



# Product Data Sheet

Shield-Bright 2209

T 'Tubular cored electrode arc welding'

|             |               |             |          |            |            |       |
|-------------|---------------|-------------|----------|------------|------------|-------|
| Prepared by | Qualified by  | Approved by | Reg no   | Cancelling | Reg date   | Page  |
| Neil Farrow | P-O Oskarsson | Neil Farrow | EN010705 | EN010301   | 2023-06-08 | 1 (2) |

## REASON FOR ISSUE

UKCA approval added.

## GENERAL

Shield-Bright 2209 is an all-position duplex flux cored electrode for use with 100% CO<sub>2</sub> or 75~85%Ar / 20~25% CO<sub>2</sub> mixed gas. It is designed for the welding of 22Cr-5Ni-2Mo-0.15N duplex stainless steel(UNS S31803), commonly known as 2205. Commercial designations for such steels include SAF 2205(Sandvik), 2205(Avesta), UR 54N(Creusot), AF22(Mannesmann), NK Cr22(Nippon Kokan), SM22Cr(Sumitomo).

**Shielding Gas:** M21, C1 (EN ISO 14175) **Alloy Type:** Ni, Cr, Mo, N

**Polarity:** DC+

**Fill Type:** Rutile

## CLASSIFICATIONS Weld Metal

|                |                      |
|----------------|----------------------|
| SFA/AWS A5.22  | E2209T1-4, E2209T1-1 |
| EN ISO 17633-A | T 22 9 3 N L P C1 2  |
| EN ISO 17633-A | T 22 9 3 N L P M21 2 |

## APPROVALS

|        |                  |
|--------|------------------|
| ABS    | E2209T1-1        |
| ABS    | E2209T1-4        |
| BV     | 2205 (C1)        |
| BV     | SA 2205          |
| CCS    | 2205S            |
| CE     | EN 13479         |
| CWB    | E2209T1-1 (M21)  |
| CWB    | E2209T1-4 (C1)   |
| DNV    | Duplex           |
| DNV-GL | Duplex (C1, M21) |
| LR     | S31803           |
| UKCA   | EN 13479         |
| VdTÜV  | 09123            |

## CHEMICAL COMPOSITION

### All Weld Metal (%)

|                            | C1   |                            | M21  |       |
|----------------------------|------|----------------------------|------|-------|
|                            | Min  | Max                        | Min  | Max   |
| C                          |      | 0.04                       |      | 0.04  |
| Si                         |      | 1.0                        |      | 1.0   |
| Mn                         | 0.50 | 2.0                        | 0.50 | 2.0   |
| P                          |      | 0.030                      |      | 0.030 |
| S                          |      | 0.025                      |      | 0.025 |
| Cr                         | 21.0 | 24.0                       | 21.0 | 24.0  |
| Ni                         | 7.5  | 10.0                       | 7.5  | 10.0  |
| Mo                         | 2.5  | 4.0                        | 2.5  | 4.0   |
| Cu                         |      | 0.5                        |      | 0.5   |
| N                          | 0.08 | 0.20                       | 0.08 | 0.20  |
| Ferrite FN                 | 35   | 55                         | 35   | 55    |
| Comments:                  |      | Comments:                  |      |       |
| PREN(1) Min-35.0, Typ-36.2 |      | PREN(1) Min-35.0, Typ-36.5 |      |       |
| (1) PREN = Cr+3.3Mo + 16N  |      | (1) PREN = Cr+3.3Mo+16N    |      |       |



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| Neil Farrow | P-O Oskarsson | Neil Farrow | EN010705 | EN010301   | 2023-06-08 | 2 (2) |

## MECHANICAL PROPERTIES OF WELD METAL

### All Weld Metal

| Shielding Gas | Condition | Rp0.2 [MPa/ksi] |        | Rm [MPa/ksi] |     |         | A4 [%] |     |
|---------------|-----------|-----------------|--------|--------------|-----|---------|--------|-----|
|               |           | Min             | Typ    | Min          | Max | Typ     | Min    | Typ |
| M21           | As welded | 500/73          | 670/97 | 700/102      |     | 810/117 | 25     | 28  |
| C1            | As welded | 500/73          | 650/94 | 700/102      |     | 800/116 | 25     | 28  |

Comments:

| Shielding Gas | Condition | Temp [°C/°F] | Charpy V [J/ft-lb] |       |
|---------------|-----------|--------------|--------------------|-------|
|               |           |              | Min                | Typ   |
| M21           | As welded | -40/-40      | 32/24              | 42/31 |
| C1            | As welded | -40/-40      | 32/24              | 40/30 |

Comments:

## ECONOMICS & CURRENT DATA

| Dimension          | Current (A) |     | W  | $\eta$ | N | H                   |                      |     | Feed                   |                         |     | U   |     |     |
|--------------------|-------------|-----|----|--------|---|---------------------|----------------------|-----|------------------------|-------------------------|-----|-----|-----|-----|
|                    | Min         | Max |    |        |   | Min                 | Max                  | Nom | Min                    | Max                     | Nom | Min | Max | Nom |
| 1.2 mm (0.045 in.) | 130         | 220 | 20 | 84     |   | 1.9 kg/h (4.2 lb/h) | 4.6 kg/h (10.1 lb/h) |     | 5.8 m/min (228 in/min) | 14.4 m/min (567 in/min) |     | 25  | 30  |     |
| 1.6 mm (1/16 in.)  | 170         | 300 | 20 | 83     |   | 2.4 kg/h (5.3 lb/h) | 5.2 kg/h (11.5 lb/h) |     | 3.9 m/min (154 in/min) | 8.2 m/min (323 in/min)  |     | 25  | 29  |     |

**W** = Gas consumption (l/min)

**$\eta$**  = Filler metal efficiency (g weld metal x 100 / g wire)(%)

**N** = Deposition efficiency (g weld metal x 100 / g electrode)(%)

**H** = Deposition rate (kg weld metal/hour arc time)

**Feed** = Wire feed speed (m/min)

**U** = Arc voltage (V)