

# WEARcore Tool NiCrNb

## Gas-shielded nickel flux cored wire for forging applications

WEARcore Tool NiCrNb is a nickel special alloy providing strengthening effect at high temperature due to the precipitation of  $\text{Ni}_3\text{Nb}$  and  $\text{Ni}_3\text{Al}$  phases. Enhanced weldability.

| Product features                                                                                                                            | Customer benefits                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>» Innovative chemical composition</li> <li>» Precipitation hardening at high temperatures</li> </ul> | <ul style="list-style-type: none"> <li>» Improved lifetime of tools used in open-die forges</li> <li>» Excellent hardness at high temperatures</li> <li>» Crack resistant weld overlay</li> <li>» Machinable with metallic carbide tip tools</li> </ul> |
| <ul style="list-style-type: none"> <li>» Optimized welding behaviour</li> </ul>                                                             | <ul style="list-style-type: none"> <li>» Excellent arc stability</li> <li>» No defects &amp; porosity free weld overlay</li> <li>» Automation of the welding operations</li> </ul>                                                                      |

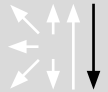
- » **Microstructure:** Solid solution with intermetallic precipitates  $\text{Ni}_3\text{Nb}$  /  $\text{Ni}_3\text{Al}$
- » **Machinability:** Good with metallic carbide tipped tools
- » **Oxy-acetylene cutting:** Cannot be flame cut
- » **Deposit thickness:** Depends upon application and procedure used
- » **Shielding gas:** Argon
- » **Liner:** A Teflon liner is advised



## Typical applications

- » Forging Tools subjected to impacts at high temperatures
- » Manufacture and repair of Gyratory Forging Machine (GFM)
- » Hammers – shape, refine and deform hot metal through repeated, high impact blows
- » Anvil dies – Used for drawing, flattening
- » Saddles – Support large shafts during press forging
- » Hot cutters – Cut bar or separate section while hot

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| Classifications | Operating data                                                                    |          |               |
|-----------------|-----------------------------------------------------------------------------------|----------|---------------|
| EN ISO 14700    | Welding positions                                                                 | Polarity | Shielding gas |
| T Z Ni2         |  | DC+      | Argon - I1    |

| Typical chemical composition, all weld metal, wt. % |      |     |     |      |         |     |   |    |    |
|-----------------------------------------------------|------|-----|-----|------|---------|-----|---|----|----|
| Shielding gas                                       | C    | Si  | Mn  | Cr   | Ni      | Nb  | W | Al | Fe |
| I1                                                  | 0,01 | 0,3 | 0,4 | 22,0 | balance | 9,5 | + | +  | 2  |

| Hardness – All-weld metal (Typical values) |           |                                      |                            |                            |
|--------------------------------------------|-----------|--------------------------------------|----------------------------|----------------------------|
| Shielding gas                              | As welded | Age Hardening<br>720°C/8h + 620°C/8h | Age hardening<br>700°C/10h | Age hardening<br>700°C/50h |
| I1                                         | 215 HB    | 45 HRC                               | 44 HRC                     | 46 HRC                     |

| Recommended welding parameters |                 |                |                   |                     |                 |
|--------------------------------|-----------------|----------------|-------------------|---------------------|-----------------|
| Wire diameter<br>[mm]          | Amperage<br>[A] | Voltage<br>[V] | Stick-Out<br>[mm] | Gas-Rate<br>[L/min] | Weaving<br>[mm] |
| 1,6                            | 200-300         | 27-30          | 20 max.           | 15-20               | 15 mm           |

| Welding Instructions                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Clean welding area to a bright metallic finish. Typical preheating temperature for hot work tool steels is between 300-400°C. Minimise dilution by welding with low heat input. A neutral torch angle and weave beads are recommended. Welding with GMAW-Pulse process is also possible. For thick weld deposits on forging saddles, build-up should be done with Thermanit Nicro 82, final layers with WEARcore Tool NiCrNb.</p> |

| Overview spool types                                                                |                                                                      |                               |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------|
| Wire basket spool BS300                                                             |                                                                      |                               |
|  | Precision layer wound                                                | Available spool weight: 15 kg |
|                                                                                     | Dimensions:<br>Ø external 300 mm<br>Ø internal 52 mm<br>Width 100 mm | Available diameters: 1,6 mm   |