

SLOVENSKI STANDARD SIST EN 3909:2016

01-september-2016

Nadomešča: SIST EN 3909:2008

Aeronavtika - Preskusne tekočine za električne in optične sestavne dele in njihove podsestave

Aerospace series - Test fluids for electrical and optical components and sub-assemblies

Luft- und Raumfahrt - Prüfflüssigkeiten für elektrische und optische Bauteile und Untergruppen

(standards.iteh.ai)

Série aérospatiale - Fluides d'essais pour composants et sous-ensembles électriques et optiques <u>SIST EN 3909:2016</u> https://standards.iteh.ai/catalog/standards/sist/9c418bb9-329c-42f5-a5da-

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Ta slovenski standard je istoveten z: EN 3909:2016

<u>ICS:</u>

49.060 Letalska in vesoljska električna oprema in sistemi

Aerospace electric equipment and systems

SIST EN 3909:2016

en,fr,de



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SIST EN 3909:2016

EUROPEAN STANDARD NORME EUROPÉENNE **EUROPÄISCHE NORM**

EN 3909

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ICS 49.060

Supersedes EN 3909:2007

English Version

Aerospace series - Test fluids and test methods for electrical and optical components and sub-assemblies

Série aérospatiale - Fluides d'essais et méthodes d'essai pour composants et sous-ensembles électriques et optiques

Luft- und Raumfahrt - Prüfflüssigkeiten und Prüfverfahren für elektrische und optische Bauelemente und Untergruppen

This European Standard was approved by CEN on 27 September 2015.

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. (standards.iteh.ai)

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

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EN 3909:2016 (E)

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European Foreword

This document (EN 3909:2016) 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 November 2016, and conflicting national standards shall be withdrawn at the latest by November 2016.

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 3909:2007.

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 Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom itch.ai/catalog/standards/sist/9c418bb9-329c-42f5-a5da-

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1 Scope

This standard specifies the list of test fluids to be used to demonstrate that components and subassemblies will not be adversely affected by contamination by fluids types that they may typically be exposed to.

The fluids listed are representative of those commonly used and encountered in airborne and ground operations, and align with the requirements of fluids susceptibility of ISO 7137. This shall not be considered an exhaustive list and additional test fluids may be instructed in the product standard, against which compliance needs to be demonstrated. This standard, when used in conjunction with the test requirements defined in Clause 6 or the product standard shall be considered the starting point to test a component to determine its minimum performance capability when exposed to the fluids listed.

Test results obtained from a number of sources over a considerable period of time have shown that, in many cases, widely varying results can be obtained when using fluids that are used in service. The practice of specifying fluids based on performance criteria rather than their constituents can mean variations in test results between batches of the fluid obtained from different manufacturers, or even from the same manufacturer.

For this reason the EN 3909 Standard recommends the use of "standard test fluids" which are specified by their constituents and contain the chemicals that may be found in commonly used fluids.

Where equipment may be exposed to fluid types that are not covered by Table 1 or where specific test fluids are considered to be necessary, the product standard shall identify the particular fluid required. If a manufacturer chooses to include additional test fluids (e.g. to satisfy a customer requirement), they do so at their own risk.

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2 Normative references

(standards.iteh.ai)

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.

ed642449dfac/sist-en-3909-2016 EN 2349-405, Aerospace series — Requirements and test procedures for relays and contactors — Part 405: Fluid resistance

EN 2591-315, Aerospace series — Elements of electrical and optical connection — Test methods — Part 315: Fluid resistance

EN 3475-411, Aerospace series — Cables, electrical, aircraft use — Test methods — Part 411: Resistance to fluids

EN 3745-411, Aerospace series — Fibres and cables, optical, aircraft use — Test methods — Part 411: Resistance to fluids

EN 3841-405, Aerospace series — Circuit breakers — Test methods — Part 405: Fluid resistance

EN 4057-303, Aerospace series — Cable ties for harnesses — Test methods — Part 303: Resistance to fluids

ISO 1817, Rubber, vulcanized or thermoplastic — Determination of the effect of liquids

ISO 7137, Aircraft — Environmental conditions and test procedures for airborne equipment

ISO 11075, Aircraft — De-icing/anti-icing fluids — ISO type I

ISO 11078, Aircraft — De-icing/anti-icing fluids — ISO types II, III and IV

MIL-PRF-87937, Cleaning Compound, Aerospace Equipment¹)

AMS 1428G, Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian, (Pseudoplastic), SAE Types II, III, and IV²)

AMS 1476B, Deodorant, Aircraft Toilet²)

¹⁾ Published by: DoD National (US) Mil. Department of Defense (http://www.defenselink.mil/).

²⁾ Published by: SAE National (US) Society of Automotive Engineers (http://www.sae.org/).

ASTM D740, Standard Specification for Methyl Ethyl Ketone²)

3 Test fluids

Unless specified in the relevant product standard, test specification or test method, all test fluids listed in Table 1, of this standard, are mandatory.

To ensure the optimum performance of all the test fluids, the shelf life and storage conditions must be maintained in accordance with the fluid manufacturer's recommendations.

4 Test samples

The test sample shall be either, a component or an assembly, as specified in the test method and/or product standard. The size and/or physical arrangement of each test sample or test assembly shall enable complete sample immersion into the test fluid in accordance with the test procedure.

