

Introduction

The steel industry is the backbone of modern infrastructure, producing materials used in construction, transportation, and manufacturing. This industry relies on heavy-duty machinery and equipment that undergoes extreme conditions such as high temperatures, pressure, and abrasion. Welding electrodes play a critical role in the fabrication, repair, and maintenance of steel industry equipment, ensuring operational efficiency and minimizing downtime.

Applications of Welding Electrodes in Steel Industry

Application	Details	Examples of Electrodes
Roller Repair	Hardfacing worn-out rollers used in steel rolling mills to restore their original dimensions.	Hardfacing electrodes
Furnace Repairs	Welding high-temperature components like furnace shells and refractory anchors.	Heat-resistant stainless steel electrodes
Conveyor System Maintenance	Joining and repairing conveyor belts, rollers, and frames.	Low-hydrogen electrodes (e.g., E7018)
Structural Repairs	Fabricating and repairing steel structures such as beams, supports, and platforms.	General-purpose electrodes (e.g., E6013)
Pipe Welding	Joining and repairing pipelines for water, gas, or molten metal transport.	Stainless steel electrodes (e.g., E316)
Cranes and Hoists	Strengthening and repairing load-bearing components used in material handling.	Low-hydrogen or high-strength electrodes
Overlay Welding	Depositing wear-resistant layers on abrasion-prone components such as hoppers and chutes.	Hardfacing electrodes
Joining Dissimilar Metals	Welding steel to other metals like cast iron or stainless steel in specific applications.	Nickel-based or stainless steel electrodes

Usage of "MAXIDURA" in various APPLICATIONS of STEEL INDUSTRIES

STEEL INDUSTRIES			
COMPONENTS	BASE METALS	WEAR FACTORS	RECOMMENDED ELECTRODES
GEAR	CAST STEEL	ABRASION/FRICTION	MaxiDura102
PINION OF SINTERM/C	FORGED STEEL	ABRASION/FRICTION	MaxiDura104
HAMMER MILL ROTOR	FORGEDSTEEL	ABRASION	MaxiDura104
COOLER FAN BLADE	CASTSTEEL	ABRASION/FRICTION	MaxiDura102
BLOWER FAN BLADE & HUB(IMPELLER)	SPECIALALLOY	ABRASION/FRICTION	MaxiDura101+100
RAIL	MN.STEEL	ABRASION/IMPACT	MaxiDura108
SUPPORT ROLLS	CAST STEEL	FRICTION	MaxiDura102
FRICTION WHEEL	FORGED	ABRASION/FRICTION	MaxiDura104

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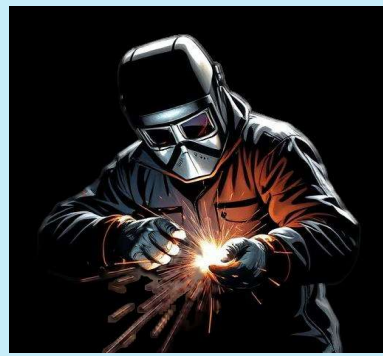
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Email:-shribalajialloyscorporation@gmail.com

