SLOVENSKI STANDARD
SIST EN 3475-605:2010

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Aeronavtika - Električni kabli za uporabo v zračnih plovilih - Preskusne metode - 605. del: Mokri preskus kratkega stika

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 605: Wet short circuit test

Luft- und Raumfahrt - Elektrische Leitungen für Luftfahrtverwendung - Prüfverfahren - Teil 605: Verhalten nach Kurzschluß, feucht

Série aérospatiale - Câbles électriques à usage aéronautique - Méthodes d'essais - Partie 605 : Essai de court-circuit humide

Ta slovenski standard je istoveten z: **EN 3475-605:2010**

ICS:

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

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EUROPEAN STANDARD

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English Version

Aerospace series - Cables, electrical, aircraft use - Test methods - Part 605: Wet short circuit test

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This European Standard was approved by CEN on 27 February 2010.

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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 Management Centre has the same status as the official versions.

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

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Foreword

This document (EN 3475-605:2010) 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of an identical text or by endorsement, at the latest by January 2011, and conflicting national standards shall be withdrawn at the latest by January 2011.

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

This document supersedes EN 3475-605:2002.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This standard specifies a method for appraising the behaviour of cable insulation subjected to an electric arc initiated and maintained by a contaminating fluid.

This 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 such that electrical arcing occurs, between cables; and

— 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 levels of prospective fault current have been specified for concerned cable sizes (see Clause 7). It is generally agreed that larger sizes 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 referenced documents are indispensable for the application of this document. 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 — Installation of aircraft electrical and optical interconnection systems* [1)]

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

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

A-A-52083, *Tape, lacing and tying, glass* [2)]

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.

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1) Published as ASD Prestandard at the date of publication of this standard.

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

4 Preparation of specimen

4.1 Cut seven separate lengths of approximately 0,5 m consecutively from one length of cable, and strip one 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.

4.2 Lay up the seven cables as follows:

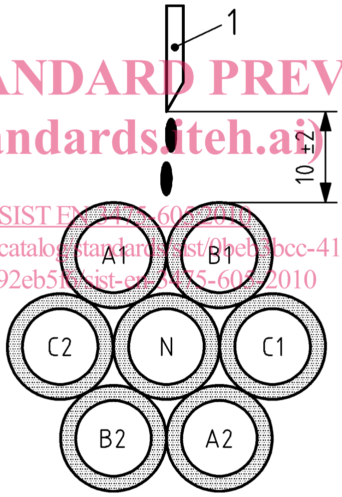
a) Form the cables in a six around one configuration as shown in Figure 1.

b) Ensure that all cables are straight and geometrically parallel, and restrained by ties such that they are in continuous contact at least within the test zone.

c) Position the ties at 50 mm spacing toward the end of the specimen as shown in Figure 2. The first tie shall be at no more than 5 mm behind the dripping point. The tie material shall be PTFE glass lacing tape conforming to A-A-52083, type IV, finish D, size 3.

d) Position the ties at 50 mm spacing toward the end of the specimen as shown in Figure 2. The first tie shall be at no more than 5 mm behind the dripping point. The tie material shall be PTFE glass lacing tape conforming to A-A-52083, type IV, finish D, size 3.

