

## Handy Flo® 440 & Handy Flo® 445

### ***GENERAL DESCRIPTION***

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Handy Flo 440 and Handy Flo 445 are fluxless binder systems used in controlled atmosphere furnace brazing of steel assemblies in either exothermic or endothermic furnace atmospheres. When blended with an appropriate copper, bronze or nickel base braze filler metal, both systems will form high strength joints on most ferrous and non-ferrous base metals.

Handy Flo 440 and Handy Flo 445 are recommended for use in an atmosphere furnace with a minimum dew point temperature of +40°F. Flow characteristics are the primary differences between the products. Handy Flo 440 is a restrictive system, while Handy Flo 445 is more free flowing. Both binder systems exhibit excellent slump characteristics, whereby the paste deposit will remain in place during the initial stages of heating and not slump out of the joint area. Both products have been formulated for dispensing applications using automated dispensing equipment. When used in conjunction with either an atmosphere as described above or else carbide forming elements, Handy Flo 440 and 445 will burn clean and leave very little residue.

### ***PRODUCT APPLICATION***

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Handy Flo 440 and Handy Flo 445 are recommended for use with braze filler metals that flow above 1900°F (1038°C) and include: pure copper, bronze alloys, copper-nickel alloys and copper/cuprous oxide.

### ***BRAZING CHARACTERISTICS***

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Handy Flo 440 offers excellent vertical slump characteristic. The paste deposit will remain in place and will not spatter during the initial stages of the heating process. It is a restrictive system with no flashing ability once in molten form. Handy Flo 440 dries slowly and will not flake off the parts prior to heating operation; this allows pre-pasting of assemblies several hours prior to brazing operation. Handy Flo 440 is exceptionally clean burning. There is no residue following the brazing process. This product is not recommended for dry hydrogen (H<sub>2</sub>) atmosphere or vacuum.

Handy Flo 445 offers excellent vertical slump characteristics. The paste deposit will remain in place and will not spatter during the initial stages of the heating process. It is a free flowing system. The filler metal will flash once molten. Handy Flo 445 will not flake off the parts prior to heating operation; this allows pre-pasting of assemblies several hours prior to brazing operation. This product is not recommended for dry hydrogen (H<sub>2</sub>) atmosphere or vacuum.

### ***WARRANTY & STORAGE***

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Lucas-Milhaupt, Inc. warrants their Brazing and Soldering Paste products for 90 days from the date of shipment if stored in the original unopened container. Optimal storage conditions would be 65°F (18°C) - 75°F (24°C), clean and dry. It is recommended that the paste products are stored away from direct heat. Paste may require mixing to regain a homogenous mixture before application.

The 90 day warranty should not be interpreted as the shelf or useful life of the product. The paste products may be used well beyond the 90 day warranty, unless customer testing or production results indicate unsatisfactory performance of the product.

### ***AVAILABLE PACKAGING***

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Handy Flo and DF products are available in various size syringes, jars and cartridges. Paste may also be obtained in large containers prepackaged for immediate pneumatic dispensing operations.

## ***SPECIFICATIONS***

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Handy Flo 440 conforms to the following specifications: N/A

Handy Flo 445 conforms to the following specifications: N/A

## ***APPLICABLE PRODUCT CODE(S)***

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The applicable Lucas-Milhaupt product code(s) for this technical data sheet: 83-440,83-445.

## ***SAFETY INFORMATION***

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The operation and maintenance of brazing equipment or facility should conform to the provisions of American National Standard (ANSI) Z49.1, "Safety in Welding and Cutting". For more complete information refer to the Material Safety Data Sheet for Handy Flo 440 or Handy Flo 445.

## ***WARRANTY CLAUSE***

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