K-EG2

Material Safety Data Sheet

In Accordance with MOEL Public notice No 2020-130
MSDS Number: AA06900-0000000241
Issue date: 6/28/1996 Revision date: 3/4/2024 Version: 6.1

1. Chemical product and company identification

1.1. Product identifier

Product form : Mixture
Trade name : K-EG2

1.2. Recommended uses and restrictions

Use Categories

35 - Welding and soldering products, flux products

1.2.1. Recommended use

Welding and soldering products, flux products.

1.2.2. Restrictions on use

1.3. Supplier information

- Supplier

Company : KISWEL
Address : (51544) South Korea 704, Gongdan-ro, Seongsan-gu, Changwon-si, Gyeongnam, Korea
Tel. : 055)269-7200
Fax : 055)266-4487

2. Hazards identification

2.1. Classification of the substance or mixture

Respiratory sensitisation, Category 1	H334
Skin sensitisation, Category 1	H317
Carcinogenicity, Category 2	H351
Specific target organ toxicity - Repeated exposure, Category 2	H373
Hazardous to the aquatic environment – Chronic Hazard, Category 3	H412

2.2. Label elements

2.2.1. Hazard pictograms (GHS KR)



2.2.2. Signal word (GHS KR)

Danger.

2.2.3. Hazard statements (GHS KR)

H317 - May cause an allergic skin reaction.
H334 - May cause allergic reactions, asthma or shortness of breath and etc if inhaled.
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure.
H412 - Harmful to aquatic life with long lasting effects.

2.2.4. Precautionary statements (GHS KR)

Precaution:

P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe dust/fume/gas/mist/vapours/spray.
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P273 - Avoid release to the environment.
P280 - Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.
P284 - Wear respiratory protection.

Treatment:

P302+P352 - IF ON SKIN: Wash with plenty of water/….
P304+P340 - IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.
P321 - Take … treatment.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER/doctor/….
P362+P364 - Take off contaminated clothing and wash it before reuse.

Storage:

P405 - Store locked up.

Disposal:

P501 - Dispose of contents/container according to waste related regulations.

2.3. Hazards - Other hazards which do not result in classification - Hazard Risk

Not applicable

3. Composition/information on ingredients

Product form : Mixture

Substance name	Other Names	Product identifier number	Concentration (%)
Iron	Iron, elemental / Direct reduced Iron / Iron, reduced / Elemental iron / IRON POWDER / iron	CAS-No.: 7439-89-6 KECI-No.: KE-21059	90 – 98
Manganese	Manganese, elemental / Manganese metal / manganese	CAS-No.: 7439-96-5 KECI-No.: KE-22999	1 – 4

4. First-aid measures

4.1. First-aid measures after eye contact

Rinse eyes with water as a precaution.

4.2. First-aid measures after skin contact

Wash skin with plenty of water.
Take off contaminated clothing.
If skin irritation or rash occurs: Get medical advice/attention.

4.3. First-aid measures after inhalation

Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms: Call a poison center or a doctor.

4.4. First-aid measures after ingestion

Call a poison center or a doctor if you feel unwell.

4.5. Other medical advice or treatment

Treat symptomatically.

5. Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media : Water spray. Dry powder. Foam.
Unsuitable extinguishing media : No data available

5.2. Special hazards arising from the substance or mixture

No data available

5.3. Special protective equipment and precautions for fire-fighters

Protection during firefighting : Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Ventilate spillage area.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid contact with skin and eyes.
Do not attempt to take action without suitable protective equipment.
For further information refer to section 8: "Exposure controls/personal protection".
Dispose of materials or solid residues at an authorized site.

6.2. Environmental precautions and protective procedures

Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

Mechanically recover the product.
Notify authorities if product enters sewers or public waters.

7. Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Ensure good ventilation of the work station.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Wear personal protective equipment.
Do not breathe dust/fume/gas/mist/vapours/spray.
Avoid contact with skin and eyes.

Hygiene measures : Contaminated work clothing should not be allowed out of the workplace.
Wash contaminated clothing before reuse.
Do not eat, drink or smoke when using this product.
Always wash hands after handling the product.

7.2. Conditions for safe storage

Storage conditions : Store locked up.
Store in a well-ventilated place.
Keep cool.

