

STORAGE AND HANDLING CONDITIONS FOR SPECIAL METALS WELDING CONSUMABLES

Shielded Metal Arc Welding Electrode.

The flux coating on Shielded Metal Arc Welding (SMAW) electrodes is hygroscopic or moisture absorbing. The amount of moisture absorbed is dependent on the atmospheric conditions of temperature and humidity experienced by the electrode after the packaging has been opened. The amount of moisture, which is absorbed, increases with time of exposure.

During the manufacturing process SMAW electrodes are baked at a high temperature and following manufacture the flux coating has a low moisture content. Prior to use, electrodes should be left in their unopened original moisture proof hermetically sealed containers and stored in a dry area. Once the container is opened, the deep seating lid should be replaced as the lid provides an effective barrier to moisture ingress. Once the container is opened, the electrodes should be stored in a cabinet equipped with either a desiccant or heated to 10-15°F (6-8°C) above the highest expected ambient temperature or both.

Electrodes which have absorbed excessive moisture should be re-baked in a vented oven at 600°F ±25°F (315°C±15°C) for one hour or 500°F±25°F (260°C±15°C) for two hours. Electrodes must be removed from their original containers during this re-baking operation. Electrodes should not be stacked more than 6 layers deep on shelves within the oven. Most electrodes can be re-baked at least 2-3 times without substantially affecting both the integrity of the flux coating and their welding performance. Following the re-baking operation the electrodes should be allowed to cool to room temperature prior to use.

A common problem that may occur is the uneven absorption of moisture by the electrodes. For example, electrodes exposed overnight may exhibit "fingernailing" (uneven burn-off on one side of the electrode) problems during welding when used the next day. In this instance the reason that "fingernailing" occurs is due to moisture being absorbed by only one side of the electrode causing that side to burn off more slowly and unevenly. Correct storage conditions will prevent this type of "fingernailing" problem.

Submerged Arc Welding Fluxes.

Agglomerated submerged arc welding (SAW) fluxes are manufactured using minerals and metallic powders held together by silicate binders. Fused fluxes are manufactured using minerals, which are melted to form a glass, which is subsequently crushed to form the flux particles. Submerged arc welding fluxes absorb moisture with the amount of moisture absorbed being dependent upon the atmospheric conditions and time of exposure. Most of the Special Metals fluxes are supplied in air tight 90 mil plastic buckets with an 'O' ring seal in the lid. The 'O' ring seal is an effective moisture barrier that works when the bucket is both opened and re-sealed correctly to allow the 'O' ring to seat properly. To open the bucket of flux, the embossed tab on the lid must be pulled, or cut free, and then peeled loose from the lid. This removes a thin ring of plastic from the circumference of the lid. Once this ring of plastic is removed, the lid is quickly and easily opened and resealed. Properly seating the 'O' ring is necessary in order to prevent any flux that remains in the bucket from absorbing moisture. INCOFLUX 9 is supplied in heavy duty plastic sacks. Fluxes should be stored in a dry area and labels should never be removed from the packaging.

Submerged arc welding fluxes can be re-baked if it is suspected that the flux has absorbed excessive moisture. Re-baking should be performed at 700-900°F (375-480°C) for two hours in a vented oven for all INCOFLUX fluxes except INCOFLUX 9. For INCOFLUX 9 re-baking should be conducted at 300-480°F (150- 250°C) in a vented oven. Flux should be placed on metal trays with a maximum flux depth on the tray of 2" (50mm). The plastic buckets and plastic sacks should not be baked.

Flux re-cycling.

- ▶ Flux can be re-cycled successfully and the following guidelines should be adopted for flux re-cycling:- During continuous welding operations unused flux can be recycled and returned to the flux hopper for re-use.
- ▶ Slag and metallic particles should be removed from the recycled flux and discarded prior to using recycled flux.
- ▶ Fines should be removed from recycled flux. Excessive levels of fines will impair the welding performance of the flux and degrade the weld bead appearance.
- ▶ Re-crushed slag should not be used as flux for welding operations.
- ▶ Following a break in welding operations any unused flux should be removed from the welding machine hopper and stored in a heated hopper (250-300°F, 120-150°C) for a maximum period of 24 hours. This flux should then be mixed with twice its volume of new flux prior to reuse.
- ▶ Care should be taken when using forced air recycling systems to ensure that such systems use only dry air and that the flux particles are not damaged or degraded by using high air flow rates (which can result in the formation of large quantities of dust). Only dry air must be used in forced air recycling systems to prevent moisture pick up by the flux. Compressed air systems used for operating power tools should not be used for flux recovery as they may contain oil lubricant.

Bare Wire.

Bare wire products used for GMAW (MIG), GTAW (TIG) and SAW welding should be kept in a dry store prior to use. Containers should be kept closed when not in use. Spooled wire is supplied packed in plastic bags and part used coils should be replaced into a plastic bag for storage to prevent surface contamination. Wire should be stored at ambient conditions of temperature and humidity, and dusty areas should be avoided when wire is not enclosed in some type of dust-protecting container. Cut-length wire used for GTAW welding should be protected from dust and airborne contamination after removal from the packaging. All bare wire should be protected from surface contamination (dust, grinding particles etc.) when in use and during storage.

Flux Core Wire.

Flux cored wire storage conditions are similar to those for SMAW electrodes. Flux cored wires are packaged in plastic bags containing desiccant which protects the wire from moisture pick up. Cartons should be protected from water damage and the labels should never be removed. Part used coils of wire should be stored in a sealed cabinet equipped with desiccant or heated to a temperature 10-15°F (6-8°C) above ambient or both. If the flux cored wire is suspected of picking up excessive levels of moisture please contact the Technical Department at Special Metals Welding Products Company for advice on potential re-baking of the wire.