

MAGNA 402 AC-DC

An electrode which is austenitic in structure and non-cracking, which rapidly work hardens to great depth and resists extreme shock and impact. It has the following features:

- 1. High Restitution Co-efficient.** Will take extreme impact. Has a controlled combination of high yield strength, high resilience, high compressive strength and high work hardening ability. The work hardening of ordinary manganese steel is, for comparison, approximately 3 mm thick. Magna 402 can work harden to a much greater depth when used in severe conditions. Magna 402 retains a tough ductile core with a super hard outer shell. This enables great impact resistance without cracking.
- 2. High Crack Resistance.** The ordinary manganese steel, nickel manganese steel and molymanganese steel electrodes tend to crack under a variety of conditions, such as those following:-
 1. When welded in cold weather.
 2. On re-welding when more weld metal is deposited over previously deposited metal.
 3. When making large build ups.
 4. When joining cracks or bevels.

The reason ordinary manganese steel electrodes crack is because of 6 specific causes:

1. Some ordinary manganese steel electrodes contain a high percentage of phosphorous. Magna 402 has a careful control that keeps the phosphorous level to the very minimum.
2. Some are either not stabilized or inadequately stabilized. These type of manganese steel electrodes will become embrittled when a second pass is applied over the first pass because the welding heat causes transformation of the metastable austenite to bainite and the grain boundaries thicken and cracking follows. Magna 402 has additives and stabilizers which prevent transformation.

3. Some manganese steel electrodes have low yield strength. Magna 402 has a high yield strength.
4. Often manganese steel electrodes flow rapidly and slipping occurs on one or more planes with each crystal. Interdendritic areas of segregation occur and cracking follows. The stabilizers in Magna 402 prevent this condition.
5. Magna 402 contains 50% more manganese than ordinary manganese steel along with other high alloys. Magna 402 can be used to join manganese steel to mild steel.
6. Magna 402 can be cut readily with an oxyacetylene torch.

3. Physical Properties of Magna 402.

Hardness before cold working: 187 Brinell Hardness (BHN).

Work hardens to approximately 473 Brinell Hardness (BHN).

Wet quartz resistance when work hardened: 1100 times better than SAE 1020 steel.

Tensile strength: Before cold working approximately 120,000 p.s.i.
(84 kg/mm²)

Elongation: 47%

Completely immune to hydrogen contamination.

MAGNA APPLICATION PROCEDURE - MAGNA 402

Prepare weld area by grinding or chipping away fatigued metal. May be applied over previous weld deposits.

AC or DC reverse polarity welding machines may be used. Manganese steel applications require lowest possible amperage.

Preheating is only required in instances of extremely cold outdoor temperatures.

Magna 402 can be applied using either stringer bead or weave techniques.

Where large build up of deposits are required, peening between passes is advisable.

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On Cast Iron applications apply an initial coating of Magna 770 over entire area.

Special Note:

Welds of Magna 402 are machinable, however, due to its extremely high work hardening characteristics, machining is best effected by decreasing the cutting speed and rate of feed.

Recommended Amperages:

Metric	Inches	Gauge	Setting
4.0 mm	5/32	8	130 - 180 amps