

## **SOLDERING FLUXES.**

Substances that aid the flow of metals when melting or melted are termed fluxes. The general subject of fluxes is outside the province of this work. But special interest is taken in soldering fluxes, those fluxes that facilitate the flow of the solders and of the metals of which they are composed.

This fluxing consists in the prevention of the formation of oxide to which metals are very prone when highly heated or melted. The black scale that forms on the surface of copper, for instance on copper-bits, when highly heated, is an oxide, also the scale that falls off red-hot iron when hammered, and the dross that forms on the surface of melted lead or melted solder.

Charcoal is used for the purpose of preventing the formation of dross in the preparation of solder. Sometimes a layer of it is spread over the surface of the melted metal to keep it from contact with the air, sometimes a layer of grease.

In aiding the flow of metals, fluxes are further applied to the surface of the metals to be soldered, which they clean, as well as aiding the flow of the melted solder when that is applied.

Spirits of salts, muriatic acid, when killed is a most useful flux for soft solders. The killing is done by dissolving zinc in the acid till gas is no longer given off.

As the gas is most offensive, the dissolution of the zinc should be effected in the open air. This flux is not one to be used where rust would be serious, though there is very little danger of this, if, after soldering, the joint is wiped with a clean damp rag, and further cleaned with whiting.

Rosin or rosin and oil is a good flux for almost any kind of soft soldering. The surface to be soldered must, however, be well cleaned before applying the flux.

Killed spirits of chloride of zinc is specially useful for tin-plate soldering, because it assists in cleaning the edges to be joined, while if rosin, or rosin and oil, is used, the edges must, as stated, be cleaned previously.

Spirits of salts not killed is used for soldering zinc because it cleans the surface of the zinc, it acts as chloride of zinc, for this is what it becomes on the application to the zinc, in fact the cleaning is the result of this chemical action. The killed spirits, however, answers equally well as the strong acid if the zinc is bright and clean. The unkilld spirits of salts is improved, as a flux for soldering zinc, by adding a small piece of soda to it.

Powdered rosin, or rosin and oil, as a flux, possesses the great advantage over chloride of zinc, that there is no risk of rust afterwards. For this reason rosin, or rosin and oil, is much used in the manufacture of gas-meters. It is also used, or should be, for the bottoms and seams of oil cans. The rosin and oil flux can easily be wiped off joints immediately after soldering, it is for this reason better than dry rosin which has to be scraped off. Even this trouble, however, can

be got over if the hot copper-bit is dipped in oil before application to the joint to be soldered.

In tinning a copper-bit, that is, coating its point with solder before using it in soldering, the best thing to use is a lump of salammoniac. In a small hollow made in the salammoniac, the point of the bit, after having been filed smooth and bright, should be well rubbed, while hot, along with some solder, the point of the bit will then become coated with solder. For tinning copper utensils, that is, coating them with tin, salammoniac both in powder and lump is largely used. Salammoniac water is also used for cleaning copper-bits, the hot copper-bits being dipped into it prior to being used for soldering. Killed spirits, however, acts better. Salammoniac and rosin, mixed, is used as a flux for soldering sights on gun-barrels.

As a flux for lead soldering, plumbers use tallow.

For hard soldering, the flux is borax. This flux is also made use of in steel welding.