Dimensions in millimetres



Key

1 Drop needle

A1-A2: Phase A

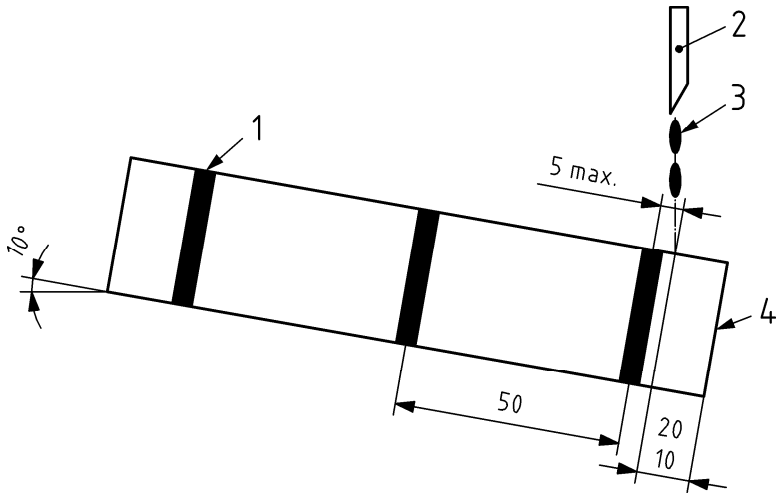
B1-B2: Phase B

C1-C2: Phase C

N: Neutral cable connected to earth

Figure 1 — Specimen configuration

Dimensions in millimetres



Key

1 Cable tie
2 Drop needle
3 Drops
4 Ends of the seven cables in the same plane

Figure 2 — Test configuration

5 Apparatus

5.1 Electrical equipment

Connect the seven cables of the test sample within a circuit as shown in Figure 3. This circuit shall have the following requirements:

a) The provision of adjustable levels of prospective fault currents for the six A, B and C cables.

b) A three 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 for at least sufficient time for circuit protection to operate. In any case the generator shall have a sufficient rating to provide these prospective fault currents.

c) 115 Vac or 230 Vac circuit breakers shall be single pole units rated at the values specified in Table 2. They shall have trip characteristics in accordance with EN 2350 or as required in the product specification.

NOTE 1 Reference of circuit breakers used should be recorded.

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

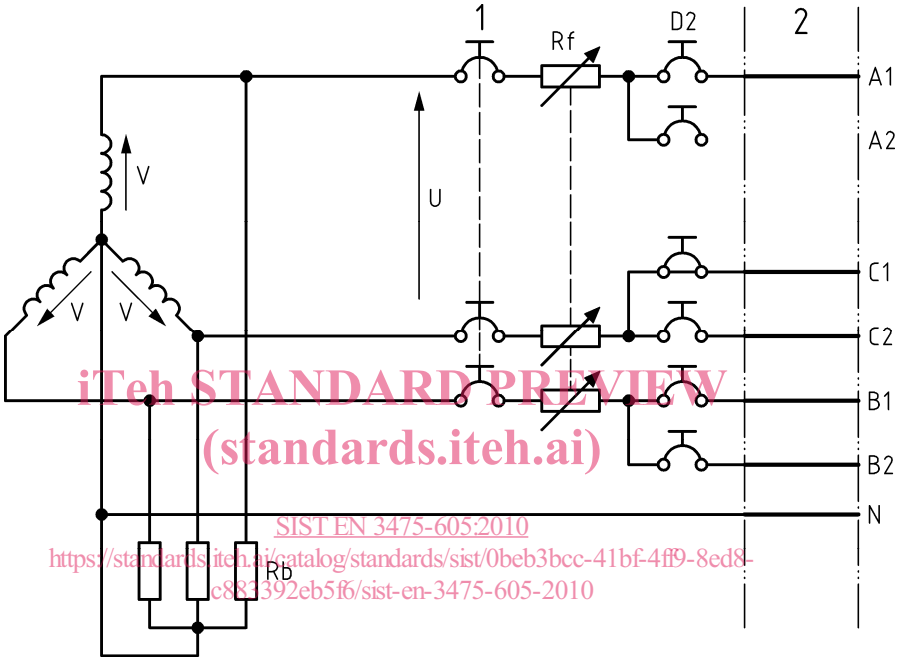
d) The electrical power source shall be appropriately protected and it shall be established that no combination of test circuit events would activate this protection.

e) The ballast Rb resistors shall be non-inductive and of 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.

The ballast resistor Rb is in order to prevent over voltage (115 Ω − 115 W per phase for 115 Vac network or 230 Ω − 230 W per phase for 230 Vac network) during the arc extinction phases (opening of an inductive circuit).

f) A rheostat, Rf, limiting maximum short-circuit current per phase by simulating a line length.

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



Key

Rf Rheostat
Rb Ballast resistor
1 Supply protection
2 Test bundle

Figure 3 — Test schematic circuit

5.2 Test equipment

Construct an apparatus as shown diagrammatically in Figure 2, which includes the following minimum provisions:

a) Electrical terminations to provide a ready means of connecting test specimens into the circuit as shown in Figure 3.

b) A transparent enclosure to protect personnel from ejected molten metal and short wavelength ultra violet light.

c) An electrolyte delivery system which provides a constant rate of (100 ± 10) mg/min and dispenses drops from an 18 gauge needle, cut of square at the outlet.