5 Test procedures

Unless otherwise stated in the product standard, the following component types shall be tested in accordance with either; EN 2349-405 for relays and contactors, EN 2591-315 for electrical connectors and accessories, EN 3475-411 for cables, EN 3745-411 for fibre optic components, EN 3841-405 for circuit breakers or EN 4057-303 for cable ties, to confirm they are not susceptible to the fluids listed in Table 1.

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For any other types of components requiring testing using the fluids listed in Table 1, the appropriate test procedures shall be as defined in the relevant product standard.

NOTE Unless otherwise specified in the product standard, the test specification shall control the complete test procedure including instructions such as cleaning the test samples and the choice of cleaning fluids (this should not result in further contamination) 2449 dfac/sist-en-3909-2016

6 Test temperatures

Test temperatures and flash point temperatures are as detailed in Table 1.

The test temperatures comprise a soak temperature in the test fluid; a conditioning period and a heat soak stage in air. The samples shall be inspected at ambient after the 3 stage cycle(s) as required by the product standard or technical specification.

The test temperatures listed in Table 1 comprise the recommended immersion fluid temperature followed by the recommended oven circulated air temperature. E.G. A sample to be tested in test fluid 'Gasoline' to ISO 1817 Liquid B (test fluid ref 1a), shall be immersed for 15 min to 20 min at 40 °C in the gasoline and removed. Stored for 7 h to 7,5 h at 23 °C. Placed in the oven for 16 h to 16,5 h at the relevant third phase temperature (refer to the product standard technical specification or test specification for the oven temperature).

7 Health and safety

It is the responsibility of the user to ensure all local and industrial health and safety requirements are followed during and after the test program. i.e. storage, use and disposal of test fluids.

The relevant Material Safety Data Sheet shall be consulted to establish safe handling of each fluid listed and tested. If there is any doubt the fluid supplier/manufacturer shall be consulted.

If the test temperature results in the fluid becoming a gas, the test authority shall determine the applicability of the test and the test facility shall ensure all health and safety measures are adhered to.

8 Information to be supplied in the product standard

The following information shall be supplied in the product standard:

- 1 Test procedures/method(s) to be used;
- 2 The quantity and sizes (including styles, etc.) of test samples;
- 3 Any departures from the test fluids and/or test protocol listed in this standard and the test procedure;
- 4 The test sample configuration (if not described by the relevant test procedure);
- 5 The pass/fail criteria for the characteristics under assessment.

Table 1 makes reference to a test fluid number. This reference may appear in the relevant test instruction as a numeric or a numeric and alpha. The new test reference numbers have been adopted to allow the selection of new fluids in accordance with changing environmental and business needs.

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The old test fluid references//shall-nothbe-ausedstforarteststfluidscall-up-infinewa-specifications. It is recommended that, wherever practical the test fluid shall be referred to by its full name or specification.

9 List of test fluids

For test fluids refer Table 1.

The relevant Material Safety Data Sheet (and the fluid supplier/manufacturer if necessary) shall be consulted to establish the characteristics and any special handling requirements associated with each fluid listed and tested. This includes establishing if a fluid is conductive or not. The fluid manufacturer shall be consulted if there are any doubts about a fluid or its characteristics.

Test fluid No.		Fluid family	Туре	Test fluid to be used	Fluid in service (for reference)		Test temperatur	Flash point
New	Old			(Consider Note 1)			e ± 2 °C	°C
1a	1	Fuels	Gasoline Toluene 30 % Isooctane 70 % v/v	ISO 1817 Liquid B	AVGAS- 100LL	NATO-F-18	40	4
1b	2	(Hydro Carbon)	Kerosene	ISO 1817 Liquid F	AVTUR/F SI	NATO-F-34 (JP-8)	70	40
					AVTUR	NATO-F-35		
					AVTAG/F SII	NATO-F-40 (JP-4)		
					AVCAT/F SII	NATO-F-44 (JP5)		
1c	n/a	Biofuel	As specified in the product standard.	As specified in the product standard.	_	-	See Note 2.	See Note 3.
2a	3	Hydraulic Fluids	Phosphate based	ISO 1817 Liquid 103	Synthetic Fluid H580	Skydrol 500B4 Skydrol 5	70	160
2b	4		Silicone Based	NATO-S-1714	NATO-S- 1714, ZX- 42	VIEW ⁻	80	140
2c	5		Mineral Based a	NATO-H-52011 OM-18	NATO-H- 6515,1 0M-15	NATO-H-520	80	80
3a	6	Oils ht	ps:// Minerat\Based ai/ca ed64	SIST EN 3909:20 talog/standards/sist 2449dfac/sist-en-39	1́мато-о- 9с4176,9- 09МД-90	329c-42f5-a5d a -	125	200
3b	7			NATO-0-142	NATO-O- 142, OM- 12	-	70	120
3c	8		Synthetic Oil Diester	ISO 1817 Liquid 101	NATO-O- 147, OX- 14	-	150	260
					NATO-O- 149, OX- 38	-	See Note 2.	See Note 3.
3d	9		Synthetic Oil	NATO-0-160, OX-26	NATO-O- 156, OX- 27	-	See Note 2.	See Note 3.
			Polyol ester		NATO-O- 148, OX-9	-	See Note 2.	See Note 3.
					NATO-O- 160, OX- 26	-	See Note 2.	See Note 3.
4a	10	Cleaning Fluids	Solvent	Isopropanol. See Note 4	NATO-S- 737, AL- 11	_	50	12
4b	n/a		See Note 1.	Ethanol. See Note 4.	NATO-S- 738	-	See Note 2.	See Note 3.

Table 1 — List of test fluids