 W per phase for 230 Vac network) ballast resistors R1, are fitted in order to prevent over voltage during the arc extinction phases (opening of an inductive circuit).

d) 115 Vac or 230 Vac circuit breakers (D2) shall be single pole units rated at the values specified in Table 3.

They shall have trip characteristics in accordance with EN 2350 or as required by the product.

NOTE 1 Reference of circuit breakers used shall be recorded.

NOTE 2 In particular case, others ratings of thermal breaker protection could be employed in accordance with aircraft manufacturer rules.

e) The electrical power source shall be appropriately protected and should be established that no combination of test circuit events would activate this protection.

f) The resistors shall be non-inductive and have appropriate power rating. Care shall be taken to position all laboratory wiring such that inductive effects are reduced to a practical minimum. Supply cables shall be as short as possible.

g) Cables A, B and C shall be connected to indication and open circuit detectors (Rg) at the entry into the grounded star point. These components shall limit the standing current to no more than 10 % of the circuit breaker rating.

h) An automatic shutdown facility shall be provided, which shall, upon the detection of any open circuit during the test and after a 10 s delay, shut down the flow of electrolyte and electrical power. An open circuit in this case means either a physical break in the specimen or a thermal breaker trip. The facility to override this shutdown facility shall be provided so as to restore the power whilst still inhibiting the flow of electrolyte.

The physical break in the specimen is to be indicated by lamps in series with resistor Rg.

i) Appropriate instrumentation, recording and switching control shall be installed in accordance with good laboratory practice.

j) Adjust resistor Rg so that the current (I) in the circuit is 10 % of value of the circuit breaker rated current.