

MAGNA 401 AC-DC

An electrode for wear resistance which has the following unique properties:

- 1. Complex Research Formulation.** Magna 401 consists of a tough shock resistant ferritic matrix which has super hard crystals of quartz-like compounds, silicides and carbides. The carbides and silicides are very fine and evenly dispersed throughout the deposit. This structure makes it possible for Magna 401 to withstand both impact and abrasion. The tough matrix absorbs the shock while the fine carbides resist abrasion. The carbides and silicides precipitate spontaneously as the electrode is deposited. For a wide range of general purpose applications, this electrode outwears ordinary hard facing rods up to 4 to 1.
- 2. Super Weldability.** Magna 401 can be deposited pass-over-pass without slag removal. The slag has a light viscosity and it is not necessary for the welder to remove slag between passes. The electrode is completely stable at low current settings and performs well on AC.

Magna 401 can be applied in vertical and overhead positions. This is unique for a hard surface electrode since most are adaptable only to flat position welding. This feature makes it possible to overlay equipment in position without dismantling. There is no spatter, no porosity and slag is easily removed. Magna 401 can be cut with oxyacetylene torch when desired.

- 3. Positively Non-Cracking.** Many cheap hard surface electrodes check and crack. Naturally their ability to provide service is handicapped by the cracks and generally the cracks propagate and cause a complete breakdown of the equipment. Magna 401 does not crack even if applied in large volume and even if applied rapidly, it requires no cushion of buffer layer. The deposit is so tough that it will not crack even without cushioning.
- 4. Remarkable Wear Resistance.** Numerous wear tests have proven that Magna 401 will outwear any hard facing rod in its class. The fact that it withstands both abrasion and impact makes it especially outstanding. It can be used where the exact nature of the exact type of wear is not known. It

PIM 401.1	Version 2.0	Revision 1.0	Rev. Date: 1 January, 2016	Reference: CKL
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does not lose wear resistance in multi layer applications as ordinary hard facing rods do.

APPLICATION

Magna 401 provides excellent arc characteristics using DC Straight Polarity (electrode negative), DC Reverse Polarity (electrode positive) or AC (alternating current). It has a high deposition rate.

Because of its unique coating, with Magna 401 unusually high amperages can be employed without excessive penetration and without overheating the electrode. An exceedingly smooth overlay results. In manufacture, Magna 401 is baked at high temperature for a long period of time and the coating is all mineral, thus no underbead cracking occurs. There is virtually no spatter and slag is easily removed.

Magna 401 can be used on Carbon Steels and Low Alloy Steel as well as most abrasion-resistant steels.

A slight weaving is preferred in application. Alloy steels and high carbon steels should be pre-heated. Magna 401 can be used in all positions, flat, vertical and overhead.

AMPS Required

1/8"	90-130
5/32"	140-180

Area covered per pound 1/8" depth - 26 sq. inches.

The weld cannot be machined but can be forged or heat-treated.

Typical Applications

Ditcher Rollers
Tractor Rollers
Tractor Idlers
Elevator bucket lips
Shovel Rollers
Dragline bucket pins and links

Dredge Speed Points
Dredge Driving Tumblers
Cane Brake Drums
Mill Brake Drums
Shovel Idlers
Cable Sheaves
Cable Sheaves Shafts
Shovel latch pins and keepers
Shovel bottom heels

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ITW PP & F Korea Limited reserves the right to modify or change this product for purposes of improving its performance characteristics.

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SAFETY DATA SHEET



Product name: Magna 401 Page: 1/10
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Product No.: SDS-ID: GB-EN/3.0