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COKE OVEN				
AIR COMPRESSOR BODY	CAST IRON	ACCIDENT	MaxiDura	114/115
MOTOR BASE PLATE	CAST IRON	ACCIDENT	MAxiDura	114/115
PUMP BODY	CAST IRON	ACCIDENT	MaxiDura	114/115
CHUTE	STAINLESSSTEEL	ABRASION	MaxiDura	SP+107
FLANGE	STAINLESSSTEEL	ABRASION	MaxiDura	SP+107
SHAFT	STAINLESSSTEEL	ABRASION	MaxiDura	SP+107
GEARS	CAST IRON	FRICITION	MaxiDura	114/115
DOG CLUTCH	CASTSTEEL	FRICITION	MaxiDura	102
GEAR BOX	CAST IRON	ACCIDENT	MaxiDura	114/115
CONVEYOR DRUMS	CASTSTEEL	FRICITION	MaxiDura	102
CRUSHER JAWS HAMMER	MN.STEEL	IMPACT/ABRASION	MaxiDura	108
PULLEYS	CAST IRON	FRICITION	MaxiDura	114/115
BUCKETS	MN.STEEL	IMPACT/ABRASION	MaxiDura	108
GEAR WHEEL	CASTSTEEL	FRICITION	MaxiDura	102
MOTOR CASINGS	CAST IRON	ACCIDENT	MaxiDura	114/115SPL
TRANMISSIONGEAR	CAST IRON	FRICITION	MaxiDura	114/115
BUSH BARS	COPPER	FRICITION	MaxiDura	130
LIFTING BLOCKS	CAST IRON	ACCIDENT	MaxiDura	114+115SPL
CHAINS	CASTSTEEL	FRICITION	MaxiDura	102
LEADER TIPS	ALLOYSTEEL	FRICITION	MaxiDura	110
CHASSIS	CASTSTEEL	CRACK	MaxiDura	102
HYDRAULIC UNITS	BRASS/BRONZE	FRICITION	MaxiDura	130
WASHERY MAIN	CAST IRON	ACCIDENT	MaxiDura	114+115
COKE CRUSHING HAMMER	CAST STEEL	IMPACT	MaxiDura	102
PINION FORPUSHER RACK	MN.STEEL	ABRASION/IMPACT	MaxiDura	108
COUPLING FLANGER	CAST STEEL	FRICITION	MaxiDura	102
RAMBEANS OF SUPPORT	CASTSTEEL	VIBRATION	MaxiDura	102
COOLING MEMBERS	COPPER	JOINING	MaxiDura	130
SINTER BREAKER	CAST STEEL	ABRASION/IMP ACT	MaxiDura	102
HAMMERS	CAST STEEL	ABRASION/IMP ACT	MaxiDura	102
PALLETS	CAST STEEL	CRACK	MaxiDura	102
PALLETS	CAST IRON	CRACK	MaxiDura	115SPL/115
SHAFTS	STAINLESS	JOINING/SURF	MaxiDura	SP
CRUSHER JAWSHAMMER	MN.STEEL	ABRASION/IMPACT	MaxiDura	108/105

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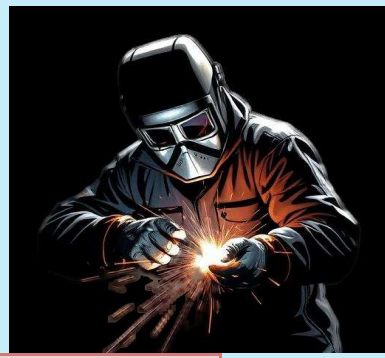
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VALVES	CAST IRON	ABRASION/SUR FACING	MaxiDura	114/115
THROAT ARMOUR PLATES	CAST STEEL	ABRASION/ERO SION	MaxiDura	102

STEEL MELTINGSHOP			
FURNACE DOORS	CAST STEEL	JOINING	MaxiDura115
PUMP SHAFTS	EN STEEL	JOINING/SURFACING	MaxiDuraSP
PULLEY	CAST IRON	BROKEN/BUILDUP	MaxiDura115/115SPL
KILNSHELL	CAST STEEL	JOINING	MaxiDura114
LADLE TRUNION	CAST STEEL	ABRASION	MaxiDura102
CRANE RAILS	CAST STEEL	ABRASION	MaxiDura102
ROLLERS	CAST IRON	BROKEN/JOINING	MaxiDura114/115
VALVES	STAINLESSSTEEL	EROSION	MaxiDura139
OXYGENLANCER	COPPER	EROSION	MaxiDura130

FOUNDRY			
CRANE BEARINGPEDESTRAL	CAST STEEL	FRICTION	MaxiDura102
SAND PUMP	CAST IRON	ABRASION	MaxiDura115 SPL
IMPELLERCASING	CAST IRON	ABRASION	MaxiDura115 SPL
MIX ULLERPLOUGH	MN.STEEEL	ABRASION	MaxiDura108
IMPELLERBACKPLATE	CAST IRON	FRICTION	MaxiDura115 SPL

