

# Solder Wires

## Lead Free



### Features:

- Multicomp Typ 400, 505 and 511 solid fluxes for cored solder wires have been specially formulated to complement no clean wave and reflow soldering processes
- They are also applicable to repair operations carried out after a cleaning process, eliminating the need for further cleaning
- Halide free version – Typ 400 : Mild odour
- Fast soldering - range of activities to suit all applications : Clear residues
- Good spread on copper, brass and nickel : Heat stable - low spitting

### Product Range:

Multicomp Typ 400 is designed for users who require a halide free formulation. The remaining products in the range contain higher halide levels to maximise soldering power

Multicomp Typ 400, 505 & 511 cored wires are manufactured with a range of flux contents. Although users will normally be using products with a nominal flux content of 3%, the superior performance of the Multicomp Typ 400, 505 & 511 products may allow a lower flux content to be specified e.g. 2.2%. This will further improve residue appearance by reducing the quantity

All are available in alloys conforming to national and international standards, including lead free alloys

### Recommended Operating Conditions:

**Soldering iron:** Good results should be obtained using a range of tip temperatures. However, the optimum tip temperature and heat capacity required for a hand soldering process is a function of both soldering iron design and the nature of the task and care should be exercised to avoid unnecessarily high tip temperatures for excessive times. A high tip temperature will increase any tendency to flux spitting and it may produce some residue darkening

The soldering iron tip should be properly tinned and this may be achieved using Multicomp Typ 400, 505 & 511 cored wire. Severely contaminated soldering iron tips should first be cleaned and pre-tinned using a soldering iron tip tinner, then wiped on a clean, damp sponge before re-tinning with Multicomp cored wire

**Soldering process:** Flux cored wires Typ 400; 505 and 511 contain a careful balance of resins and activators to provide clear residues, maximum activity and high residue reliability, without cleaning in most situations. To achieve the best results from solder wires, recommended working practices for hand soldering should be observed as follows:

Apply the soldering iron tip to the work surface, ensuring that it simultaneously contacts the base material and the component termination to heat both surfaces adequately. This process should only take a fraction of a second.

Apply flux cored solder wire to a part of the joint surface away from the soldering iron and allow to flow sufficiently to form a sound joint fillet - this should be virtually instantaneous. Do not apply excessive solder or heat to the joint as this may result in dull, gritty fillets and excessive or darkened flux residues

Remove solder wire from the workpiece and then remove the iron tip

The total process will be very rapid, depending upon thermal mass, tip temperature and configuration and the solderability of the surfaces to be joined

Multicomp flux cored solder wires provide fast soldering on copper and brass surfaces as well as solder coated materials.

Activity of the halide activated versions on nickel is also good depending on the state of oxidation of the nickel finish. The good thermal stability of fluxes Typ 400, 505 & 511 means, they are also well suited to soldering applications requiring high melting temperature alloys

The resin and flux systems are designed to leave relatively low residues and to minimise residual activity. This is achieved by ensuring some decomposition and volatilisation takes place during the soldering process. In some situations, this may generate visible fuming but in all cases, rosin fumes must be removed from the breathing zone of operators

**Cleaning:** In most industrial and consumer electronics applications cleaning will not be required and the product may therefore be used to complement a no clean wave soldering or reflow process or to allow repairs to cleaned boards without the need for a second cleaning process

Should cleaning be required, this is best achieved using a special solvent cleaner. Cleaning through saponification is not recommended

### Technical Specification:

**Alloys:** The alloys used for Multicomp Typ 400, 505 & 511 cored solder wires conform to the purity requirements of the common national and international standards. A wide range of wire diameters is available manufactured to close dimensional tolerances

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Flux: The solid fluxes are based on modified rosins and carefully selected activators. In use they exhibit a mild rosin odour and leave a small quantity of clear residue

| Kristall Flux Properties                                                     |                         |                         |                         |
|------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|
| Test                                                                         | 400                     | 505                     | 511                     |
| Acid Value mg / KOH / g                                                      | 215                     | 170                     | 170                     |
| Halide Content %                                                             | 0                       | 0,5                     | 1,1                     |
| J-STD-004<br>-Solder Spread mm <sup>2</sup><br>-Corrosion Test               | 210<br>Pass             | 315<br>Pass             | 340<br>Pass             |
| SIR Test (Without Cleaning)<br>-IPC-SF-818 Class3<br>-Bellcore TR-NWT-000078 | Pass                    | Pass                    | Pass                    |
| Elektromigration-Test SIR Test (Without Cleaning) Bellcore TR-NWT-000078     |                         |                         |                         |
| Classification<br>-EN 29454-1<br>-J-STD-004<br>-IPC-SF-818                   | 1.2.3<br>RO L0<br>LR3CN | 1.2.2<br>RO M1<br>MR3CN | 1.2.2<br>RO M1<br>MR3CN |

