

COVERING FLUX, protecting and cleaning molten aluminum and its alloys.

PRODUCT DESCRIPTION

There are many formulations of fluxes designed to be used on a range of aluminum and aluminum-magnesium alloys in a variety of melting unites. They are in powder form or tablet form and supplied in 2Kg/bag and 20Kg/carton.

PRODUCT FUNCTION

The C-YU flux range has many functions as follows:

- Covering, protecting and dross-off aluminum and aluminum-alloy melts during melting.
- Covering, protecting and washing aluminum/magnesium alloys.
- Dross-off aluminum and aluminum/magnesium alloys with the minimum of metal loss.
- Reclaiming swarf, skimming and turnings to obtain a good metal yield.
- Recovery of aluminum from skimming.
- Cleansing and modifying aluminum/silicon alloys.
- Removal of oxide build-up from furnace walls.

PRODUCT SELECTION

Since there are very many products in the flux range, the main ones have been extracted and are shown in the table on the following pages. Each product is related to its function, type of dross, melting unit where it is applied, and the alloy which it treats. When all these factors are considered, there is very little duplication for the dictates of specific applications, and that only from considerations of economy and efficiency.

Product	Flux type	Melting point °C	Dross type	Melting unit	Alloy types	Remarks
C-DZ-11	Dross-off	650	Dry	Reverberatory, Rotary, Tilter Furnace	All aluminum alloys except those containing high magnesium	
C-BZ-Na	Modifying	670	Liquid	Crucible, bale-out	High silicon alloys up to eutectic	Used at temperatures between 730-760°C
C-DZ-56	Dross recovery	635				For recovery of aluminum from hot drosses
C-DZ-66	Covering Dross-off		Dry	Crucible, bale-out	Alloys containing 1-10% magnesium and hypo-eutectic aluminum silicon alloys.	Sodium-free
C-D-2 C-D-1	Dross-off		Dry	Crucible	As CDZ-11	Especially for pressure diecasting application. Used on a wide range of temperatures in diecasting.
C-F	Covering	650	Dry	Reverberatory, Rotary, Tilter	All aluminium alloys except those containing	

C-GMF	Covering	450	Liquid	Furnace Reverberatory, Rotary, Tilter Furnace Reverberatory,rot ary	high magnesium Alloys containing 1-10% magnesium	Sodium Free
C-QL	Furnace cleaning			and transfer lade (if separately heated)		To remove oxide build-up formed on furnace walls

Notes:

1. The melting points in this table are as determined under laboratory conditions.
2. If liquid flux is required,it is essential to select one with a melting point some 50°C below the pouring temperature of the alloy.

PRODUCT APPLICATION

The variety of fluxes requires that each group be dealt with in turn.

Covering and protecting during melting

- Aluminum alloys and aluminum/magnesium alloys up to 2% magnesium are usually treated with dry fluxes in crucible and induction melting and with liquid fluxes in reverberatory, rotary and large electric furnace melting. The required flux is selected from the flux table. Sufficient C-F to form a cover, approximately 0.5 to 1.0% by weight, is added, preferably in two stages, half early in the melting procedure and the remainder as soon as the charges are fully molten. The cover should be kept intact if possible until the melt is ready for degassing and grain refining.
- Aluminum/magnesium alloys containing more than 2% magnesium are treated with one of the several fluxes shown in the flux table. In the case of C-JL-8 approximately 0.5% of the product is put onto the solid charge and a further 2% is sprinkled evenly over the surface when the surface when the alloy is fully molten. When the flux becomes pasty or liquid about 750°C,the flux is worked well into the melt with a bell plunger for about three minutes.

Dross-off before pouring

The function of a dross-off flux is to absorb oxides and non-metallic material, cleansing the metal and forming a good metal-free dross which can be easily removed.

- In crucible furnaces, when dross-off is carried out, the crucible sides are scraped and the required quantity of the selected C-D-1 or C-D-2(250 grams is normally adequate for the lift-out or bale-out furnace) is sprinkled onto the metal surface along with the existing flux cover and mixed into the surface of the metal until a red-glowing dross is obtained. This exceptionally free of metal and can be removed with a perforated skimmer or ladle.
- In reverberatory furnace, the quantity of flux needed will depend on the cleanliness of the charge material and on the surface area of the metal. The behaviour of the flux will indicate whether the dosage needs to be reduced or increased in future applications.

When the melt is ready for dross-off, the flux is spread over the metal surface, allowed to stand for a few minutes until fused and then rabbled or puddle into the dross for several minutes with a skimmer. For best results the melt should preferably be in excess of 700°C although fluxes will function well at temperatures below 650°C.The furnace is then closed an the flame turned on for ten minutes. This helps to activate the flux, heating the dross and giving good metal separation. The dross is

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then pulled to the door, allowed to drain and transferred to a dross bogey. If the dross in the bogey is raked, further metal will collect in the bottom.

Reclamation of swarf, skimmings and turnings

A heel of metal is melted using heavy scrap or ingot and a quantity of flux is added to form a fluid cover. The amount of C-D-11 depends on the degree of dirtiness and oxidation of the scrap and will vary between five and 25% by weight. The swarf, turnings, etc., are fed through the flux cover a little at a time, into the melt adding more flux as required to keep the cover in a fluid condition. The temperature of the melt is kept relatively low during this procedure, and, when charging is complete, the heat is raised to pouring temperature. At this stage the flux may be poured off from rotary or reverberatory furnace but there is a significant advantage to be obtained by passing more than one melt through the same flux(duplexing).

Reclamation of aluminum from hot skimmings

C-DZ-56 is a flux specifically designed for the purpose of treating dross as soon as they are skimmed off into dross carts. Even where a dross has been treated in a furnace with C-DZ-11 there is still sufficient metal retained to make a further recover. The dross and C-DZ-56 are added alternately into a dross cart in sandwich fashion, the application rate of the flux being about 10% by weight. An efficient exothermic reaction ensues and molten aluminum runs from the base of the cart into a suitable receptacle. The dross/C-DZ-56 mixture should be stirred and pressed down until no further aluminum flows from the base.

Modifying aluminum/silicon alloys

The metallurgical structure of aluminum alloys containing more than 9% silicon is modified to increase ductility. This is done by the introduction of sodium salts(C-BZ-Na).

The metal is melted down under C-DZ-11 and ,when the required temperature is reached, the melt is degassed and skimmed clean. The modifying flux is then sprinkled evenly over the metal surface and, when pasty or fluid, is worked into the melt for approximately three minutes. After standing quietly for a further five to ten minutes or until the pouring temperature is reached, the melt is dross-off with C-DZ-11 and then skimmed.