1. IDENTIFICATION OF SUBSTANCE / PREPARATION AND OF THE COMPANY

Product Name	**Certified by Technical Association of Refractories, Japan Standard Reference Materials for XRF Analysis Chrome-magnesia refractories Series (Class I) JRRM500 Series(501,502,503,504,505,506,507,508,509,510,511,512) 12 piece/set**
Manufacturer	**The Technical Association of Refractories, Japan**
Address	**New Ginza Bldg.,7-3-13,Ginza,Chuo-ku,Tokyo 104-0061, Japan**
Phone number	**+81-3-3572-0705**
Fax number	**+81-3-3572-0175**
Distributer	**SEISHIN TRADING CO., LTD.**
Address	**1-4-4, Minatojima-Minamimachi, Chuo-ku, Kobe 650-0047, Japan**
Phone number	**+81-78-303-3810**
Fax number	**+81-78-303-3822**
Emergency phone number	**+81-3-3572-0705**
E-mail	**taigikyou@tarj.org**
Recommended use of the chemical and restriction on use	**This material is used as standard material for calibration curve, standardized sample, sample for analytical accuracy test etc in X-ray fluorescence analysis. This series of standard substances was manufactured for fluorescent X-ray analysis by the glass bead method. When using this product under other uses or under special conditions, please be evaluated and take the best safety measures under your own responsibility.**

2. HAZARDS IDENTIFICATION

GHS classification

Physical Hazards	**Flammable solids**	**Not classified**
	Pyrophoric solids	**Not classified**
	Self-heating substances and mixtures	**Not classified**
	Substances and mixtures, which in contact with water, emit flammable gases	**Not classified**
	Oxidizing solids	**Not classified**
Health Hazards	**Acute toxicity (oral)**	**Not classified**
	Acute toxicity (dermal)	**Not classified**
	Acute toxicity (inhalation: dust, mist)	**Not classified**
	Skin corrosion/irritation	**Category 2**
	Serious eye damage/eye irritation	**Category 1**
	Skin/Respiratory sensitizer	**Category 1**
	Germ cell mutagenicity	**Category 1B**
	Carcinogenicity	**Category 1A**

2. HAZARDS IDENTIFICATION

	Specific target organ systemic toxicity (single exposure)	Category 2(respiratory system) Category 3(respiratory tract irritation)
	Specific target organ systemic toxicity (repeated exposure)	Category 1(respiratory system and lung)
Environmental Hazards	Acute hazards to the aquatic environment	Category 1
	Chronic hazards to the aquatic environment	Category 1

*** Unstated information is either 'classification not possible or 'not applicable'**

Pictogram or Symbol

Signal word Danger

Hazard Statement

H315: Causes skin irritation

H317: May cause an allergic skin reaction

H318: Causes serious eye damage

H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled

H335: May cause respiratory irritation

H340: May cause genetic defects

H350: May cause cancer

H371: May cause damage to respiratory system

H372: Causes damage to lung and respiratory system through prolonged or repeated exposure

H410: Very toxic to aquatic life with long lasting effects

<Prevention>

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.

P264: Wash hands thoroughly after handling.

P270: Do not eat, drink or smoke when using this product.

P271: Use only outdoors or in a well-ventilated area.

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.

2. HAZARDS IDENTIFICATION

	P284: [In case of inadequate ventilation] wear respiratory protection.
<Response>	**P302+P352: IF ON SKIN: Wash with plenty of water/...**
	P304+P340: IF INHALED: Remove person to fresh air and comfortable for breathing.
	P305+P351+P338: IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
	P308+P313: IF exposed or concerned: Get medical advice/attention.
	P310: Immediately call a POISON CENTER/doctor/...
	P314: Get Medical advice/attention if you feel unwell.
	P333+P313: If skin irritation or a 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.
	P391: Collect spillage.
<Storage>	**P403+P233: Store in a well ventilated place. Keep container tightly closed.**
	P405: Store locked up.
<Disposal>	**P501: Dispose of contents/container to in accordance with local regulations and statutory provisions.**

3. COMPOSITION / INFORMATION ON INGREDIENTS

Substance/Mixture **Mixture**

Chemical identity	CAS-No	Concentration (%)	EC-No	Hazard statement Codes
Magnesium oxide	1309-48-4	10 - 88	215-171-9	-
Chromium (III) oxide	1308-38-9	2.8 – 53	215-160-9	H317, H334, H400, H410
Amorphous silica	112926-00-8	0.9 – 11	-	-
Aluminium oxide	1344-28-1	2.9 – 30	215-691-6	H335, H372
Diiron trioxide	1309-37-1	1 - 27	215-168-2	H315, H318, H335, H372
Titan oxide	13463-67-7	0 – 1.2	236-675-5	H320, H335, H372
Calcium oxide	1305-78-8	0 – 4.0	215-138-9	H315, H318, H370, H372
Manganese oxide(MnO)	1344-43-0	0 – 0.2	215-695-8	-
Divanadium pentaoxide	1314-62-1	0 – 0.2	215-239-8	H410

The type (chemical formula) of the crystal in the standard substance (10 species) was identified by X-ray diffraction method. Periclase (crystal chemical formula MgO) exists in all standard substances. Chromium oxide exists as $MgCr_2O_4$, $Mg(Al, Cr)_2O_4$ or the like.