Cored wire: Multicomp Typ 400, 505 & 511 cored solder wires are designed to give fast and sustained wetting on both copper and brass. This can be demonstrated using spreading tests on both substrates under standard conditions for the Multicomp products and comparable competitor products. After 5 seconds, area of spread is measured to form a comparative index indicating total flux efficacy

Multicomp Typ 400, 505 & 511 flux cored solder wires out-perform competitor products, which required a higher flux content and leave more residues whilst achieving poorer spread

| Relative Wetting Performance of Multicomp Solder Wire and Halide Free Competitor Products * |                                 |                 |                |
|---------------------------------------------------------------------------------------------|---------------------------------|-----------------|----------------|
| Product                                                                                     | Area of Spread, mm <sup>2</sup> |                 |                |
|                                                                                             | Flux Content %                  | Oxidised Copper | Oxidised Brass |
| Type 400                                                                                    | 2.2                             | 222             | 209            |
| Competitor A                                                                                | 3.5                             | 191             | 140            |
| Competitor B                                                                                |                                 | 202             |                |

\* Oxidised for 1 Hour at 205°C

| Relative Wetting Performance of Multicomp Solder Wire and Halide Free Competitor Products * |                |                  |                                 |                |
|---------------------------------------------------------------------------------------------|----------------|------------------|---------------------------------|----------------|
| Product                                                                                     | Flux Content % | Halide Content % | Area of Spread, mm <sup>2</sup> |                |
|                                                                                             |                |                  | Oxidised Copper                 | Oxidised Brass |
| Competitor E                                                                                | 2              | 0.4              | 200                             | 150            |
| Competitor F                                                                                | 2.4            |                  | 190                             | 180            |
| Competitor G                                                                                | 3.5            |                  | 150                             | 120            |
| Competitor H                                                                                | 2.7            | 0.5              | 230                             | 150            |
| Type 505                                                                                    | 3              |                  | 220                             | 240            |

\* Oxidised for 1 Hour at 205°C

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**Relative Wetting Performance of Multicomp Solder Wire and Halide Free Competitor Products \***

| Product      | Flux Content % | Halide Content % | Area of Spread, mm <sup>2</sup> |                |
|--------------|----------------|------------------|---------------------------------|----------------|
|              |                |                  | Oxidised Copper                 | Oxidised Brass |
| Typ 511      | 3              | 1.1              | 270                             | 390            |
| Competitor J | 2.2            | 1.2              | 260                             | 190            |
| Competitor K | 2              | 1.6              | 210                             | 230            |

### Part Number Table

| Description                          | Part Number |
|--------------------------------------|-------------|
| Solder Wire, Lead Free, 0.5 mm, 250G | 812040      |
| Solder Wire, Lead Free, 0.7 mm, 250G | 507-1380    |
| Solder Wire, Lead Free, 0.9 mm, 250G | 507-1392    |
| Solder Wire, Lead Free, 1.2 mm, 250G | 507-1409    |
| Solder Wire, Lead Free, 0.7 mm, 500G | 507-1422    |
| Solder Wire, Lead Free, 0.9 mm, 500G | 507-1434    |
| Solder Wire, Lead Free, 1.2 mm, 500G | 507-1446    |
| Solder Wire, Lead Free, 0.5 mm, 250G | 509-0593    |
| Solder Wire, Lead Free, 0.7 mm, 250G | 509-0600    |
| Solder Wire, Lead Free, 0.9 mm, 250G | 509-0611    |
| Solder Wire, Lead Free, 1.2 mm, 250G | 509-0623    |
| Solder Wire, Lead Free, 0.7 mm, 500G | 509-0647    |
| Solder Wire, Lead Free, 0.9 mm, 500G | 509-0659    |
| Solder Wire, Lead Free, 1.2 mm, 500G | 509-0660    |

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