



Magna
Welding Alloys



Total Maintenance Welding Solutions for Oil Refineries





Petroleum/Oil refining is the processing of crude oil into more useful products and by-products such as petroleum naphtha, gasoline, diesel fuel, asphalt base, heating oil, kerosene and liquefied petroleum gas, as well as feedstocks for other downstream processing. Processes in refineries frequently operate at high temperatures and pressures using equipment subjected to stress and corrosion. Owing to the adverse operating conditions, maintenance of equipment in oil refineries is a tough task.

With spiralling costs of maintenance, labor and expensive new parts challenging petroleum/oil refineries today, scraping or replacing of parts is not a satisfactory answer. The alternative is to salvage expensive parts by a comprehensive maintenance system. The most reliable way is to rebuild and reclaim equipment with maintenance welding solutions. Extending the life of equipment parts through the use of electrodes is the most preferred and economic method. Maintenance professionals should understand the conditions for production welding are entirely different from conditions for maintenance welding. In production welding the base metal is known, welding environments are ideal and projects are repetitive. In maintenance welding the base metals are unknown, welding conditions are less than ideal and repairs often are carried out on rusty and dirty parts.

The challenge now is not to prove welding as the preferred solution, but to identify a truly preferred solutions provider. Whether you are the Operation Manager, Maintenance Manager, or Maintenance Engineer, your day-to-day challenge is to maximize the return on every dollar you invest in your assets and maintenance jobs. You need a reliable and professional partner who can offer you a genuine wear management system. Magna Welding Alloys is your ultimate answer.

How Magna Welding Alloys Benefits You

Magna Welding Alloys, a Division of ITW PP & F Korea Limited, has been pioneering since 1968, the concept of "Total Maintenance Welding Solution" for the Power Plants in order to achieve the following objectives:

- Reduction in inventories
- Improved availability of equipment
- Extensions of overhaul intervals
- Minimising labour cost
- Shorter shutdowns and faster start-ups

Research and Development:

Magna's Research team is continuously formulating products to meet the demands and changing trends of Power Plants worldwide. Its team is dedicated to working in close partnership with its distributors and customers to provide a quality and comprehensive product range with complete technical back up service.

Network of Distributors:

The competitive advantage of Magna Welding Alloys is the ability to respond to customer's application needs and supply products quickly through its extensive network of Distributors and Marketing Consultants around the world.

Environmental Policy:

Magna Welding Alloys recognizes environmental protection as an integral part of its business activities. The company has an environmental policy that aims to minimize impact on its customers, its employees and the community. Objectives set within the policy are directed at conserving natural resources and reducing waste generated in areas of its activities.

Internet and Intranet site:

Magna's Marketing Consultants located at various cities and its Distributors utilize an information system provided by the Internet Technology in order to respond almost immediately to customer's queries.

Personal Service from our Technical Specialist:

Magna Welding Alloys highly trained Marketing Consultants, Distribution Representatives and Welding Consultants are available to provide a complete package (ask for details from your local representative) to determine your individual welding needs which include the following:

Customer Support Service:

- Problems and complaints investigation
- Responding to Technical enquiries
- Base metal applications recommendation

In-house training program:

- Trained Representatives can conduct seminars and presentations on a continuous basis, covering subjects such as cost savings, product applications and health and safety requirements.
- In-house training programs are customised on request

On site visits:

- Regular on sites visits conducted by Marketing Consultants and Distribution Representatives
- On-site visits can be conducted by Welding Specialists on request
- On-site demonstrations can be conducted by Distribution Representatives on request

For many welding products, Magna uses high purity core wire generally having a much higher content of noble or semi-noble metals such as nickel, molybdenum, columbium, cobalt etc. than ordinary consumable manufacturers. Also its electrodes are coated with the state of the art - "**Magna Flux Coating**" technology formulated for maintenance welding.

Check with your local Magna Welding Alloys Distributor for a comprehensive list of products that are available.

Gas / TIG Welding Rods for Oil Refinery

Magna 55 Superior Alloy for Aluminium

Magna 55 is an aluminium alloy that welds all types of aluminium - both sheet and cast. Its unique two-stage melting range is excellent for both thin-flowing and rebuilding applications. It can also be used as a TIG filler metal for joining aluminium and aluminium Alloys.

