

EN 1600: 1997: E 22 9 3 N L B 2 2
 AWS A5.4-92: E2209-15

BÖHLER FOX CN 22/9 N-B

**SMAW basic electrode, high-alloyed,
high corrosion resistant**

Description

Basic electrode, core wire alloyed, for welding of ferritic-austenitic duplex materials, e.g. 1.4462, UNS S31803. Besides the high tensile strength, the special advantage of the weld metal of this electrode is its very good toughness behaviour down to -60°C . Furthermore the high crack resistance of the weld metal and the particularly good resistance to stress corrosion cracking and pitting behaviour are significant features. FOX CN 22/9 N-B is specially designed for the joining of thick-walled sections (e.g. $>20\text{ mm}$) and rigid constructions as well as for applications where extra low service temperature requirements exist. The Pitting Resistance Equivalent (PRE_{N}) shows values of ≥ 35 in accordance with the formula $(\% \text{Cr} + 3.3\% \text{Mo} + 16\% \text{N})$. The pitting resistance according to ASTM G48 / method A shows good results. The electrode provides user friendly operating characteristics in all positions except vertical down with good slag removability and weld bead appearance. Additionally the filler metals offer high safety against the formation of porosity.

Typical Composition of All-weld Metal

| | C | Si | Mn | Cr | Ni | Mo | N | PRE_{N} |
|------|-------------|------------|------------|-------------|------------|------------|-------------|-----------------------------|
| wt-% | 0.03 | 0.3 | 1.1 | 22.6 | 8.8 | 3.1 | 0.16 | ≥ 35 |

Mechanical Properties of All-weld Metal

| | u | |
|---|------------|--------------------------|
| yield strength R_e N/mm ² (MPa): | 630 | (≥ 540) |
| tensile strength R_m N/mm ² (MPa): | 830 | (≥ 690) |
| elongation A ($L_0=5d_0$) %: | 27 | (≥ 22) |
| impact work ISO-V KV J | +20°C: | 110 (≥ 47) |
| | -20°C: | 90 |
| | -40°C: | 75 (≥ 32) |
| | -60°C: | 40 |

u untreated, as-welded

Operating Data

| | | | | |
|---|------------------|------|---------|-----------|
|  re-drying: 250-300°C, min. 2 h electrode identification: FOX CN 22/9 N-B 2209-15 E 22 9 3 N L B | \varnothing mm | L mm | amps A | =+ |
| | 2.5 | 350 | 50-75 | |
| | 3.2 | 350 | 80-110 | |
| | 4.0 | 350 | 100-145 | |
| | 5.0 | 450 | 140-180 | |

For welding of root runs either GTAW with CN 22/9 N-IG or SMAW with FOX CN 22/9 N is applicable. Preheating and interpass temperature max. $+150^{\circ}\text{C}$. In case of solution annealing e.g. cast iron, an interpass temperature of 250°C is acceptable. Heat input according to wall thickness.

Base Materials

same-alloyed duplex steels, as well as similar-alloyed, ferritic-austenitic steels with higher tensile strength 1.4462 X2CrNiMoN22-5-3, 1.4362 X2CrNiN23-4, 1.4462 X2CrNiMoN22-5-3 together with 1.4583 X10CrNiMoNb18-12, 1.4462 X2CrNiMoN22-5-3 with P235GH/ P265GH, S255N, P295GH, S355N, 16Mo3 UNS S31803, S32205

Approvals and Certificates

TÜV-D (7084.), CE

Same Alloy Filler Metals

| | | | |
|------------------|---------------|------------------|---------------------|
| SMAW electrode: | FOX CN 22/9 N | Flux cored wire: | CN 22/9 N-FD |
| GTAW rod: | CN 22/9 N-IG | | CN 22/9 PW-FD |
| GMAW solid wire: | CN 22/9 N-IG | SAW combination: | CN 22/9 N-UP/BB 202 |