

Code UIC

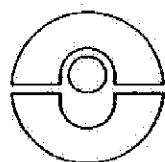
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**NUMERISATION DANS
L'ETAT DU DOCUMENT**

Technical specification
for determining the nominal output
and coefficient of deposition
of cored wire electrodes
for automatic and semi-automatic
gas-shielded welding
of plain carbon or low alloy steels



International Union of Railways

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Leaflet to be classified in Volumes :

- V - Transport stock
- VI - Traction
- VIII - Technical specifications

Amendments

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This leaflet is :

- *obligatory* for all technical documents produced in connection with UIC and ORE,
- *recommendatory* for the technical documents of the Member Railways of the Union.

Note

This leaflet is part of a set which also includes :

Leaflets in Sub-section 89 (897) : Welding.

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1 - Subject

This technical specification governs the method for determining the nominal output and coefficient of deposition of cored wire electrodes for automatic and semi-automatic gas-shielded welding of plain carbon or low alloy steels used for the construction and repair of rolling stock.

2 - Definition of terms**2.1 - Nominal output**

The nominal output R_N is the ratio of the mass of weld metal applied in standard conditions to the mass of wire used.

2.2 - Coefficient of deposition

The coefficient of deposition D of a cored wire electrode is the mass of weld metal per ampere and per minute deposited in standard conditions.

3 - Specimens**3.1 - Design**

The specimen must consist of carbon steel (up to 0.25 % C).

The specimen consists of a 300 x 75 mm parallelepipedic steel plate with a thickness of :

- 15 mm in the case of cored wire electrodes with a diameter of 2.8 mm or less,
- 20mm in the case of cored wire electrodes with a diameter of more than 2.8 mm.

The surface of the plate, to which the deposit is to be applied, must be cleaned, if necessary by light grinding or other suitable means, so that it is free from scale, rust, paint, oil, etc. After cleaning and before deposition, the specimen must be weighed to an accuracy within $\pm 1g$.

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3.2 - Preparation

The specimens are prepared by depositing the metal of the cored wire electrode to be tested with a semi-automatic or an automated semi-automatic welding machine with suitable properties ; weld beads are deposited side by side on the plate until a mass of $250 \pm 25 g$ of cored wire electrode has been used.

After each run, the specimen may be cooled with water, but in this case the specimen should be dried, before welding is continued. Welding slag and spatter adhering to the specimen must be removed carefully, before the next weld bead is deposited.

The temperature difference between two runs must not exceed 100°C.

The welding parameters must conform with the specifications of UIC leaflet No. 897-6 ("Technical specification for the acceptance of combinations of wire electrodes (solid or cored) and gases and also for the supply of wire electrodes (solid or cored) for automatic and semi-automatic gas-shielded welding of plain carbon or low alloy steels").

The time required for the deposition of each bead, during which the light arc is ignited, must be measured to an accuracy of 0.2 s and the overall time t is calculated in minutes. The welding current, expressed in amperes is measured to an accuracy of 10 A.

After welding, the specimen must be allowed to cool to room temperature and, after removal of slag and spatter (and, also, after drying, if water cooling was applied) weighed again to an accuracy of $\pm 1g$.

4 - Specification of the nominal output and the coefficient of deposition**4.1 - Nominal output**

Rounded down values : 70 - 75 - 80 - 85 - 90 - 95.

Examples :

Symbol 80 when $80 \leq R_N < 85$.

Symbol 85 when $85 \leq R_N < 90$.

4.2 - Coefficient of deposition

The values measured must be given to two decimal places.

5 - Testing

5.1 - Nature and extent of the tests

The cored wire electrodes are submitted to the following tests :

- Determination of the nominal output
- Determination of the coefficient of deposition

One specimen must be prepared for each cored wire electrode diameter to be tested.

5.2 - Implementation

The performance of the tests must comply with the regulations of this technical specification

- The nominal output is calculated with the following formula :

$$R_N\% = \frac{m_D}{m_F} \times 100$$

where m_D is the mass of the welding metal,
 m_F is the mass of the wire electrode used up.

- The coefficient of deposition is calculated with the following formula :

$$D = \frac{m_D}{I_m \times t}$$

where m_D is the mass of the welding metal in grams,
 I_m is the welding current in amperes,
 t is the total light arc duration in minutes.

Application

As from 1 January 1988.

All railways in the Union .

Record references

Heading under which the question has been examined :

- *Question 5/SA/FIC - Approval of revised Leaflet 897-8. (Traction and Rolling Stock Committee, Budapest, June 1987).*