4. FIRST AID MEASURES

If inhaled:	**If inhaled plenty of dust, immediately remove victim to fresh air. If the victim shows breathing abnormality, immediately get medical advice/attention.**

4. FIRST AID MEASURES

If on skin:	**Wash with soap and water.**
If in eyes:	**If dust contact with eyes, immediately rinse with clean water or eyewash. If abnormality persists, get medical advice/attention.**
If swallowed:	**Rinse mouth with water. Immediately get medical advice/attention.**

5. FIRE FIGHTING MEASURES

Suitable extinguishing media:	**The product is not flammable. Use extinguishing media appropriate to surrounding fire conditions.**
Unsuitable extinguishing media:	**No information**
Specific hazards arising from the chemical:	**Nothing particular**
Special precautions for fire-fighters:	**Nothing particular**
Firefighters equipment:	**Firefighters should wear proper protective equipment.**

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:	**Avoid raising dust during a process and recover it. Wear proper protective equipment and avoid contacting dust with eyes and skin and inhaling dust.**
Environmental precautions:	**Nothing particular**

7. HANDLING & STORAGE

Advice on safe handling:	**Wear a dust respirator, safety glasses and so one, as appropriate. Avoid collapse and dropping of the goods.**
Storage conditions:	**Store indoors, way from water.**

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits:

ACGIH	**TWA**	**10 mg/m^3 (aluminum oxide)**
	TWA	**5 mg/m^3 (diiron trioxide)**
	TWA	**10 mg/m^3 (titan oxide)**
	TWA	**2 mg/m^3 (calcium oxide)**
	TWA	**0.05 mg/m^3 (divanadium pentaoxide)**
	TWA	**0.5 mg/m^3 (chromium (III) compound, as Cr))**

Appropriate engineering controls:	**To keep below exposure limit, make available local exhaust ventilation if necessary.**

Individual protection measures:

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory protection:	**When above exposure limit, use a dust respirator, if ventilation is judged to be insufficient.**
Hand protection:	**Wear protective gloves.**
Eye protection:	**Wear dust goggles, if necessary.**
Skin and body protection:	**Wear long sleeve clothes to protect skin.**
Hygiene measures:	**Wash hands after handling.**

9. PHYSICAL & CHEMICAL PROPERTIES

Physical form, color etc:	**Powder / White or light brown**
Odor:	**No odor**
pH:	**No data, insoluble in water**
Melting point:	**No data**
Boiling point, Flash point, Auto-ignition point:	**Not flammable solids**
Specific gravity:	**No data**
Solubility:	**Insoluble in organic solvents and water**

10. STABILITY & REACTIVITY

Stability:	**Stable under normal conditions.**
Possibility of hazardous reactions:	**React with acids and hydrogen fluoride.**
Conditions to avoid:	**Nothing particular**
Material to avoid:	**Strong acids and hydrogen fluoride.**
Hazardous decomposition products:	**Nothing**

11. TOXICOLOGICAL INFORMATION

GHS classification was performed by the data of a pure substance, because tested data as a mixture is not available.
As reference, data of each ingredient are shown below.

Acute toxicity (Oral)	**Based on the testing data of rat LD50 (oral route) of 10mg/kg (CERI Hazard Data 2000-49, 2001).(Category 2) (divanadium pentaoxide)**
Acute toxicity (Inhalation: Dusts and mists)	**Based on the testing data of rat LC50 (4 hour inhalation exposure) of 4.29mg/L (IUCLID, 2000).(Category 4) (divanadium pentaoxide)**
Skin corrosion/Irritation:	**Corrosivity on skin , very irritating to damp skin, and UN classification class 8-III(Category 1C).(Calcium oxide)**
	Redness and moderate irritation on humans. (Category 2) (diiron trioxide)

