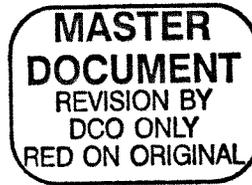




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Process Specification for the Handling of CsI Crystals

SAI-PROC-1231

October 6, 2003

Revision A

Prepared by:

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5050 Powder Mill Md.

Beltsville, MD

SIGNATURE PAGE

This is a controlled document. Any changes require the approval of the Configuration Control Board.

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-	Initial Release	9/9/03	B. Martini
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1. Scope

This specification establishes the requirements for the Handling of CsI (Cesium Iodide) Crystals.

2. Applicable Documents

The following documents form a part of this specification to the extent specified herein. If no revision is indicated, the latest issue in effect is applicable.

Government Documents

STANDARDS

MIL-STD-45662 Equipment Calibration

Non-Government Documents

SWALES AEROSPACE DRAWINGS

C0539 Carrier

3. Requirements

3.1. Receiving and Initial Storage

3.1.1 The delivery person's initial point of contact shall be Swales central receiving personnel located at 5021 Herzel Place. The crystals shall be supplied to Swales from NRL, with the following forms: DD FORM 1149, GLAST Work Order Authorization, CSP Notification Form (SAI-Form-0046) and Swales Certification Log (SAI-Form-0013).

3.1.2 The crystals are to remain in the shipping vehicle, within their shipping crate until they are unloaded at 11313 (STS) Frederick Avenue. The receiving documentation shall be delivered to 5021 Herzel Place. The receiving documentation shall be processed and forwarded to 11320 Frederick Avenue (SSS), Inspection Area, for Quality Assurance Inspection. The Swales receiving personnel shall have the delivery person escorted to 11313 (STS) Frederick Avenue.

3.1.3 Upon receipt at 11313 (STS) Frederick Avenue, the crystals shall remain in their crate and moved to the clean room vestibule. To allow for temperature stability, the crate(s) shall not be opened for at least 24 hours after being stored in the clean room vestibule.

3.1.4 After the 24-hour stabilization, open the crate in the clean room vestibule. The crystals are received wrapped in Tyvek and aluminum foil, supported by an aluminum angle and vacuum bagged. Remove the crystals, do not un-bag them, and place them on a flat plate on a cart just inside the clean room. Roll the cart to the storage shelves.

3.1.5 The storage shelves shall consist of wire shelves, a ¼" thick flat aluminum plate and a foam sheet wrapped with Llumalloy film. There shall be a maximum of 4 crystals stored in each bag and 4 bags of crystals per shelf (maximum of 16 crystals per shelf). There shall be a maximum of 4 shelves of crystals per rack (maximum of 64 crystals per rack).

3.1.6 The crystals shall be stored in a 12" x 16" ESD/vapor barrier bag with desiccant and humidity indicator. The bags shall remain flat on the shelves at all times. The crystals are brought to the bag and slid into the bag. The bag is never to be used to carry the crystal.

3.2. Facilities

3.2.1 Operations herein shall be performed in a class 100,000 or better clean room with temperature control between 68°F to 86°F (20°C to 30°C) and humidity control between 30% RH and 50% RH. Continuous temperature and humidity monitoring records for the bond work areas shall be maintained and shall be made available for review.

3.2.2 Clothing requirements for the clean room shall be hairnet, ESD smock and shoe covers. Personnel handling hardware, and/or involved in the bonding operation must wear powder-free nitrile gloves and a beard mask.

3.3. Personnel

3.3.1 All personnel working to this document shall be trained and certified to this document.

3.4. Handling

3.4.1 Crystal handling

- a) All crystals shall be traceable from receiving, processing, inspection, shipping, and delivery. When personnel action impacts traceability and identification, methods must be implemented to ensure traceability. Because the crystal itself does not contain a uniquely identifying mark, the shipping wrapper conveys the serial number.
- b) Each crystal shall be stored and handled with the “top” face up. Reference Figure 1 for orientation information.