Magna 77F Super Strength Universal Flux-Coated Brazing Alloy

Magna 77F has a tensile strength double that of most ordinary brazing rods. It can be used on nearly all metals including cast iron, bronze, brass, monel, stainless steel, nickel and all steels.

Magna 303 TIG Super-Strength Non-Cracking Alloy for All Steels

Magna 303 TIG is the perfect filler rod for demanding MRO applications since it provides dense, porosity free deposits that are extremely strong & crack-resistant and provide excellent resistance to heat and corrosion. It is designed for joining virtually all kinds of steels such as carbon steel to stainless steel, most Ferrite & Martensitic steels.

Magna 309 FC TIG "RootGard"

Magna 309 is a unique flux cored TIG welding rod designed for root run application without the need of inert gas purging for back shielding. It is the most versatile root pass TIG welding rod for repairing pipes of many types of austenitic steel, carbon steel, low alloy steel, and their combinations, ie. dissimilar steels.

Arc Welding Electrodes for Oil Refinery

Magna 210 Super-Versatile Electrode for Copper Alloys

Magna 210 is excellent for joining a wide variety of dissimilar metals. It is highly resistant to wear and corrosion. It is excellent for rebuilding butterfly valves, Scott blower bushes and water pump impellers.

Magna 303 GOLD Ferrite Balanced Super-Strength Non-Cracking Alloy for All Steels

Magna 303 Gold is a maintenance electrode that welds all steels including high alloy steels. It welds dissimilar metal combinations and gives a deposit length that is 20-25% more than normal electrode. It provides excellent heat and corrosion resistance.

Magna 305 Super Tough Alloy for High Strength Steels

Magna 305 is a high alloy electrode for welding T-1 and other heavy-duty steels. Magna 305 is used as an overlay on worn parts where good machinability is necessary.

Magna 307 "Magnamatic" Electrode for Mild Steel

Magna 307 is an all position alloy steel electrode. It is designed for repair work on mild steel, particularly "on site" and restrictive positions.

Magna 393 Corrosion-Resistant Alloy for Stainless Steel

Magna 393 is an advanced, all-position alloy for stainless steel that offers high corrosion resistance and ease of welding. It can be used for the repair of virtually any type or grade of stainless steel.

Magna 395 Special Alloy for Duplex Stainless Steel

Magna 395 is a special alloy engineered for the welding and repair of Duplex Stainless Steels. The deposits provided by Magna 395 are stress corrosion crack-resistant, resistant to general crevice and pitting corrosion and virtually immune to intergranular corrosion. It also features good saltwater corrosion resistance in addition to high tensile strength and good weldability.

Magna 401 Universal Hardfacing Electrode

Magna 401 does not crack even if applied in volume or welded rapidly without cushioning. It consists of a tough ferritic matrix that resists both impact and abrasion.

Magna 402 Impact-Resistant Alloy for Manganese Steel

Magna 402 is an electrode, which is austenitic in structure and non-cracking. It can withstand extreme shock, loading and impact. It is ideal for overlays and rebuilding of worn components subjected to severe operating conditions.

Magna 404 Hardfacing Electrode for Extreme Abrasion

Magna 404 contains hard tungsten cobalt carbides in a tough alloy steel matrix. This special formulation is designed to resist severe grinding abrasion and extreme wear. The electrode can be applied using either torch or arc welding equipment.

Magna 770 High-Strength Non-Cracking Machinable Electrode for Cast Iron

Magna 770 is specially designed to weld all types of cast iron encountered in maintenance applications. It requires little or no preheating. It is ideal for repairing and rebuilding of engine housings, water pump housings, compressor cylinder block housings, and gear box housings.

Magna 8N12 Universal Electrode for Nickel Alloys

Magna 8N12 is a special electrode for welding wide variety of metals and alloys and their unusual combinations. It can join carbon steels, alloy steels, stainless steels, monel, inconels, stellites, hastelloys and their dissimilar combinations. It resists high temperatures up to 1205°C to help prevent cracking. It also provides excellent corrosion resistance.

Magna Alloy C Nickel-Based Electrode for Hastelloy Materials

Magna Alloy C is a super high alloy electrode specially designed to cope with problems of corrosion, heat and impact. It deposits an entirely complex alloy system. Its content of high cobalt, tungsten, nickel, chromium and molybdenum provides extra high physical properties at elevated temperatures. It provides outstanding hardness retention even at elevated temperatures.

