



Certificate for Welding Consumable TG-S2CW/Ar

Project: **Supplementary List of Certified Welding Consumables**

Client: **Kobe Steel, Ltd.
Fukuchiyama Plant**

Office: **Yokohama**

Clients Order Number: -

Date: **11 April 2023**

Order Status: **Completed**

Inspection Dates

First: **27 January 2023**

Final: **28 March 2023**

This certificate is issued to the above Client to certify that the undersigned Surveyor to this Society did at their request attend their Fukuchiyama Plant and Fujisawa Plant on and between the dates shown above for the purpose of examining and testing below noted welding consumable.

Trade Name: **TG-S2CW/Ar**
Welding Process: **Solid Wire/Gas Shield (GTAW)**
Welding Position: **DXVuO**
Joint Type: **BF**
Specification: **TG-S2CW/Ar [M – Manufacturer's specification]**

A weld metal assembly was prepared using the welding consumable of lot number GZ80755, and specimens machined from the assembly according to the specification were tested using calibrated measuring and testing equipment in the presence of the undersigned with results satisfying the requirements of the specification as follows.

Stress Relief Condition 1

Mechanical Properties of Deposit Metal

| | Dia. [mm] | Re [N/mm ²] | Rm [N/mm ²] | A [%] | CVN Impact [J] | Test Temp. | Stress Relief |
|-----------------|------------|-------------------------|-------------------------|-------|----------------|------------|---------------|
| Spec. | 0.8 to 3.2 | ≥ 530 | ≥ 620 | ≥ 16 | - | - | 715°C x 2hrs |
| Obtained | 2.4 | 630 | 721 | 20 | - | - | 715°C x 2hrs |

Chemical Analysis of Deposit Metal [WT %]

| | C | Si | Mn | P | S | Ni | Cr | Mo | Cu |
|-----------------|----------|----------|-----------|-----------|-----------|----|-----------|-----------|----|
| Spec. | 0.15 max | 0.60 max | 0.10-1.60 | 0.020 max | 0.010 max | - | 1.90-2.60 | 0.05-0.85 | - |
| Obtained | 0.05 | 0.41 | 0.48 | 0.004 | 0.006 | - | 2.19 | 0.47 | - |

Stress Relief Condition 2

Mechanical Properties of Deposit Metal

| | Dia. [mm] | Re [N/mm ²] | Rm [N/mm ²] | A [%] | CVN Impact [J] | Test Temp. | Stress Relief |
|-----------------|------------|-------------------------|-------------------------|-------|----------------|------------|---------------|
| Spec. | 0.8 to 3.2 | ≥ 400 | ≥ 510 | ≥ 17 | - | - | 715°C x 1hr |
| Obtained | 2.4 | 652 | 741 | 19 | - | - | 715°C x 1hr |

Chemical Analysis of Deposit Metal [WT %]

| | C | Si | Mn | P | S | Ni | Cr | Mo | Cu |
|-----------------|----------|----------|-----------|-----------|-----------|----|-----------|-----------|----|
| Spec. | 0.15 max | 0.60 max | 0.10-1.60 | 0.020 max | 0.010 max | - | 1.90-2.60 | 0.05-0.85 | - |
| Obtained | 0.05 | 0.41 | 0.47 | 0.004 | 0.006 | - | 2.20 | 0.47 | - |

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The works of the manufacturer was inspected and found in satisfactory order. The process of manufacture, including supervision, quality control and record keeping were of adequate standard and storage condition and facilities were found to be satisfactory as well.



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