

**LOADING AND UNLOADING PROCEDURES**  
**FOR**  
**CLAUS CATALYSTS**  
**SULPHUR RECOVERY UNITS**  
**BY**  
**DEVSON CATALYST PRIVATE LIMITED**

### **CATALYST LOADING:**

1. Shift the fresh catalyst Drums and the ceramic Balls to the loading point near the vessel site.
2. Ensure that vessel entry permit is provided as per site regulations. Inspect the vessel from inside for cleanliness and damage to the grating structure and the wire mesh etc. Any damage should be rectified before the catalyst loading operation is undertaken. Ensure that the person entering the vessel is provided with all necessary personal protective equipment.
3. After the clearance is obtained for loading of the catalyst, mark at four points in each section,(inside the vessel) the levels for first level of ceramic balls ( OR Active Alumina bed support, as per the original bed design) and the catalyst bed level and ceramic / Alumina balls top layer, as per the loading diagram.
4. Load the bottom most layer of the Bed support balls manually OR by sock loading as per the design height and spread uniformly on the support grid.
5. Similar way load the next layer of the Claus catalyst on the first layer of Active Alumina Balls.
6. Start loading the catalyst from the Top catalyst loading nozzle through telescopic chute OR through loading hose pipe. Ensure that the free fall of the material is not more than 1 Meter.
7. After loading first layer of 300 mm of catalyst, the catalyst should be levelled by shovelling. Person should stand on the wooden planks while doing this work.
8. After loading the catalyst as above, the balance quantity of catalyst can be loaded directly from the loading nozzle. Ensure slow dumping and not more than 1 Me free fall.
9. It is advisable that the catalyst be levelled after each 300 mm loading before loading further quantity.
10. Load total no of required Drums / Jumbo Bags in the vessel till bed height as per the loading Diagram is obtained.
11. Level the top surface of the catalyst Bed.
12. Load Bed topping (Active Alumina / ceramic Balls) top layer on the catalyst Bed as per the design height.

### **CHECKS BEFORE VESSEL CLOSING:**

1. Check the catalyst Bed for any external material left inside the vessel such as shovels, planks, hand gloves etc.
2. Box up the manhole and make the vessel ready for purging.
3. Install the instruments on the vessels such as differential pressure Gauge, pressure Gauges, Temperature gauges, purge and vent valves etc. as per the P&I Diagram.

### **CATALYST STARTUP:**

1. Box up all the manholes and pressure Test the vessel with N<sub>2</sub> Gas as per the design pressure requirement.
2. Rectify any leakages found.
3. Purge the system with N<sub>2</sub>, till it is free of air / Oxygen.
4. Claus catalyst does not require any pre-treatment OR activation before the start up.
5. Follow the start-up procedure as provided by the process licensors.
6. Monitor the Gas composition at each vessel inlet and outlet streams as per the plant schedule to check for conversion of H<sub>2</sub>S to elemental Sulphur

### **CATALYST UNLOADING:**

1. After isolating the vessel with blinds, Purge the vessel with Nitrogen until the H<sub>2</sub>S and SO<sub>2</sub> content in the stream is below permissible limits for vessel entry.
2. Continue purging till the catalyst bed temperature is less than 50 Deg. C.
3. Open the top manholes of the vessel in each section and then open the bottom manhole.
4. Remove a part of the grid and the mesh (which support the Catalyst) so that catalyst can be dumped in the bottom part of the vessel. Provide an open channel OR chute to the manhole in the bottom part, so that the spent catalyst can be unloaded from vessel and loaded directly in the drum or Jumbo Bag for disposal.
5. Open the manhole slowly and fill the drums / jumbo bags one by one slowly till the vessel is empty. It is also possible to dump the spent catalyst on the ground and fill the drums later when the catalyst is further cooled.
6. It is advisable to keep the water hose running all the time during the unloading of the catalyst.

7. Spray water on the catalyst if any combustion activity is observed during the unloading operation. Claus Catalyst is non-combustible and non-flammable in nature and does not cause any combustion hazard.
8. Open all the manholes and clean the vessel from inside. Inspect the grid and the wire mesh and carry out repairs if required.

**LIABILITY:**

*Devson Catalyst is issuing these instruction, prepared by specialists, which are of general nature based on available Technical knowledge. Devson does not have full Data and knowledge of customer's plants or operations. Therefore, Devson does not assume any liability for the upsets or damages to the customer's plant and machinery and personnel. Devson requests the customers to follow the instructions given by their Licensors.*

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