



SLOVENSKI STANDARD
kSIST FprEN 16602-70-09:2014
01-julij-2014

Zagotavljanje varnih proizvodov v vesoljski tehniki - Merjenje termooptičnih lastnosti materialov za termalno kontrolo

Space product assurance - Measurements of thermo-optical properties of thermal control materials

Raumfahrtproduktsicherung - Messung der thermo-optischen Eigenschaften von Materialien zur Thermalkontrolle

Assurance produit des projets spatiaux - Mesures des propriétés thermo-optiques des matériaux de contrôle thermique

Ta slovenski standard je istoveten z: FprEN 16602-70-09

ICS:

49.140 Vesoljski sistemi in operacije Space systems and operations

kSIST FprEN 16602-70-09:2014 en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

FINAL DRAFT
FprEN 16602-70-09

April 2014

ICS 49.140

English version

Space product assurance - Measurements of thermo-optical properties of thermal control materials

Assurance produit des projets spatiaux - Mesures des propriétés thermo-optiques des matériaux de contrôle thermique

Raumfahrtproduktsicherung - Messung der thermo-optischen Eigenschaften von Materialien zur Thermalkontrolle

This draft European Standard is submitted to CEN members for unique acceptance procedure. It has been drawn up by the Technical Committee CEN/CLC/TC 5.

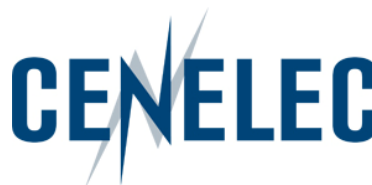
If this draft becomes a European Standard, CEN and CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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

CEN and CENELEC members are the national standards bodies and national electrotechnical committees 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey 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.



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

Table of contents

Foreword	5
Introduction	6
1 Scope	7
2 Normative references	8
3 Terms, definitions and abbreviated terms	9
3.1 Terms defined in other standards	9
3.2 Terms specific to the present standard	9
3.3 Abbreviated terms.....	9
4 Requirements	10
4.1 Preparatory conditions	10
4.1.1 Hazards, health and safety precautions	10
4.1.2 Preparation of samples	10
4.1.3 Facilities	11
4.2 Selection of test methods.....	11
4.3 Quality assurance.....	12
4.3.1 Data	12
4.3.2 Calibration.....	12
4.4 Audit of measurement equipment	12
4.4.1 General	12
4.4.2 Audit of the system (acceptance)	13
4.4.3 Annual regular review (maintenance) of the system.....	13
4.4.4 Special review.....	13
Annex A (normative) Evaluation report of the measurement of thermo-optical properties of thermal control materials– DRD	14
A.1 DRD identification	14
A.1.1 Requirement identification and source document.....	14
A.1.2 Purpose and objective.....	14
A.2 Expected response	14
A.2.1 Scope and content	14

A.2.2	Special remarks	14
Annex B (normative) Audit / review report for the measurement equipment of thermo-optical properties of thermal control materials - DRD..... 15		
B.1	DRD identification	15
B.1.1	Requirement identification and source document.....	15
B.1.2	Purpose and objective.....	15
B.2	Expected response	15
B.2.1	Scope and contents	15
B.2.2	Special remarks	15
Annex C (informative) Test methods 16		
C.1	Format.....	16
C.2	Solar absorptance using spectrometer (α_s).....	16
C.2.1	General	16
C.2.2	Configuration of samples.....	16
C.2.3	Test apparatus and setting up	17
C.2.4	Test process and measurement.....	17
C.2.5	Calculation of absorptance.....	17
C.3	Comparative test method (α_p).....	18
C.3.1	General	18
C.3.2	Configuration of samples.....	18
C.3.3	Test apparatus and setting up	19
C.3.4	Test process and measurement.....	19
C.3.5	Calculations	19
C.4	Infrared emittance using thermal test method (ε_h).....	20
C.4.1	General	20
C.4.2	Configuration of samples.....	20
C.4.3	Test apparatus and setting up	20
C.4.4	Test process and measurement.....	20
C.4.5	Calculations of total hemispherical emittance.....	22
C.5	Infrared emittance using IR spectrometer (ε_h).....	23
C.5.1	General	23
C.5.2	Configuration of samples.....	23
C.5.3	Test apparatus and setting up	23
C.5.4	Test process and measurement.....	23
C.5.5	Calculation of emittance.....	24
C.6	Infrared emittance using portable equipment (ε_n).....	24
C.6.1	General	24

FprEN 16602-70-09:2014 (E)

C.6.2	Configuration of samples.....	24
C.6.3	Test apparatus and setting up.....	25
C.6.4	Test process and measurement.....	25
C.6.5	Calculation of the normal emittance	25
Bibliography.....		26
Figures		
Figure C- 1: Standard sample substrate		21

Foreword

This document (FprEN 16602-70-09:2014) has been prepared by Technical Committee CEN/CLC/TC 5 "Space", the secretariat of which is held by DIN (Germany).

This document (FprEN 16602-70-09:2014) originates from ECSS-Q-ST-70-09C.

This document is currently submitted to the Unique Acceptance Procedure.

This document has been developed to cover specifically space systems and will therefore have precedence over any EN covering the same scope but with a wider domain of applicability (e.g. : aerospace).

Introduction

The thermo-optical properties of materials are of importance to enable the calculation of the thermal housekeeping and radiative heat transfer.

This Standard describes the methodology, instruments, equipment and samples, used to calculate the thermo-optical properties of thermal-control materials, i.e. solar absorptance [α_s or α_p] and the infrared emittance [ε_i or ε_n].

In general this procedure has been written in connection with instruments and equipment available at ONERA, INTESPACE and ESTEC; however, any supplier is encouraged to built up his own instrument or equipment provided the accuracy of the results is equivalent to the one specified herein.

In this Standard, the supplier is identified as the entity that performs the test.