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier

Product name: Magna 401

1.2. Relevant identified uses of the substance or mixture and uses advised against

Application: Universal Hardfacing Electrode

1.3. Details of the supplier of the safety data sheet

Supplier: GB importer: Distributed by: Trust Engineering Company
Manufacturer: ITW PP & F Korea Limited 9 Abdel Hamid El Deeb Street
13th Fl., Unit B, PAX Tower Alexandria, 21613 Egypt
609 Eonju-ro, Gangnam-Gu T: +(20)3 5822779 T: +(20)10 1223554
Seoul, Korea 06108 5 Ahmed Shaker Street Fourth Zone
Tel:+82-2-2088-3560 Nasr City, 11586 Egypt
Fax:+82-2-513-3567 T: +(20)2 26909965 T: +(20)10 1223553
magna@magnagroup.com info@trustengineering-eg.com
www.magnagroup.com www.trustengineering-eg.com
Further information can be magna@magnagroup.com
obtained from:

1.4. Emergency telephone number

Emergency telephone: Call a Poison Center, emergency number or doctor/physician.
NHS: 111

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

CLP: The product is not classified.

2.2. Label elements

Solid metals and alloys do not require a hazard label if they do not present a danger to human health or the environment in the form in which they are placed on the market. The information which would have appeared on the label is shown here.

Safety data sheet available on request.

2.3. Other hazards

PBT/vPvB: This product does not contain any PBT or vPvB substances.

Other: Prolonged or repeated exposure to welding fumes may cause damage to the lungs and respiratory system. Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

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3.2. Mixtures

Only classified substances above threshold limits or substances with an exposure limit are shown.
All substances in the product are either registered or exempt from registration under REACH.

CLP:

<u>%:</u>	<u>CAS-No.:</u>	<u>EC No.:</u>	<u>REACH Reg. No:</u>	<u>Chemical name:</u>	<u>Hazard classification:</u>	<u>Notes:</u>
60-100	7439-89-6	231-096-4	-	Iron	-	#
1-10	1312-76-1	215-199-1	-	Silicic acid, potassium salt	Skin Irrit. 2;H315 Eye Irrit. 2;H319	
1-10	1332-58-7	310-194-1	-	Kaolin	-	#
1-10	7440-47-3	231-157-5	-	Chromium	-	#
1-10	13463-67-7	236-675-5	-	Titanium dioxide	-	#
1-10	1317-65-3	215-279-6	-	Limestone	-	#
1-10	7439-96-5	231-105-1	-	Manganese	-	#
1-10	9004-34-6	232-674-9	-	Cellulose	-	#

Notes: #: The substance has been assigned an exposure limit.

References: The full text for all hazard statements is displayed in section 16.

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

Inhalation: Inhalation of welding fumes: Move into fresh air and keep at rest. In case of persistent throat irritation or coughing: Seek medical attention and bring these instructions.

Skin contact: Remove contaminated clothes and rinse skin thoroughly with water.

Eye contact: Do not rub eye. If irritation occurs during dust-raising work, flush with plenty of water for at least 15 minutes.

Ingestion: Not likely, due to the form of the product.

4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects: See section 11 for more detailed information on health effects and symptoms.

4.3. Indication of any immediate medical attention and special treatment needed

Medical attention/treatments: Treat symptomatically.

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SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

Extinguishing media: Use fire-extinguishing media appropriate for surrounding materials.

5.2. Special hazards arising from the substance or mixture

Specific hazards: During fire, gases hazardous to health may be formed.

5.3. Advice for firefighters

Protective equipment for fire-fighters: Selection of respiratory protection for fire fighting: follow the general fire precautions indicated in the workplace.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Follow precautions for safe handling described in this safety data sheet.

6.2. Environmental precautions

Environmental precautions: The product should not be dumped in nature but collected and delivered according to agreement with the local authorities.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up: Recover the product and place in a suitable container for reuse.

6.4. Reference to other sections

References: For personal protection, see section 8.
For waste disposal, see section 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Safe handling advice: When welding: Do not breathe fumes. Observe good chemical hygiene practices.

Technical measures: No special precautions.

Technical precautions: When welding:
Mechanical ventilation may be required.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures for safe storage: No special precautions.

Storage conditions: Store in closed original container in a dry place.

7.3. Specific end use(s)

Specific use(s): Not relevant.