8. Exposure controls/personal protection

8.1. Occupational Exposure Limits

K-EG2	
No data available	

Iron (7439-89-6)	
Korea - Occupational Exposure Limits	
Local name	철 염 (가 용 성) # Iron salts (Soluble, as Fe)
ISHA OEL TWA	1 mg/m³
Regulatory reference	고 용 노 동 부 고 시 제 2020-48호 # MOEL Public Notice. No. 2020-48
China - Occupational Exposure Limits	
Catalogue of Occupational Hazard Factors	Category 1 - Dusts
Indonesia - Occupational Exposure Limits	
NAB (OEL TWA)	1 mg/m³

Manganese (7439-96-5)	
Korea - Occupational Exposure Limits	
Local name	망 간 및 무 기 화 합 물 # Manganese&Inorganic compounds, as Mn
ISHA OEL TWA	1 mg/m³ 1 mg/m³ (흄) # (Fume)
ISHA OEL STEL	3 mg/m³ (흄) # (Fume)
ISHA PEL TWA	1 mg/m³
Regulatory reference	고 용 노 동 부 고 시 제 2020-48호 # MOEL Public Notice. No. 2020-48
China - Occupational Exposure Limits	
OEL PC-TWA	0.15 mg/m³
OEL PC-TWA (Highly Toxic Goods)	0.15 mg/m³ (dust and fume)
OEL PC-STEL (Highly Toxic Goods)	0.45 mg/m³ (dust and fume)
Catalogue of Occupational Hazard Factors	Category 3 - Chemicals
India - Occupational Exposure Limits	
PEL (OEL TWA)	1 mg/m³ (fume)
PEL (OEL STEL)	0.03 mg/m³ (fume)
PEL (OEL C)	5 mg/m³ (dust)
Indonesia - Occupational Exposure Limits	
NAB (OEL TWA)	0.1 mg/m³ (inhalable particulate) 0.02 mg/m³ (respirable particulate)
Chemical category	A4 - not classifiable as a human carcinogen
Singapore - Occupational Exposure Limits	
PEL (OEL TWA)	1 mg/m³ (dust and fume)
OEL STEL	3 mg/m³ (fume)
Singapore - BTLV	
BTLV	50 µg/l Parameter: Manganese - Medium: urine

Manganese (7439-96-5)	
Taiwan - Occupational Exposure Limits	
OEL TWA	1 mg/m³ (category C3 special chemical-fume)
OEL STEL	2 mg/m³ (category C3 special chemical-fume)
OEL C	5 mg/m³ (category C3 special chemical)
Vietnam - Occupational Exposure Limits	
OEL TWA	0.3 mg/m³
OEL STEL	0.6 mg/m³
Australia - Occupational Exposure Limits	
OES TWA [1]	1 mg/m³ (dust and fume)
OES STEL	3 mg/m³ (fume)
USA - ACGIH - Occupational Exposure Limits	
ACGIH OEL TWA	0.02 mg/m³ (respirable particulate matter) 0.1 mg/m³ (inhalable particulate matter)
ACGIH chemical category	Not Classifiable as a Human Carcinogen
USA - IDLH - Occupational Exposure Limits	
IDLH	500 mg/m³
USA - NIOSH - Occupational Exposure Limits	
NIOSH REL TWA	1 mg/m³ (fume)
NIOSH REL STEL	3 mg/m³
USA - OSHA - Occupational Exposure Limits	
OSHA PEL C	5 mg/m³ (fume)

8.2. Appropriate engineering controls

Appropriate engineering controls : Ensure good ventilation of the work station.
Environmental exposure controls : Avoid release to the environment.

8.3. Personal protection

Respiratory protection:
[In case of inadequate ventilation] wear respiratory protection. Wear respiratory protection.

Eye protection:
Safety glasses

Hand protection:
Protective gloves

Skin and body protection:
Wear suitable protective clothing

Personal protective equipment symbol(s):



9. Physical and chemical properties

a)	Appearance	:	No data available
	Physical state	:	Solid
b)	Odour	:	No data available
c)	Odour threshold	:	No data available
d)	pH	:	No data available
e)	Melting / freezing point	:	No data available / Not applicable
f)	Initial boiling point and boiling range	:	No data available
g)	Flash point	:	Not applicable
h)	Evaporation rate	:	No data available
i)	Flammability (solid, gas)	:	Non flammable.
j)	Upper / lower flammability or explosive limits	:	Not applicable
k)	Vapour pressure	:	No data available
l)	Solubility	:	No data available
m)	Vapour density	:	No data available
n)	Relative density	:	No data available
o)	Partition coefficient n-octanol/water	:	No data available
p)	Auto-ignition temperature	:	Not applicable
q)	Decomposition temperature	:	No data available
r)	Viscosity, kinematic	:	Not applicable
	Viscosity, dynamic	:	No data available
s)	Molecular mass	:	No data available

10. Stability and reactivity

10.1. Chemical stability and Possibility of hazardous reactions

The product is non-reactive under normal conditions of use, storage and transport.
Stable under normal conditions.
No dangerous reactions known under normal conditions of use.

