AR450

Wear Resistant Steel

TECHNICAL SHEET

1 Chemical Composition

Plate Thickness	C	Si	Mn	P	S	Cr	Ni	Mo	B	Supply Hardness(HB)	Supply Condition
3mm - 60mm	0.20-0.23	0.60	1.40-1.60	0.025	0.010	0.20-1.30	0.10-0.50	0.25-0.50	0.005	450BHN	Q & T

2 Other mechanical properties (typical values)

Charpy-V notch impact test (Longitudinal at -40°C)	Yield Strength (MPa)	Tensile Strength Transverse (MPa)	Elongation A5 (%)
35 J	1250	1400	10

3 Main Characteristics and Applications

AR450 is a martensitic steel known for its exceptional abrasion resistance and impact toughness. With an average Brinell hardness of 450, it offers outstanding protection against wear and tear, extending its service life significantly. Its excellent cold forming properties and weldability make AR450 an ideal choice for a wide range of wear-intensive applications.

Applications:

- On Road Tipper and Dumper Bodies
- Cement Drum Mixer Barrels
- Refuse Haulers and Scrap Containers
- Buckets and Knives
- Feeders, Skips and Screw Conveyors
- Mining and Earthmoving Machinery

4 Heat Treatment

AR450 achieves its desired properties through a process of quenching and when necessary tempering. However, these properties are not stable at service or preheating temperatures above 250°C. As a result, AR450 is not designed for any additional heat treatment after delivery.

5 General Processing Recommendations

To maximize productivity when working with AR450, it's crucial to follow the specific procedures and use the recommended tools outlined below.

Thermal Cutting

Plasma and flame cutting can be performed on AR450 without preheating for thicknesses up to 40 mm when the ambient temperature is above 0°C. After cutting, allow the parts to cool slowly to room temperature. This will minimize the risk of cut edge cracking. Avoid any actions that could speed up the cooling process.

Cold Forming

AR450 is highly suitable for cold forming operations. The minimum recommended radius-to-thickness ratio (R/t) for bending AR450 is provided in the table below.

Thickness (mm)	Transverse to rolling (R/t)	Longitudinal to rolling (R/t)	Trans. Width (W/t)	Long. Width (W/t)
t <8.0	3.5	4.0	10	10
8 ≤ t < 20	4.0	5.0	10	12
t ≥ 20.0	5.0	6.0	12	14

R = Recommended punch radius (mm), t = Plate thickness (mm), W = Die opening width (mm) (bending angle ≤ 90°)

AR450's consistent properties and precise thickness control help minimize springback during forming. To further reduce the risk of cracking during bending, it's recommended to grind any flame-cut or sheared edges in the bending area.

Welding

AR450 is highly weldable due to its low carbon equivalent. It can be welded using various conventional methods, both manual and automatic. Welding should be performed at ambient temperatures above +5°C. After welding, allow the parts to cool slowly to room temperature. Avoid accelerating the cooling process.

For single plate thicknesses up to 20 mm, preheating is not required when using a heat input of 1.7 kJ/mm. The interpass temperature should not exceed 225°C. Use soft weld consumables that produce low-hydrogen weld deposits (<= 5 ml/100g). The consumable strength should be as soft as the design and wear requirements permit.

Welding recommendations for AR450 should generally follow EN-1011.

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SandeepEnterprises STEEL SOLUTIONS

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Machining

AR450 is moderately machinable using HSS and HSS-Co alloyed drills. However, due to its high hardness, it's necessary to adjust the feed rate and cutting speed accordingly.

For operations like face milling, counter boring and countersinking tools with replaceable cemented carbide inserts are the most effective choice.

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