Magna Welding Alloys Specialities

Magna 940 Rapid Repair Compound

Magna 940 is an instant repair compound that is excellent for "cold" repairs on parts and surfaces made of steel, copper, aluminium, cast iron, stainless steel, brass and chrome.

2/ Thermal Cracking - Coking (Delayed) Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Fractionator	C-Mn Steel	M303 Gold, M305, M307	SS 410S	M8N12
	1.25Cr-0.5Mo Steel	M8N12	SS 308L / SS 316L	M393
Furnace	SS 304H / SS 310	M8N12	NA	
Coke Drum	1.25Cr -0.5Mo Steel	M8N12	SS 410S	M8N12
			Alloy 625	MALLOY C

3/ Catalytic Cracking - FCC Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Feed/Effluent Heat Exchanger	C -0.5Mo Steel	M305	SS 308L / SS 316L	M393
	1.25Cr-0.5Mo Steel / 2.25Cr-1Mo Steel / 2.25Cr-1 Mo-0.25V steel	M8N12	SS 347	M8N12
Fractionator	C-Mn Steel	M303 Gold, M305, M307	SS 410S	M8N12
	1.25Cr-0.5Mo Steel	M8N12	SS 308L / SS 316L	M393
FCC Regenerator	C-Mn Steel	M303 Gold, M305, M307	SS 308H	M8N12
	C-0.5Mo Steel	M305	NA	
FCC Reactor	2.25Cr-1Mo Steel / 2.25Cr-1Mo-0.25V Steel	M8N12	SS 410S	M8N12

4/ Hydrocracking Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Fractionator	C-Mn Steel	M303 Gold, M305, M307	SS 410S	M8N12
	1.25Cr-0.5Mo Steel	M8N12	SS 308L / SS 316L	M393
Hydrocracking Reactor	2.25Cr-1Mo Steel / 2.25Cr-Mo-0.25V Steel	M8N12	SS 347	M8N12
Hot Separator	2.25Cr-1Mo Steel	M8N12	SS 347	M8N12
Cold Separator	C-Mn Steel	M303 Gold, M305, M307	SS 316L	M393
Furnace	SS 304H / SS 310	M8N12	NA	

5/ Catalytic Reforming - CCR Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Naptha Reformer Reactor	1.25Cr-0.5Mo steel	M8N12	NA	
Feed/Effluent Heat Exchanger	C -0.5Mo Steel	M305	SS 308L / SS 316L	M393
	1.25Cr-0.5Mo Steel / 2.25Cr-1Mo Steel / 2.25Cr-1 Mo-0.25V steel	M8N12	SS 347	M8N12
Reformer Furnace	Alloy 800 / Alloy 800H	M8N12	NA	
CCR Regenerator	C-0.5Mo Steel	M305	NA	
	Alloy 800 / Alloy 800H	M8N12	NA	

NA : NOT APPLICABLE

6/ Hydro-desulfurization / treating Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Feed/Effluent Heat Exchanger	C -0.5Mo Steel	M305	SS 308L / SS 316L	M393
	1.25Cr-0.5Mo Steel / 2.25Cr-1Mo Steel / 2.25Cr-1 Mo-0.25V steel	M8N12	SS 347	M8N12
HDS Reactor	C-Mn Steel	M303 Gold, M305, M307	SS 347	M8N12
	2.25Cr-1Mo Steel / 2.25Cr-1Mo-0.25V Steel	M8N12	NA	
Separator	2.25Cr-1Mo Steel	M8N12	SS 347	M8N12
	C-Mn Steel	M303 Gold, M305, M307	SS 316L	M393

7/ Isomerization Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Feed/Effluent Heat Exchanger	C -0.5Mo Steel	M305	SS 308L / SS 316L	M393
	1.25Cr-0.5Mo Steel / 2.25Cr-1Mo Steel / 2.25Cr-1 Mo-0.25V steel	M8N12	SS 347	M8N12
Fired Heater	SS 304H / SS 310	M8N12	NA	
Hydrogenation Reactor	1.25Cr-0.5Mo Steel / 2.25Cr-1Mo Steel	M8N12	SS 347	M8N12
Isomerization Reactor	1.25Cr-0.5Mo Steel	M8N12	NA	
	C-Mn Steel	M303 Gold, M305, M307	NA	
Separator	2.25Cr-1Mo Steel	M8N12	SS 347	M8N12
	C-Mn Steel	M303 Gold, M305, M307	SS 316L	M393