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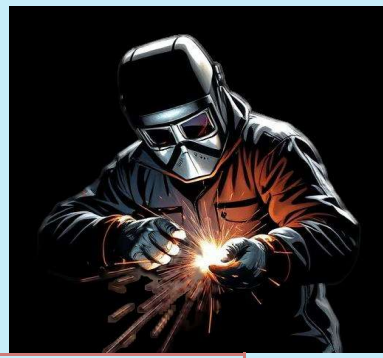
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VALVE SPINDLE OF MAX M3	BRASS	FRICTION	MaxiDura 130
ELEVATORSHAFT	STEEL	FRICTION	MaxiDura SP
FEED SCREW	CAST STEEL	ABRASION	MaxiDura102
VIBRATOR TABLE	CAST IRON	CRACK	MaxiDura114/115
MOULDING BOX	CAST IRON	CRACK	MaxiDura114/115
FEEDER HEAD	STEEL	ABRASION	MaxiDura103
ROLLERS	STEEL	FRICTION	MaxiDuraSP
MOULD DRILL	H.S.S	FRICTION	MaxiDura119
MOULD KNIFE	H.S.S	FRICTION	MaxiDura119
FAN BLADE	STEEL	ABRASION	MaxiDura103
HEAT TREATMENT GRILL	STAINLESS STEEL	HEAT	MAxiDura107+123
HEATING ELEMENTS	NICHROME	HEAT	MaxiDura140
MACHINE BASE	CAST IRON		MaxiDura114/115
MACHINE HOUSING ENGINE BLOCKS	CAST IRON		MaxiDura114/115
SAND DISCHARGE CHUTE	MILD STEEL	ABRASION	MaxiDura103
PUMP SHAFT	STEEL	FRICTION	MaxiDuraSP
MNS.LINER MOULD	MN.STEEL	IMPACT/ABRASION	MaxiDura108
SCRAP BLADES	MN.STEEL	ABRASION	MaxiDura108+103
MIXER PADDLES	MN.STEEL	ABRASION	MaxiDura108
TACKLE INGOT MOULD	CAST IRON	CAVITATION/H EAT	MaxiDura114/115SPL

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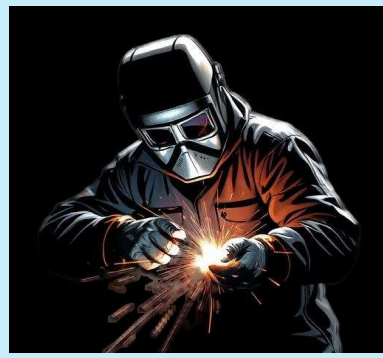
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MILL			
IDLERS	CAST IRON	FRICTION	MaxiDura115
IDLERS	STEEL	FRICTION	MaxiDuraSP
ROLLERS	CAST IRON	FRICTION	MaxiDura114/SPI115
ROLLERS	STEEL	FRICTION	MaxiDuraSP
HOUSING	CAST IRON	CRACK/JOINING	MaxiDura114/115
HOUSING	CAST IRON	CRACK/JOINING	MaxiDura114/115
CRANE RAILS	MN.STEEL	FRICTION/ABRA SION	MaxiDura108
CRANE WHEELS	FORGEDSTEEL	FRICTION/ABRASION	MaxiDura104
IMP ELLERS	BRONZE C.IRON	ABRASION	MaxiDura130+114
MAI BOR N STAND ES	CAST STEEL	FRICTION	MaxiDura102
FLY HOUSING ING SHEAR	CAST STEEL	FRICTION	MaxiDura102
HOT SHEAR BLADE	HCHCR	IMPACT/FRICT ION	MaxiDuraSP
HOT WORKING TOOLS	HCHCR	FRICTION	MaxiDuraSP
WIRE CUTTERS	HSS	FRICTION	MaxiDura119

REFRACTORIES			
SUPPORTING ROLLS OF ROTARY KILN	LOW ALLOY STEEL	ABRASION/FRI CTION	MaxiDura119+105
IMPACT CRUSHER	LOW ALLOY STEEL	FRICTION/IMP ACT	MaxiDura119+105
ROTTERS	MN.STEEL	ABRASION	MaxiDura108
CROWN GEARS	CAST STEEL	FRICTION	MaxiDura102

