

APPENDIX 4-A

STORAGE OF TITANIUM SPONGE

1. *Description.* Titanium sponge is the metal product from reducing titanium tetrachloride with magnesium in the Kroll process. It is called sponge because of its sponge-like appearance. Sodium reduced metal also is referred to as sponge. Titanium sponge is highly susceptible to contamination and deterioration since its sponge-like characteristics permit pickup of free moisture if improperly packed and stored. When acquired, Titanium Sponge shall meet Purchase Specification P-97-R7 (Current Edition).

2. *Packaging*

a. New receipts of titanium sponge will be packed in new 55-gallon, 18-gauge steel drums conforming to the requirements of Federal Specification for drums, latest revision. The drums will be flushed free of air with argon gas, filled with sponge and sealed airtight.

b. Drums of titanium sponge must be kept tightly sealed at all times to prevent contamination. In case damaged containers are received or containers become damaged in storage the DNSC-OL should be notified immediately.

3. *Marking*

a. Prior to receipt, drums will be marked with name of product, grade and type, government contract number, gross and net weights, shipping lot number, drum serial number within shipping lot, BHN number, and the inscription, "Keep Air Tight."

b. The drums for new receipts shall have attached adhesively three 3" x 5" aluminum tags. Tags will be glued to each flat side of the cover and one to the side of the drum midway between the locking ring and the upper rolling hoop.

c. Identification of material shall be obtained from information shown on documents accompanying each shipment and on shipping instructions issued by the DNSC-OL. The DNSC-OL shall be notified immediately if shipments are received prior to receipt of identifying documents, if shipments are received without identifying marks, or if the markings are not in agreement with those shown on the documents and/or shipping instructions.

4. *Storage*

a. Titanium sponge in conventional painted steel drums will generally be stored in dry, sprinkler-equipped warehouses. Unsprinklered sheds, igloos, or other buildings may be used provided there is no co-storage with combustible materials.

b. When material is stored in a warehouse, shed, igloo, etc., the first tier of drums shall be placed on floor pallets in an upright position. Pallets between tiers shall contain a uniform number of drums. Stacking heights should be limited to approximately ten feet. If stored inside, pallets should be metal.

APPENDIX 4-A

STORAGE OF TITANIUM SPONGE

- c. When specifically directed by the DNSC-OL, galvanized C-1 (latest revision) drums may be stored in the open on concrete runners or blocks on improved space. When this type of storage is authorized, a static ground wire shall be affixed to one drum of a contiguous block stack.
- d. When material in galvanized drums is designated for storage in the open, drums shall be stored on their side and stacked in cordwood fashion on concrete runners or concrete blocks. The joint of the locking ring that holds the head on the drum should always be at the bottom. Storage aids used to keep drums stable shall be of concrete. Maximum stacking height from drums stored in the open will be four drums unless otherwise directed by the DNSC-OL.
- e. Whether stored in a warehouse, shed, igloo, or in the open, the drums shall be block stacked and stored in uniform rows and tiers. This method of storage will facilitate the taking of an inventory at any time by counting the rows and tiers and computing the total quantity. In doing this, however, economical use of space must be given full consideration and all segregation and other requirements must be met. When pallets are used, a uniform number of drums shall be placed on each pallet, except when an odd number on the top pallet of a stack of uniform height completes a lot.
- f. Storage identity will be maintained by government contract number, lot number, and drum serial number within the lot.
- g. Titanium sponge now in storage will not be restored to meet the above requirements except upon specific authority of the DNSC-OL.

5. Precautions To Be Taken

- a. Health. If loose metal must be handled dust should be minimized and respirators and gloves worn.
- b. *General.* Rough handling may cause extensive damage to the galvanized coating or painted surface on the drums. All abrasions and/or scratches shall be coated prior to placement of the drums in permanent storage. Proper care shall be exercised in handling drums in order to avoid damage. Upon receipt, drums should be carefully checked to insure that the lids are securely fastened.
- c. Titanium sponge is highly flammable when exposed to sparks or flame. An accumulation of titanium dust is highly explosive. Therefore, it is very important that any spills of titanium sponge be recovered in a prudent manner to prevent the hazard of fire.
- d. No more than 100 tons of titanium sponge shall be stored in a single fire section, unless the section being used contains only noncombustible materials, in which case, a maximum of 3,300 tons may be stored in one section. In no case may more than 3,300 tons be stored in one building.

APPENDIX 4-A

STORAGE OF TITANIUM SPONGE

6. *Average Storage Factor*

a. The average gross square feet per short ton for storage of titanium in covered space is approximately 12.3 square feet, and in open space approximately 9.5 square feet.

Titanium Shipment Procedures

1. You need to visually inspect and document that the drums are okay for shipment. This should be a separate report to be kept on file to be accomplished by operations personnel. This report does not go with the truck and can be obtained from DNSC-OL or the forms section of this manual. For drums that do not pass visual inspection and are impaired such that they may be likely to release material during transport set these drums in a separate area and ensure these drums are not given to purchaser.
2. The shipment must be transported as a bulk shipment in compliance with 49 CFR 173.240(a) or (b) as a sift-proof, closed vehicle or sift-proof closed car. Sift-proof, closed vehicle or car will act as the package. The drums will meet the sift-proof requirement for the vehicle. All paper work that accompanies the truck or car must indicate the gross weight of the material being shipped with no reference to the number of drums. Immediately after shipment a weight certificate will be faxed to the purchaser indicating net, gross, and drum count. **This Wt Cert. will not go with the truck or railcar.**
3. The requirement that the drums being properly labeled prior to shipment is no longer necessary. Since the shipment is being transported as a bulk shipment, drum labels are not needed.
4. Flat beds cannot be used for shipments, must be closed van or box car.
5. The purchaser will be the shipper of record. Though the DOT regulations also identify us as an “offeror” of this material (since we have made the DOT classification determination and performed the packaging function), we still require the purchaser or his representative to sign the shipping papers as well as placard the conveyance, except for rail cars shipments we will do the placarding.
6. Conveyance (trailer/rail car) must be for exclusive use for the material being shipped. This should be annotated on the bills of lading and conveyed to the dispatcher when arranging for shipments.
7. The appropriate DOT information associated with this shipments is as follows:

For a bulk shipment per 49 CFR 173.240(b)

Proper Shipping Name: Titanium sponge granules

APPENDIX 4-A

STORAGE OF TITANIUM SPONGE

Hazard Class:	Flammable Solid, 4.1
I.D. Number:	UN2878
Markings/Placarding:	The closed transport vehicle must be marked using the identification numbers "2878" in an orange rectangular panel per 172.332(b) and placarded with the Flammable Solid placard per 172.504, <u>or</u> the UN numbers of "2878" should be on the Flammable Solid placard per 172.332(d).
Labeling:	None
Packaging:	Per 173.240(a) or (b), in a sift-proof, closed Vehicle or rail car
Reportable Quantity (RQ):	No
Marine Pollutant (MP):	No
Shipping Paper Description:	Titanium sponge granules, 4.1, UN2878, PG III, 1 truck load or car load, XXX lbs. (Total gross weight of titanium sponge and drums being shipped); MSDS and/or Emergency Response Guide 170 should be attached to the shipping paper

Emergency Response Phone number.

- As of this date no overseas shipments are permitted. The packaging of this material does not meet overseas requirements. You can ship this material to a stateside port, but no reference to the material being shipped overseas can be on the paperwork sent with the driver.

FOR ADDITIONAL INFORMATION ON THIS COMMODITY REFER TO THE MATERIAL SAFETY DATA SHEET OR THE MOST RECENT PURCHASE SPECIFICATION.