INSTRUCTION MANUAL
Welded swivel lifting rings

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PRODUCT DESCRIPTION
This instruction manual refers to the welded swivel lifting rings designed for safety purposes by CODIPROLUX. All the rings are listed and described in the current technical catalogue. Only CODIPROLUX's official technical catalogue may be used for reference purposes.

QUALITY CERTIFICATION
Complies with Machinery Directive 2006/42/EC. Complies with Standard EN 1677-1. Delivered with conformity certificate. Anti-crack inspection on all parts. Test load testing (WLL x 2.5) according to current European standards. Safety coefficient 5 on most products (see current technical standard). Possible receipt by an external inspection body.

MAXIMUM TRACEABILITY GUARANTEED
Individual tracking of each ring using a unique code. Manufacturing mark on each component of the ring.

CONDITIONS OF USE
Only by competent and trained personnel in accordance with the standards in force where the equipment is used. Do not pass under a suspended load and/or expose personnel in the handling area. Avoid any dangerous manoeuvres during handling: shocks, jolts, vibrations, etc. Strictly follow the WLL engraved on the ring. The size of all lifting accessories that come into contact with the rings must be suitable in relation to the latter and comply with current standards. Material designed for an operating temperature between -20°C and +200°C.
Avoid use in corrosive, aggressive and/or sandy, chemical, acid, steamy, etc. environments. The use of swivel lifting rings with an angle causes a WLL reducing coefficients. Refer to the table with the lifting angles in our technical catalogue to calculate these coefficients.

For any lifting not shown in this lifting angles table, please contact the manufacturer.

ASSEMBLY
All adjustable parts must be able to remain moving in all directions with no obstacles hindering their movement. Consider the centre of gravity. Whenever carrying out any lifting operations, first make sure the shackle is positioned in the direction of traction.

WELDING

1. General information
This procedure only applies to the assembly of Codipro swivel rings using TIG and MAG processes or electrode-coating with basic coating. The swivel lifting ring part aimed to be welded is made up of steel 25CrMo4 whose chemical composition can be found on table 2. The weldability of the piece and the operating conditions must be assessed.
The recommended filler materials are reported in table 1. The specified operating conditions are only valid for filler materials with a diffusible hydrogen content less than or equal to 5 ml/100 g of deposited metal. These recommendations are only valid if the weldability of the support piece on which the ring will be welded is less restrictive. Otherwise, a specific evaluation of the operating conditions is required. The ring must be welded onto a flat surface.

2. Personnel qualification
Welding must be performed by personnel with a valid qualification in accordance with EN 287-1 and whose range of validity covers this application. For the domain of validity, see EN 287-1.

3. Selection of the filer material
There are three welding processes: TIG, MAG and electrode-coated. The filler material must ensure a diffusible hydrogen content below or equal to 5 ml/100 g of deposited metal. Otherwise, the operating conditions will need to be reconsidered. In the case of welding with coated electrodes, only basic coatings are permitted. Moreover, follow the stoving and storage conditions recommended by the manufacturer. Use G3Si1 filler materials for MAG welding or an equivalent type for other processes. Examples of names of filler materials are reported in table 1.

Table 1

Welding process	European name	US name	Protective gas	Supply example
MAG / GMAW	ISO 14341 G3Si1	AWS A 5.18 – ER 70 S-6	M21	LNM 26 (GMAW)
TIG / GTAW	ISO 636 W3QI1	AWS A 5.18 – ER 70 S-G	I1	LNM (GTAW)
Coated electrode / SMAW	E 38 X*[1] B 12 H5 E 42 X* B 12 H5	AWS A 5.1 E 7016 ou E 7018	--	Baso 100

[1] * Representative of the resilience guarantee. To be selected according to the application

4. Preparation before welding

The areas to be welded and surrounding areas should be prepared with a grinding wheel for grinding or deburring by making sure you do not create notches in the material, which could lead to an additional lack of fusion.
Before starting with welding operations, the welding areas and surrounding areas must be thoroughly degreased with a non-greasy solvent that does not leave any residues (e.g. acetone). Degreasing should be carried out with white, clean, dry and lint-free cloths. To check the quality of the cleaning, the cloth must remain white at the end of the degreasing process.
If necessary, the ring can be pointed on the support. Previous recommendations regarding the welding energy and preheating should also be applied. Make round marks that are at least 20-25 mm long to avoid cracks from appearing when surfaces cool down.

5. Welding

The minimum energy required to carry out these assembly steps must be1 kJ /mm regardless of the method chosen. The energy should be adapted to the method, the filler material and the welding position.
The minimum groove heights to perform in terms of lifting capacities are:

WEDSR 2: 5 mm
WEDSR 5: 6 mm
WEDSS 10: 7 mm

Given the volume of grooves to be deposited, the deposits will be made in at least three coats. Degreasing should be performed between each coat. Each coat should be carried out continuously, without resuming it, with management of ignition and arc extinction.

To reduce the risk of cold cracking, preheat the ring and possibly the support (the weldability of this element should be assessed in relation to Equivalent Carbon and thickness). For the WEDSR 2 and WEDSR 5 rings, this preheating stage must be 100°C ±5°C and 120°C ±5°C for WEDSS10 rings. Maintain an interpass temperature equivalent to preheating. After welding, the geometry of the weld should not have notches or lateral buckling of the bead to prevent cracking due to fatigue.

Ultrasonic inspection, dye penetrant inspection or magnetic particle testing is recommended 48 hours after soldering

CHECKS AND MAINTENANCE

The check must be performed by competent and trained personnel in accordance with the standards in force where the equipment is used. A visual inspection is required beforehand whenever the equipment is used. Always check the following:

- Articulation of moving parts,
- Unusual wear and/or corrosion,
- Deformation,
- CE marking, traceability and WLL engraving.

If one of these criteria is considered non-compliant, the ring must undergo further examination. A thorough inspection must be conducted every year. In special cases, more frequent thorough checks are required (refer to current legislation).

Table 2 – Chemical composition (mass percentage)

Elements	Ni	Cr	Mo	S	P
Composition	≥ 0,40	≥ 0,40	≥ 0,15	≤ 0,01	≤ 0,01

Translation of the original instructions. Complies with Machinery Directive 2006/42/EC