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SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits:

<u>CAS-No.:</u>	<u>Chemical name:</u>	<u>As:</u>	<u>Exposure limits:</u>	<u>Type:</u>	<u>Notes:</u>	<u>References:</u>
-	Iron oxide, fume	Fe	5 mg/m3	TWA	-	EH40
		-	10 mg/m3	STEL	15min	
-	Chromium (VI) compounds (process generated)	Cr	0.025 mg/m3	TWA	Carc; Sen; BEI	EH40
7440-47-3	Chromium	-	0.5 mg/m3	TWA	-	EH40
-	Chromium (VI) compounds	Cr	0.01 mg/m3	TWA	Carc; Sen; BEI	EH40
9004-34-6	Cellulose, inhalable dust	-	10 mg/m3	TWA	-	EH40
		-	20 mg/m3	STEL	15min	
9004-34-6	Cellulose, respirable dust	-	4 mg/m3	TWA	-	EH40
1332-58-7	Kaolin, respirable dust	-	2 mg/m3	TWA	-	EH40
1317-65-3	Limestone, total inhalable dust	-	10 mg/m3	TWA	-	EH40
1317-65-3	Limestone, respirable dust	-	4 mg/m3	TWA	-	EH40
13463-67-7	Titanium dioxide, total inhalable dust	-	10 mg/m3	TWA	-	EH40
13463-67-7	Titanium dioxide, respirable dust	-	4 mg/m3	TWA	-	EH40
-	Magnesium oxide, inhalable dust	Mg	10 mg/m3	TWA	-	EH40

Notes:

Carc: Capable of causing cancer and/or heritable genetic damage.
Sen: Capable of causing occupational asthma.
BEI: Biological Exposure Index.
EH40: EH40/2005.

8.2. Exposure controls

Engineering measures:

When welding: Provide adequate ventilation. Observe Occupational Exposure Limits and minimise the risk of inhalation of dust and fumes.

Personal protection:

Personal protection equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment.

When welding: Use special welding equipment for protection of eyes, skin and respiratory system.

Hygiene measures:

Wash hands after handling. Change contaminated clothing.

Environmental Exposure

Not available.

Controls:

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state: Wire with a flux coating.

Colour: Grey.

Odour: Not available.

Odour threshold: Not available.

pH: Not available.

Melting point / freezing point: 850-1100°C

Boiling point: Not available.

Flash point: Not available.

Evaporation rate: Not available.

Flammability (solid, gas): Not available.

Explosive limits Not available.

Vapour pressure: Not available.

Vapour density: Not available.

Relative density: 6-9 g/cm³

Solubility: Insoluble in water

Partition coefficient (n-octanol/water): Not available.

Auto-ignition temperature (°C): Not available.

Decomposition temperature (°C): Not available.

Viscosity: Not available.

Explosive properties: Not available.

Oxidising properties: Not available.

9.2. Other information

Other data: Not available.

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SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Reactivity: Stable under normal conditions.

10.2. Chemical stability

Stability: Stable under normal temperature conditions and recommended use.

10.3. Possibility of hazardous reactions

Hazardous Reactions: None known.

10.4. Conditions to avoid

Conditions to avoid None specific.

10.5. Incompatible materials

Incompatible materials: Water, moisture. Avoid contact with acids.

10.6. Hazardous decomposition products

Hazardous decomposition products: None under normal conditions.
When welding: Metal oxides. See section 3.

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SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Acute Toxicity (Oral): Based on available data, the classification criteria are not met.

Acute Toxicity (Dermal): Based on available data, the classification criteria are not met.

Acute Toxicity (Inhalation): Based on available data, the classification criteria are not met.

Skin Corrosion/Irritation: Based on available data, the classification criteria are not met.

Serious eye damage/irritation: Based on available data, the classification criteria are not met.

Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

Germ cell mutagenicity: Based on available data, the classification criteria are not met.

Carcinogenicity: Based on available data, the classification criteria are not met.

Reproductive Toxicity: Based on available data, the classification criteria are not met.

STOT - Single exposure: Based on available data, the classification criteria are not met.

STOT - Repeated exposure: Based on available data, the classification criteria are not met.

Aspiration hazard: Based on available data, the classification criteria are not met.

