

COS/HST FUV Grating Shipping Container Handling Procedure

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1. PURPOSE

This document provides a description of the COS/HST FUV shipping container and detailed instructions for removing and installing a grating.

2. APPLICABLE DOCUMENTS & DRAWINGS

COS-GSE-0001	COS Grating Shipping Container Box
COS-GSE-0002	Grating Base
COS-GSE-0003	Grating Top
COS-GSE-0004	Witness Coupon Base
COS-GSE-0005	Witness Coupon Top
COS-GSE-0006	Cover
COS-GSE-0007	Bezel
CASA-COS-1000	COS Grating Substrate G130M, G160M
CASA-COS-1001	COS Grating Substrate G140L

3. DESCRIPTION OF THE COS/HST FUV SHIPPING CONTAINER

The FUV grating shipping container consists of a five sided aluminum box with o-ring seals and purge hardware. Mounted to the bottom of the box are two teflon bases into which the flight optic and witness coupons rest. Kel-F covers mount over the optics in the teflon bases and restrain the optics. Non-locking 8-32 socket head cap screws hold the covers in place. A lexan cover forms the sixth side of the box and is held in place by an aluminum bezel with 16 captured 8-32 socket head button screws. Once sealed the shipping container can be purged with dry nitrogen to provide an inert environment for transporting the optics. The purge hardware consists of an input valve with a 5 micron particle filter and a 1/3 psi output check valve.

The entire shipping container fits into a black Pelican 1450 Case (17" X 12" X 7") for transporting the grating. The case was chosen to easily meet current airline restrictions on the size of carry-on luggage.

4. OPENING THE SHIPPING CONTAINER

Upon opening the Pelican carrying case the double bagged grating shipping container will be visible. The grating shipping container shall only be removed from the bagging material if it is being moved into a cleanroom facility. Removal shall proceed as follows:

1. Lift the double bagged shipping container out of the carrying case and immediately move it into the anteroom of the clean facility.
2. Remove the outer bag from the shipping container and immediately transfer the shipping container into the cleanroom facility.
3. Remove the inner bag only after the shipping container is in the cleanroom.
4. To remove the lid, place the container on a stable, flat surface.
5. Open the input valve to equalize the pressure inside the container.
6. Remove the 16 screws holding the lexan cover in place.
7. Lift off the bezel with the captured screws.
8. Vacuum off the lid, bezel, and screws to remove any particles.
9. Lift off the lexan cover. In the event that the lexan cover is stuck, a screw driver may be inserted at two points around the lid to help break the seal.
10. Vacuum around the helicoils and o-ring.
11. To remove the flight grating remove the 8 8-32 stainless steel socket head cap screws holding the two halves of the restrainer cover. The Kel-F halves can then be lifted out.
12. After the Kel-F restraining cover has been removed the grating can be lifted out of the teflon base.
13. To remove the witness samples, remove the 4 8-32 stainless steel socket head cap screws holding the Kel-F restrainer cover in place. Remove the restraining cover.
14. Remove the witness samples.

5. SEALING THE SHIPPING CONTAINER

To prepare the flight grating and associated witness samples for transport refer to the following steps:

1. With the shipping container empty verify that the bolts holding the teflon bases to the floor of the shipping container are tight. As these bolts are captured by the restraining covers there is no need to use a torque wrench to tighten the bolts.
2. Install the witness coupons into the teflon base.
3. Install the Kel-F restraining cover over the witness coupons. Each hole in the restraining cover has a beveled edge on one side. **THIS BEVELED EDGE GOES TOWARDS THE WITNESS SAMPLE.** The restraining cover will not seat correctly if the bevel is not oriented towards the coupons.
4. Install the 4 8-32 stainless steel socket head cap screws into the restraining cover and hand tighten the bolts.
5. Using a torque wrench tighten each bolt to 8 in-lbs.
6. Install the flight grating into the teflon base.
7. Install the Kel-F restraining covers around the flight grating.

8. Install the 8 8-32 stainless steel socket head cap screws and hand tighten.
9. Using a torque wrench, tighten each bolt to 8 in-lbs.
10. Install the lexan cover.
11. Install the bezel with the captured fasteners and snug up each fastener.
12. Following a cross pattern, tighten each captured fastener progressively until the lexan cover is firmly pressed onto the mounting surface.
13. Using a torque wrench and following a cross pattern tighten each bolt to 18 in-lbs. Verify that the cover is seated and the o-ring is compressed.
14. Attach a clean hose to the input valve on the shipping container.
15. Open the valve.
16. Using gaseous nitrogen (99.999% pure) purge the shipping container for a minimum of 1 hour (longer is preferable). During the purge process you should be able to hear a slight hiss from the exit valve indicating that there is sufficient flow through the shipping container.
17. After the purging is complete, close the input valve tightly.
18. Double bag the shipping container.
19. Remove the bagged shipping container from the cleanroom and install it into the carry case.

6. GENERAL INFORMATION

The fasteners used in the shipping container are all stainless steel. They all insert into phosphur bronze helicoils, so no lubrication is necessary. Be aware that particulation is a natural occurrence of threaded fasteners and inserts. If particulation occurs, vacuum or wipe off the particles from any non-optical surface with a cleanroom wipe. The shipping containers are vacuum baked and should not require any cleaning other than periodic removal of particles.