

Roofinox Soldering

Soldering is the creation of a durable but detachable joining of two metals by melting a filling metal into a joint. This soft soldering process requires temperatures below 842°F, the typical soldering temperature for stainless steel tin-solder is around 480°F.

Due to its specific surface Roofinox® stainless steel is readily solderable. The surfaces to be joined must be free of grease, dirt or other foreign matter. Stainless steel requires some adaptations such as a different flux than for copper and zinc. With the use of proper flux, techniques and tools Roofinox is easily solderable and provides durable water-proofing joints. By observing the following points, you will achieve an outstanding soldering quality.

For durable and clean soldering joints the following tools are required:

- Soldering iron with soldering bit
- Solder (30 %, 40 %, 50 % solder possible)
- Soldering stone / ammoniac stone
(pure ammoniac, no tinned ammoniac stone)
- Flux - Roofinox FLM
- Flux brush
- Cleaning tissue
- Fresh water



Flux

For Roofinox and Roofinox tin-plated fluxes based on phosphoric acid are suitable. Not suitable are fluxes based on hydrochloric acid or dilute hydrochloric acid or containing chloride ions. The industry offers a range of soldering fluxes suitable for stainless steel. Best results are achieved with Roofinox FLM. Roofinox FLM guarantees sufficient removal of the thin passive layer and prevents its renewed formation during soldering. They provide optimal wetting and cleanliness of the soldering area. If the soldered joint will be subjected to particular stress, please contact us. Conducting a solder test is recommended before beginning the job to ensure that the desired result will be achieved. Residues of flux absolutely have to be removed. We recommend cleaning the soldering joint area with fresh water.

Cleaning

Dirt and debris makes soldering difficult and must be removed before soldering.

Solder

For Roofinox and Roofinox tin-plated tin/lead alloys are generally used. The tin portion typically ranges from 30% to 50%. 100% tin solder is also available for lead-free applications. The solder may not contain more than 0.5% anti-mony. These solders, in conjunction with the Roofinox FLM flux, provide optimal gap filling, good wetting and high strengths. With the required soldering temperature of approximately 480°F, the melting range of this solder is well suited to guarantee good flow characteristics.

Soldering iron

Soldering irons with a minimum weight of .77lb assure sufficient heat storage, a weight of 1lb and higher is better suitable. The broad bearing surface (.2") of the soldering iron is important to assure even heat transfer onto the soldering joint. This quality is guaranteed with the appropriate care of the soldering iron.

Soldering joint

According to professional regulations soldering joints should be overlapping .4" to .6". Larger overlapping is not recommended as it can't be soldered properly and flux will remain in the overlap. This residue in combination with water will leak from the overlap and can discolor or cause streaking on the surface.

Soldering gap

The optimal soldering gap width is approximately .0012". This enables maximum gap filling through capillary filling pressure. The soldering gap must not expand in the flow direction. It must be constant or narrow slightly.

Riveting

Joints on gutters, attachment joints etc. are subjected to stronger mechanical stress, therefore a mechanical joint (rivet) is necessary. In this instance, solder has predominantly a sealing function. We recommend stainless steel rivets or Roofinox tin-plated stainless steel rivets that facilitate soldering.

Working instructions

Roofinox provides low thermal ductility, this requires a lower soldering temperature and sectional working. This should prevent overheating of the soldering area and thus preventing the solder from solidifying. The following working sequence is recommended:

1. Heating the soldering iron

Preheat the soldering iron including soldering bit to a temperature of approx. 480°F. A simple test will tell if you have reached the right temperature.



a. Soldering bit too hot: heavy smoke formation when dipping the soldering bit into salmiak stone (ammonium chloride / soldering stone)

b. Soldering bit at right temperature: smoke formation as of burning cigarette (approx. temperature 480°F)

c. Soldering bit too cold: no or very little smoke formation

As soon as the appropriate temperature is reached, lower the flame of the burner and keep this temperature.

2. Tinning of soldering iron

Before starting soldering cover the soldering bit with tin. To achieve this, clean the soldering bit in soldering stone and melt a thin layer of solder onto the bit.



3. Applying flux

Apply flux with a brush along the joint. This dissolves the passive layer and enables the bonding of solder and metal surface.



4. Tacking / riveting

Tack the two metals along the joint by applying solder. This will keep the two metals in position and will allow for a smooth soldering process.



Melt solder on soldering bit



Transfer solder to the tack spot and press the solder bar to the tack spot



Press the solder rod until the solder has cooled off and joins the metals, lift the soldering bit for faster cooling

5. Soldering

The main process aims at waterproofing and joining the two metal elements. Draw a continuous joint with molten solder. This will create a durable and waterproof joint.



Melt solder, transfer to joint and draw a seam through a continuous movement.



Repeat until soldering joint is completed.



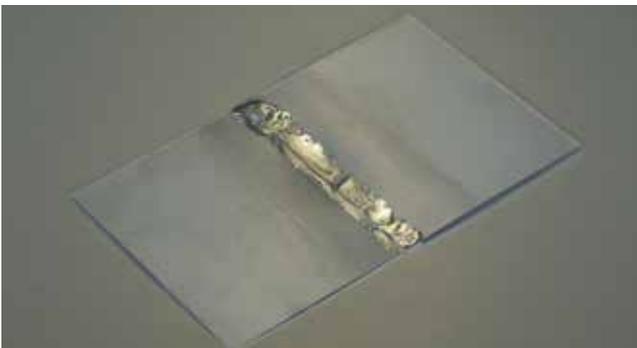
You can see if solder has cooled off enough when the solder surface tarnishes.

6. Cleaning

For cleaning procedure wet a cleaning tissue or cloth. Clean the joint thoroughly, remove all residues of flux. Should you have spilled flux, rinse with plenty of fresh water to prevent corrosion or discoloration.



7. Completed soldering-joint



Tacked, soldered, and cleaned!

Through extensive research and development we have created a flux specifically for Roofinox. It facilitates soldering and ensures enduring soldering joints.



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