10.2. Conditions to avoid

None under recommended storage and handling conditions (see section 7).

10.3. Incompatible materials

No data available

10.4. Hazardous decomposition products

Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

11.1. Information on exposure routes

Oral	:	Not classified
Skin and eyes contact	:	May cause an allergic skin reaction.
Inhalation	:	May cause allergic reactions, asthma or shortness of breath and etc if inhaled.

11.2. Health hazards

Acute toxicity (oral):

Not classified

Acute toxicity (dermal):

Not classified

Acute toxicity (inhalation):

Not classified

Iron (7439-89-6)	
LD50 oral rat	98600 mg/kg bodyweight Animal: rat, Animal sex: male, Guideline: OECD Guideline 401 (Acute Oral Toxicity)
LC50 Inhalation - Rat	> 250 mg/m³ air (6 h, Rat, Male, Experimental value, Inhalation (dust))

Manganese (7439-96-5)	
LD50 oral rat	> 2000 mg/kg bodyweight Animal: rat, Animal sex: female, Guideline: OECD Guideline 420 (Acute Oral Toxicity - Fixed Dose Method), Guideline: EU Method B.1 bis (Acute Oral Toxicity - Fixed Dose Procedure)
LC50 Inhalation - Rat	> 5.14 mg/l air Animal: rat, Guideline: OECD Guideline 403 (Acute Inhalation Toxicity), Guideline: EU Method B.2 (Acute Toxicity (Inhalation))
LC50 Inhalation - Rat (Dust/Mist)	> 5.14 mg/l Source: ECHA

Skin corrosion/irritation:

Not classified

Serious eye damage/irritation:

Not classified

Respiratory sensitization:

May cause allergic reactions, asthma or shortness of breath and etc if inhaled.

Skin sensitization:

May cause an allergic skin reaction.

Carcinogenicity:

Suspected of causing cancer.

Mutagenicity:

Not classified

Reproductive toxicity:

Not classified

STOT-single exposure:

Not classified

STOT-repeated exposure:

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard:

Not classified

K-EG2	
Viscosity, kinematic	Not applicable

Iron (7439-89-6)	
Density	7.87 g/cm³ Type: 'density' Temp.: 20 °C

Manganese (7439-96-5)	
Density	7200 kg/m³

12. Ecological information

12.1. Ecotoxicity

Ecology - general : Harmful to aquatic life with long lasting effects.

Hazardous to the aquatic environment, short–term (acute) : Not classified

Hazardous to the aquatic environment, long–term (chronic) : Harmful to aquatic life with long lasting effects.

Iron (7439-89-6)	
LC50 - Fish [1]	8.65 mg/l Source: ECHA
LC50 - Other aquatic organisms [1]	106.3 mg/l Source: ECHA
EC50 - Crustacea [1]	> 100 mg/l Test organisms (species): Daphnia magna
EC50 - Crustacea [2]	> 10000 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	18 mg/l Source: ECHA

Manganese (7439-96-5)	
LC50 - Fish [1]	> 3.6 mg/l Test organisms (species): Oncorhynchus mykiss (previous name: Salmo gairdneri)
EC50 - Crustacea [1]	> 1.6 mg/l Test organisms (species): Daphnia magna
EC50 72h - Algae [1]	4.5 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)
EC50 72h - Algae [2]	2.8 mg/l Test organisms (species): Desmodesmus subspicatus (previous name: Scenedesmus subspicatus)
NOEC (chronic)	1.7 mg/l Test organisms (species): Ceriodaphnia dubia Duration: '8 d'
BCF - Fish [1]	81 (Pisces)
BCF - Other aquatic organisms [1]	300000 (Mollusca)
BCF - Other aquatic organisms [2]	125000 (Crustacea)

12.2. Persistence and degradability

Iron (7439-89-6)	
Persistence and degradability	Biodegradability in soil: not applicable. Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

Manganese (7439-96-5)	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable

12.3. Bioaccumulative potential

Iron (7439-89-6)	
Bioaccumulative potential	No bioaccumulation data available.

Manganese (7439-96-5)	
BCF - Fish [1]	81 (Pisces)
BCF - Other aquatic organisms [1]	300000 (Mollusca)
BCF - Other aquatic organisms [2]	125000 (Crustacea)
Bioaccumulative potential	No bioaccumulation data available.

12.4. Mobility in soil

Iron (7439-89-6)	
Surface tension	Not applicable (solid)
Ecology - soil	Adsorbs into the soil.

Manganese (7439-96-5)	
Ecology - soil	No (test)data on mobility of the substance available.