ELECTRICAL			
FAN COVER OF MOTORS	CAST IRON	FRICTION/ACC IDENT	MaxiDura114/115
MOTOR FOUNDATION	CAST IRON	ACCIDENT	MaxiDura114/115
ARMATURE SHAFT	STEEL	FRICTION	MaxiDura
BEARINGSEATING	CAST STEEL	FRICTION	MaxiDura 102
HOUSING	CAST IRON	FRICTION	MaxiDura 115
COPPER BUSHES	COPPER	FRICTION	MaxiDura 130

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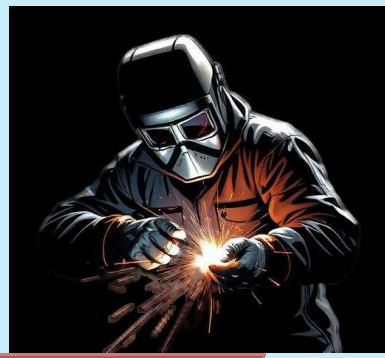
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CRANE WHEEL			
MACHINE BEDS HOUSING	CAST IRON	JOINING	MaxiDura114/115 SPL
CRANE WHEEL	CAST STEEL	ABRASION	MaxiDura102
HOUSING	CAST STEEL	ABRASION	MaxiDura102
WHEEL PUNCH	CAST STEEL	ABRASION	MaxiDura102
SHEAR BLADES	ALLOY STEEL	IMPACT/HEAT	MaxiDura110
PUNCH& DIE FOR SLEEPER	ALLOY STEEL	IMPACT /HEAT	MaxiDura110
HAMMER PALLETS	MN.STEEL	IMPACT	MaxiDura108
WEIGHING PLATES	CARBON STEEL	ABRASION	MaxiDura101+100
SPINDLE	CARBON STEEL	FRICION	MaxiDura101

Key Considerations for Electrode Selection

Consideration	Details
Material Compatibility	Ensure the electrode matches the base material to avoid weak or brittle welds.
Operating Conditions	Consider factors like temperature, pressure, and exposure to wear or corrosion.
Weld Quality Requirements	High-stress components require electrodes that provide deep penetration and strong bonds.
Welding Position	Choose electrodes suited for specific positions (e.g., flat, vertical, overhead).
Preheating and Post-Weld Treatment	Preheating minimizes thermal stress, and post-weld treatment enhances weld durability.
Manufacturer Guidelines	Follow the electrode manufacturer's recommendations for amperage, polarity, and usage.



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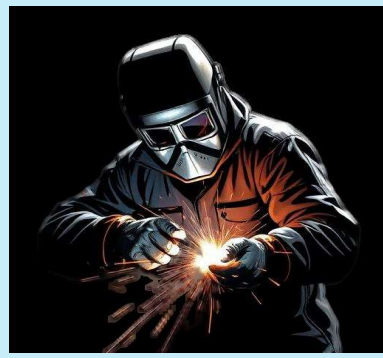
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Common Challenges and Solutions

Challenge	Details	Solution
Weld Cracking	Caused by improper electrode selection or insufficient preheating.	Use low-hydrogen electrodes and ensure preheating.
Abrasion Resistance	Components wear out quickly in abrasive environments.	Apply hardfacing electrodes to affected areas.
Corrosion Resistance	Components exposed to moisture or chemicals degrade over time.	Use stainless steel or nickel-based electrodes.
Dissimilar Metal Welding	Weak joints may form when welding different metals.	Use compatible electrodes like nickel-alloy.
Heat Distortion	Excessive heat input can distort thin metal components.	Use controlled heat and appropriate welding techniques.

Conclusion

Welding electrodes are vital to the steel industry, ensuring the fabrication, maintenance, and repair of critical equipment and structures. Proper selection and use of welding electrodes enhance productivity, reduce downtime, and extend the lifespan of machinery and components. Adopting the latest welding technologies and techniques can help steel industries meet modern challenges and maintain operational efficiency.

Recommendations

- Train welding personnel on advanced welding techniques and electrode types.
- Maintain an inventory of specialized electrodes for high-wear and high-temperature applications.
- Establish a regular maintenance schedule for critical components.
- Collaborate with electrode manufacturers to develop customized solutions for unique challenges.
- Implement quality assurance protocols to ensure consistent weld integrity in critical applications.

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