8/ Alkylation Process				
Major Equipment	Base Materials (Joining Alloys)	Magna Solution for Base Materials	Overlay Materials (Weld Deposit Overlay)	Magna Solution for Overlay Materials
Fractionator	C-Mn Steel	M303 Gold, M305, M307	SS 410S	M8N12
	1.25Cr-0.5Mo Steel	M8N12	SS 308L / SS 316L	M393
Alkylation Reactor	C-Mn Steel	M303 Gold, M305, M307	Alloy 625 / Alloy 825	MALLOY C
Acid Settler	C-Mn Steel	M303 Gold, M305, M307	NA	

NA : NOT APPLICABLE

Recommended Magna Maintenance Welding Applications - Oil Refineries (General)

General / Others		
Magna Application	Arc	Gas/TIG
Bronze Pump Impellers / Housings	M210	M77F
Rebuilding Bronze Valves	M210	M77F
Repairing Oil pump Pistons	M 303 Gold	-
Repairing Pipe Alloy Cr-Mo P21 & P22	M303 Gold, M8N12	M303 TIG
Most Carbon Steel Pipes--Root Run	M303 Gold	M303 TIG, M309 TIG
Alloy Steel & Cr-Mo Pipes--Root Run	M303 Gold, M8N12	M303 TIG, M309 TIG
Repairing Stainless Steel Pipes at Workshop / In-situ	M393	M309 TIG
Repairing Dissimilar Steel Pipes at Workshop / In-situ	M303 Gold, M8N12, M393	M303 TIG, M309 TIG
Stainless Steel Lining on Towers	M393	-
Rebuilding Stainless Valves	M393	-
Rebuilding Boring Bits	M401, M404	-
Building Up Rails	M303 Gold, M402	-
Repairing Cast Iron Pumps / compressors	M770	-
Rebuilding Cast Iron Valves	M770	M77F
Aluminum Nozzles on Gasoline Handling Equipment	-	M55
Repairing Cracking Furnace Components	M8N12	-



About ITW

ITW (NYSE:ITW) is a Fortune 200 global multi-industrial manufacturing leader. The company's seven industry-leading segments leverage the unique ITW Business Model to drive solid growth with best-in-class margins and returns in markets where highly innovative, customer-focused solutions are required. ITW has nearly 50,000 dedicated colleagues in operations around the world who thrive in the company's unique decentralized and entrepreneurial culture. To learn more about the company and the ITW Business Model, visit www.itw.com.

To offer the best service to each market segment, ITW PP & F Korea Limited operates the following divisions that are branded uniquely for the most prominent recognition by users and customers:



OMEGA Ultimate Lubricants

Specializing in lubrication solutions - greases, oils and additives



MAGNA Welding Alloys

Specializing in gas and arc welding consumables for maintenance



CORIUM Industrial Chemicals

Specializing in industrial & commercial chemicals and adhesives



ZETALUBE Lubricants

A new lubricity dimension evolved from experience

WE SUPPLY SUPERIOR PRODUCTS THAT MAKE MAINTENANCE:

- FASTER
- SAFER
- MORE RELIABLE

Our products are engineered to:

- Lower costs
- Reduce downtime
- Cut wastage

At ITW PP & F Korea Limited we are fully committed to a proactive approach to safety, health, environment and product improvement. Our commitment is well reflected in:

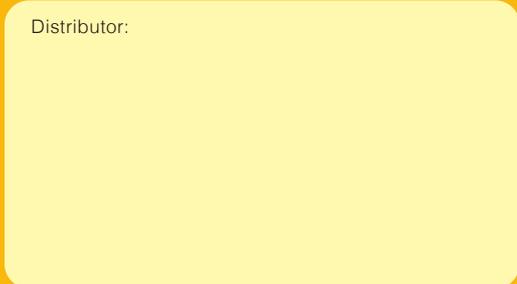
- Our continuous Research and Developments
- Our on-going in-house Training and our in-house Training Facilities
- Our comprehensive range of Quality Products
- Our many long-term Repeat Customers.

Contact Us



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ITW PP & F Korea Limited is a business unit of Illinois Tool Works Inc. (ITW), U.S.A.