

Preparatory conditions

4.1.1 Hazards, health and safety precautions

- a. For “Safety and security” ECSS-Q-ST-20-07C shall apply.

NOTE For example, for hazard and health (safety) and for access control (security).

4.1.2 Preparation of samples

4.1.2.1 Configuration

- a. The supplier shall prepare the material samples according to the process specification or manufacturer’s data.
- b. The material shall be representative of batch variance.

NOTE For example: the application procedure for paint can result in different thermo-optical properties, depending on the painter and the type of spray gun used. This is the reason why the samples are coated or made at the same time as the workpiece.

4.1.2.2 Cleaning

- a. Cleaning method and other treatment of the sample shall be the same (and not more) as for the flight hardware.

NOTE In particular, solar absorptance properties are very sensitive to contamination and if the sample or the flight hardware is contaminated (even by hand grease), the test results are completely erroneous.

4.1.2.3 Handling and storage

- a. The supplier shall handle the samples with clean nylon or lint-free gloves.
- b. The supplier shall store the samples in a cleanliness-controlled area, with a room temperature of $(20 \pm 3) ^\circ\text{C}$ and relative humidity of $(55 \pm 10) \%$.
- c. The supplier shall shield coated surfaces from contact by using polyethylene or polypropylene bags or sheets.
- d. The supplier shall avoid mechanical damage of the sample by packing the polyethylene or polypropylene-wrapped workpieces in clean, dust- and lint-free material.
- e. The supplier shall label limited-life materials with their relative shelf lives and dates of manufacture.

4.1.2.4 Identification

- a. The supplier shall use a completed “Material identification card” in conformance with DRD in ECSS-Q-ST-70-02 for samples submitted for testing.
- b. The supplier shall verify the existence of a safety data sheet for hazardous samples

NOTE The safety data sheet is a set of information provided by the supplier of the chemical substance.

4.1.3 Facilities

4.1.3.1 Cleanliness

- a. The supplier shall keep the work area clean and free of dust.
 - b. The supplier shall use filters for the air used for ventilation.
- NOTE This is to prevent contamination of the sample.

4.1.3.2 Environmental conditions

- a. The ambient conditions for the process and work areas shall be $(22 \pm 3) ^\circ\text{C}$ with a relative humidity of $(55 \pm 10) \%$ unless otherwise stated.

4.1.3.3 Equipment

- a. The supplier shall define the equipment in the test procedure.

4.2 Selection of test methods

- a. The supplier shall select one or more of the following test methods depending on the type and size of the samples:
 - 1. Solar absorptance using spectrometer (α_s),

NOTE For details and conditions for the samples see Annex C.2.
 - 2. Comparative test method (α_p),

NOTE For details and conditions for the samples see Annex C.3.
 - 3. Infrared emittance using thermal test methods (ϵ_h),

NOTE For details and conditions for the samples see Annex C.4.
 - 4. Infrared emittance using IR spectrometer (ϵ_h),

NOTE For details and conditions for the samples see Annex C.5.
 - 5. Infrared emittance using portable equipment (ϵ_n).

NOTE For details and conditions for the samples see Annex C.6.

4.3 Quality assurance

4.3.1 Data

- a. The supplier shall retain the quality records for ten years or in accordance with project contract requirements.

NOTE Example of quality records are log sheets.
- b. An evaluation report shall be produced in conformance with Annex A and is a quality record

4.3.2 Calibration

- a. The supplier shall calibrate any measuring equipment to traceable reference standards.
- b. The supplier shall record any suspected or actual equipment failure as a project nonconformance report in conformance with NCR DRD in ECSS-Q-ST-10-09.

NOTE This is to ensure that previous results can be examined to ascertain whether or not reinspection and retesting is necessary.

4.4 Audit of measurement equipment

4.4.1 General

- a. The customer shall perform the standard audit according to ECSS-Q-ST-10.

NOTE 1 The main purpose of a standard audit is to ensure the validity of test results by comparison of the test data on identical materials by different test houses.

NOTE 2 The thermo-optical property data from test houses for the projects of the customer, obtained in the manner laid down in this Standard, are only accepted for the projects of the customer if the test house is certified to perform the relevant procedure in this Standard.

4.4.2 Audit of the system (acceptance)

- a. The customer's product assurance department shall audit the system after it has been built or purchased.

NOTE The audit is necessary before the system can be accepted for running qualification or quality control tests on materials for use in customer projects.

- b. The customer shall establish an audit report in conformance with Annex B.

- c. The customer shall issue the certificate of conformance after a successful audit or renew it every three years after a successful audit.

4.4.3 Annual regular review (maintenance) of the system

- a. The supplier shall establish an annual regular review report in conformance with Annex B.

- b. For each nonconformance the supplier shall perform the following actions:

1. determine the reasons for the nonconformance, and
2. perform a further test in accordance with clause 4.4.2.

NOTE These actions are necessary before a certificate of conformance is renewed.

- c. The supplier shall deliver the review report to all customers within six weeks after the end of the regular review or evaluation testing.

4.4.4 Special review

- a. The supplier shall report all modifications of the apparatus or associated equipment.
- b. The customer shall audit the modifications, if deemed necessary, before utilization of the modified system for the customer's project.
- c. For major modifications the supplier shall retest the apparatus as described in clause 4.4.2.