12.5. Other adverse effects

Ozone : Not classified
Other adverse effects : No data available

13. Disposal considerations

13.1. Disposal method

Dispose of contents/container in accordance with licensed collector's sorting instructions.

13.2. Disposal precaution

No data available

14. Transport information

UN RTDG	ADR	IMDG	IATA
14.1. UN number			
Not regulated	Not applicable	Not regulated	Not regulated
14.2. UN proper shipping name			
Not regulated	Not applicable	Not regulated	Not regulated
14.3. Transport hazard class(es)			
Not regulated	Not applicable	Not regulated	Not regulated
14.4. Packing group			
Not regulated	Not applicable	Not regulated	Not regulated
14.5. Marine pollutant			
Not regulated	Not applicable	Not regulated	Not regulated

UN RTDG	ADR	IMDG	IATA
No supplementary information available			

14.6. Special precautions for user

No data available

15. Regulatory information

15.1. Occupational Safety and Health Act

Hazardous Substances Prohibited for Manufacturing	Not applicable	
Hazardous Substances Requiring Permission	Not applicable	
Threshold Limit Values Chemicals	Applicable	7439-89-6: Iron salts (Soluble, as Fe) 7439-96-5: Manganese&Inorganic compounds, as Mn
Hazardous Substances Below Permissible Level	Applicable	7439-96-5: Manganese and its inorganic compounds
Hazardous Substances Subject to Working Environment Measurement	Applicable	7439-96-5: Manganese and its inorganic compounds
Hazardous Substances Subject to Workers Requiring Health Examination	Applicable	7439-96-5: Manganese and its inorganic compounds
Hazardous Substances Subject to Control	Applicable	7439-89-6: Iron and its compounds 7439-96-5: Manganese and its inorganic compounds
Substance Subject to Submission of PSM	Not applicable	

15.2. Chemicals Control Act

Toxic Substances	Not applicable
Prohibited Substances	Not applicable
Restricted Substances	Not applicable
Substances Requiring Preparation for Accident	Not applicable

15.3. ACT ON REGISTRATION, EVALUATION, ETC. OF CHEMICALS (K-REACH)

Korea Existing Chemicals Inventory (KECI)(MOE, Korea)	Applicable	7439-89-6: Iron (KECI-No. : KE-21059) 7439-96-5: Manganese (KECI-No. : KE-22999)
Priority Existing Chemicals (MOE, Korea)	Not applicable	
Substances Subject to Intensive Control	Not applicable	
CMR Substances	Not applicable	

15.4. Safety Control of Dangerous Substances Act

Safety Control of Dangerous Substances Act	Applicable	7439-89-6: Iron powder (Class 2 Combustible solid - category 4 Iron Powder (Designated quantity: 500kg)) 7439-96-5: Manganese powder (Class 2 Combustible solid - category 5 Metal powder (Designated quantity: 500kg))

15.5. Wastes Control Act

Hazardous Substances in Designated wastes	Not applicable
Types of wastes	No data available

15.6. Other Domestic and International Regulatory Information

Domestic

Persistent Organic Pollutants(POPs) Control Act	Not applicable
Ozone Depleting Substances(ODS)	Not applicable

International

EU Regulatory Information

EU Candidate list (SVHC)	Contains no substance on the REACH candidate list
EU authorization list (REACH Annex XIV)	Contains no REACH Annex XIV substances
EU restriction list (REACH Annex XVII)	Not applicable

US Regulatory Information

CERCLA Section 103 (40CFR302.4)	Not applicable
EPCRA Section 302 (40CFR355.30)	Not applicable
EPCRA Section 304 (40CFR355.40)	Not applicable
EPCRA Section 313 (40CFR372.65)	Contains listed substances

International agreements

No data available

16. Other information

16.1. Data sources: 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,Classification according to Classification, Labelling and Packaging of Substances and Mixtures (SEA) Regulation published in the Official Journal numbered 28848 on December 11, 2013,Supplier's safety documents,No data available,This safety data sheet was compiled with data and information from the following sources : RTECS, ECOSAR, HSDB, SIDS SIAP, ChemWATCH, CESAR, Chemical DB,ECHA (European Chemicals Agency),This MSDS is prepared based on KOSHA, NITE, ESIS, NLM, SIDS, IPCS, NCIS, etc,This MSDS is prepared based on Article 41 of the Occupational Safety and Health Act and Notice No.2016-19 of the Ministry of Employment and Labor (based on the availability of material safety and health data), taking into account the status of regulations related to Korea.

16.2. Issue date: 6/28/1996

16.3. Revision number and date: 6.1, 04/03/2024

16.4. Other information: No data available

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.