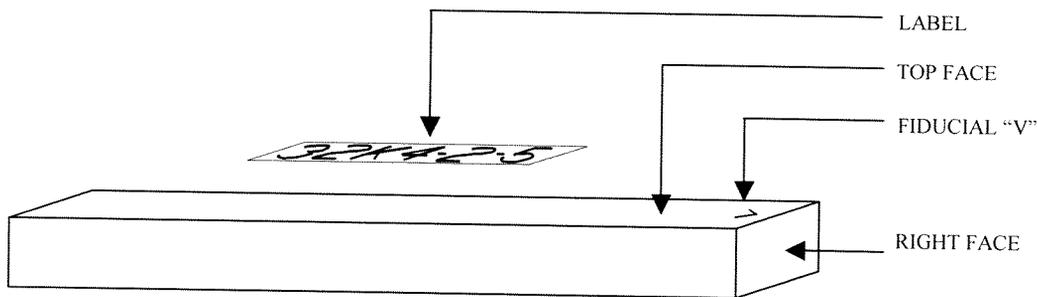


Figure 1: Crystal Labeling and Orientation Detail

- c) Carrier (C0539) shall support individual Crystals during handling and transport.
- d) CsI crystals are malleable and ductile. The four long edges of the crystals have a chamfer that is critical for assembly. Forces exerted by hand can damage the chamfer. It is essential that the crystals be handled in such a way as to prevent damage or deterioration during all phases of operation.
- e) Crystals can be distorted by mechanical shocks. Any shock should be reported to QA. No dimensional measurements shall be performed within seven days of the shock.

- f) Only powder-free nitrile gloves shall be used while contacting or handling crystals. Crystals shall never be handled using bare hands.
- g) The crystal temperature shall never be below the dew point of the environment surrounding the crystals.
- h) If the relative humidity of the work area exceeds 55%, all crystals exposed to the high humidity condition shall be bagged and purged with a constant flow of ultra-pure nitrogen gas until the relative humidity in the work area returns below 50%. If the crystals are being stored, bagged with desiccant and a humidity indicator, they are to remain bagged and the humidity indicator shall be checked prior to their use.
- i) If the relative humidity of the work area is in the range 50% to 55% for more than 3 hours, all crystals shall be bagged and purged with a constant flow of ultra-pure nitrogen gas until the relative humidity in the work area returns below 50%. Work may proceed while crystals are bagged, to the extent that it is physically feasible.
- j) The crystals shall not be subject to temperature gradients greater than 10°C per hour.
- k) The crystals shall never be exposed to direct sunlight. Except during inspection, the exposure to bright lights should be kept at a minimum.
- l) Any measurements of the optical properties of the crystals shall be performed not sooner than two hours after exposure to bright light.
- m) Sharp objects shall not be used while handling or performing operations on the crystals, except as required and identified in approved procedures.
- n) All tools shall be wiped clean with 100% ethanol prior to contact with the crystals.
- o) All materials shall be handled in such a manner as to minimize exposure to humidity, skin oils, and contamination.
- p) All work surfaces shall be kept free of noticeable dust and debris. Worktables shall be cleansed with 100% ethanol before use and covered with protective film or paper, as appropriate.
- q) Each crystal is received in a sealed and evacuated plastic bag. The bag shall be cut opened at one end with a pair of scissors and carefully slid off the crystal without lifting the crystal more than three inches from the work place (to minimize the risk of dropping a crystal and the likelihood of scratching the crystal surface).
- r) To prevent temperature shock, the crystal wooden shipping crates shall be stored in a temperature and humidity controlled environment for at least 24 hours without being opened.
- s) When it is separated from the crystal, the protective Tyvek and aluminum foil wrapping shall be stored in a clean, environmentally controlled container for potential re-use.

4. Quality Assurance Provisions

4.1. Material Control

4.1.1 All materials used shall have been received, inspected and issued a Lot Control Number (LCN) prior to use.

4.2. Receiving Inspection

4.2.1 Receiving and inspection of the crystals shall be as performed as described in the requirements section of this document.

4.2.2 If materials are received without the necessary documentation, the material shall be forwarded to the 11313 Frederick Avenue clean room vestibule. After placing the material in the clean room vestibule, QA shall be notified to place a "red hold tag" on the material. QA will obtain the necessary documentation prior to the release of the material.

4.3. Personnel Certification

Trained and competent technicians as determined shall perform processing in accordance with this specification.

4.4. Facility Approval Inspection

Facility approval inspection is performed with procedures normally used in production. Facility approval inspection consists of all the requirements in this specification. .

4.5. Surveillance

The cognizant Quality Assurance activity shall provide the surveillance necessary to verify conformance to this specification and processes.

4.6. Equipment Calibration

The cognizant Quality Assurance activity shall assure that the calibration system is in accordance with MIL-STD-45662.