Inhalation: Heating above the melting point releases metallic oxides which may cause metal fume fever by inhalation. The symptoms are shivering, fever, malaise and muscular pain.

Skin contact: May cause allergic skin disorders in sensitive individuals.

Eye contact: Particles/fumes in the eyes may cause discomfort/irritation.

Ingestion: Not likely, due to the form of the product.

Specific effects: Prolonged or repeated exposure to welding fumes may cause damage to the lungs and respiratory system.

Toxicological data:

LD50 (oral, rat):
Limestone: >2000 mg/kg
Cellulose: : >5000 mg/kg
Chromium: 19,8 mg/kg
Manganese: 9000 mg/kg
Titanium dioxide: >10000 mg/kg
Iron: 30000 mg/kg

LC50 (inhalation, rat):
Limestone: >3 mg/l/4 h

11.2. Information on other hazards

Endocrine disrupting properties: The product does not contain any substance identified as having endocrine disrupting properties.

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SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxicity: Not regarded as dangerous for the environment.

12.2. Persistence and degradability

Degradability: The product solely consists of inorganic compounds which are not biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No data available on bioaccumulation.

12.4. Mobility in soil

Mobility: No data available.

12.5. Results of PBT and vPvB assessment

PBT/vPvB: This product does not contain any PBT or vPvB substances.

12.6. Endocrine disrupting properties

Endocrine disrupting properties: The product does not contain any substance identified as having endocrine disrupting properties.

12.7. Other adverse effects

Other adverse effects: None known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Dispose of waste and residues in accordance with local authority requirements. Waste is classified as hazardous waste.

Waste from residues: EWC-code: 12 01 13

Contaminated packaging: Dispose of contaminated packings as residue.

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SECTION 14: TRANSPORT INFORMATION

The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/AND/RID).

14.1. UN number

UN-No: -

14.2. UN proper shipping name

Proper Shipping Name: -

14.3. Transport hazard class(es)

Class: -

14.4. Packing group

PG: -

14.5. Environmental hazards

Marine pollutant: -

Environmentally Hazardous substance: -

14.6. Special precautions for user

Special precautions: Not relevant.

14.7. Transport in bulk according to Annex II of MARPOL and the IBC Code

Transport in bulk: Not relevant.

SECTION 15: REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulation: UK Statutory Instruments, 2021 No. 904, CONSUMER PROTECTION ENVIRONMENTAL PROTECTION HEALTH AND SAFETY. The REACH etc. (Amendment) Regulations 2021.
Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 with amendments.
The Chemicals (Health and Safety) and Genetically Modified Organisms (Contained Use) (Amendment etc.) (EU Exit) Regulations 2019 (SI 2019 No. 720), as amended.
The Control of Substances Hazardous to Health Regulations 2002 (S.I 2002 No. 2677) with amendments.
EH40/2005, Workplace exposure limits 2005, with amendments.
The List of Wastes (England) (Amendment) Regulations 2005. (SI 2005 No. 895).

15.2. Chemical Safety Assessment

CSA status: No chemical safety assessment has been carried out.

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SECTION 16: OTHER INFORMATION

The user must be instructed in the proper work procedure and be familiar with the contents of these instructions.

The following sections contain revisions or new statements: 1, 8, 9, 10, 11, 12, 13, 15, 16.

Magna Welding Alloys
13th Fl., Unit B, PAX Tower,
609, Eonju-Ro, Gangnam-Gu, Korea 06108
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Abbreviations and acronyms

used in the safety data sheet: CSA= Chemical Safety Assessment.
LC50 = Lethal Concentration 50%.
LD50 = Lethal Dose 50%.
PBT = Persistent, Bioaccumulative and Toxic.
vPvB = very Persistent and very Bioaccumulative.

Additional information: Classification according to Regulation (EC) No. 1272/2008: Calculation method.

Wording of H-statements:

H315 Causes skin irritation.
H319 Causes serious eye irritation.

The information on this data sheet represents our current data and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.

Made by DHI - Environment and Toxicology, Agern Allé 5, DK-2970 Hørsholm, Denmark.
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