11. TOXICOLOGICAL INFORMATION

Serious eye damage / eye irritation	**Corrosive to eye, and corrosion of the skin(Category 1C).(Calcium oxide)**
	Corrosive in humans. (Category 1) (diiron trioxide)
	Mild by rabbit test. (Category 2B) (titanium dioxide)
	Based on the evidence of "moderate irritation" from rabbit eye irritation tests (RTECS, 2004).(Category 2A) (divanadium pentaoxide)
	Rabbit; Mild conjunctival stimulation(Category 2B)(amorphous silica)
Respiratory sensitizer	**Chromium is classified into ‘‘Respiratory Sensitizing Substance’’ by the ad hoc committee of the Japanese Society of Occupational Allergy, and ‘‘Respiratory Sensitizing Substance: Group 2’’* by the Japan Society for Occupational Health. These classifications, through not specifying chromium (III) oxide, seem to include chromium compounds. (Category 1) (Chromium (III) oxide)**
Skin sensitizer	**Chromium is classified into ‘‘Skin Sensitizing Substance’’ by the ad hoc committee of the Japanese Society of Occupational Allergy, and ‘‘Skin Sensitizing Substance: Group 1’’* by the Japan Society for Occupational Health. These classifications, though not specifying chromium (III) oxide, seem to include chromium compounds. (Category 1) (Chromium (III) oxide)**
Germ cell mutagenicity	**Based on positive data on heritable mutagenicity tests (dominant lethal tests), described in CICAD 29 (2001). (Category 1B)(divanadium pentaoxide)**
Carcinogenicity	**Due to the fact that the substance is classified as Group 2B by IARC (2005, in preparation).(Category 2) (divanadium pentaoxide)**
Reproductive toxicity	**Based on the evidence of adverse effects on male fertility and foetal development at dosing levels toxic to parent animals, described in CICAD 29 (2001) and NTP TR507 (2002). (Category 2) (divanadium pentaoxide)**
Specific target organs/systemic toxicity following single exposure	**Upper respiratory irritation (Category 3, respiratory tract irritation) (aluminum oxide)**
	respiratory irritation (Category 3, respiratory tract irritation) (silica gel)
	There is a statement that the inflammation of a respiratory tract (ACGIH (2001)) and pneumonitis (HSDB (2005)) are caused from dust inhalation and it was set as category 1 (respiratory systems), and if it drinks by mistake, a pulse will be quick and will become weak, breathing is quick and becomes shallow, body temperature falls, it becomes difficult to breathe by cancer of glottis, and will be in a shock states. There is the description which also produces esophageal, the stomach perforation (HSDB (2005)), but it was Priority2, it classified into Category 2 (whole body toxicity, digestive organ).(Calcium oxide)

11. TOXICOLOGICAL INFORMATION

	The coughing and also closeness were seen in humans (Category 3) (diiron trioxide) **Based on the human evidence including "severe upper respiratory irritation, upper respiratory damage, asthma, bloody phlegm, anemia, an increase in white blood cell counts, albuminuria, urinary casts, bloody urine and tremor" (CERI Hazard Data 2000-49, 2001) and the evidence from animal studies including "pulmonary edema" (CERI Hazard Data 2000-49, 2001) and "watery eyes, diarrhea, hepatocyte necrosis and swelling of renal tubules" (CICAD 29, 2001). The substance was classified as Category 1 instead of Category 3 (Respiratory Irritation), based on the human evidence of "severe upper respiratory irritation". The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1. (divanadium pentaoxide)**
Specific target organs/systemic toxicity following repeated exposure	**By occupational exposure of aluminas, pulmonary fibrosis was occurred. (Category 1, lung) (aluminum oxide)** **It was classified into Category 1 (respiratory systems) according to the statement of ulcers and perforations of nasal septum (ACGIH (2001)), and (ICSC (1997)).(Calcium oxide)** **Although abnormalities are found on a chest x-rays test in humans, it is clinically satisfactory, and if it accumulates in lungs, it will become siderosis, but it is benign and does not progress to fibrosis. Metal fevers may be occurred by exposure.(Category 1, respiratory system) (diiron trioxide)** **Pneumoconiosis changes became clear by x-ray test, although not accompanied by change of the lung function of very few of the laborers with occupational exposure for 20 years or more. (Category 1, lung) (titanium dioxide)** **Based on the human evidence including "cough, bronchitis, serious respiratory irritation, a few cases of abnormal hemoglobin levels (details not available), palpitation, debility and nervous asthenia" (CERI Hazard Data 2000-49, 2001) and the evidence from animal studies including "nasal hemorrhage, nasal secretion, focal pulmonary edema, fatty degeneration associated with focal necrosis of hepatocytes" (CERI Hazard Data 2000-49, 2001). The effects on experimental animals were observed at dosing levels within the guidance value ranges for Category 1. (divanadium pentaoxide)** **Although abnormalities are found on a chest x-rays test in humans, it is clinically satisfactory, and if it accumulates in lungs, it will become siderosis, but it is benign and does not progress to fibrosis. Metal fevers may be occurred by exposure.(Category 1, respiratory system) (diiron trioxide)**

11. TOXICOLOGICAL INFORMATION

	Rat; Interstitial pneumonia and hyperplasia of the alveolar septum(Category 1(respiratory system))(Chromium (III) oxide)
Aspiration hazard	**Category 1 because of "aspiration pneumonia to human beings."(HSDB, 2005)(Calcium oxide)**

12. ECOLOGICAL INFORMATION

Hazardous to the aquatic environment (acute)	**It was classified into Category 2 from 48 hours LC50=1.45mg/L of the crustacea (Daphnia magna) (CERI Hazard Data, 2002).(Category 2)(divanadium pentaoxide)**
	Crustacea sp. (Daphnia magna) LC50(48hrs)=0.162mg/L (Category 1)(Chromium (III) oxide)
Hazardous to the aquatic environment (chronic)	**Relevant toxicity is not indicated in the water solubility, but being metal compound, its behavior in water is uncertain.(Category 4) (titanium dioxide)**
	Although acute toxicity was Category 2 and bio-accumulation was low (BCF=14 (Existing Chemical Safety Inspections Data)), since it was a metallic compound and the underwater action was unknown, it was classified into Category 2. (divanadium pentaoxide)
	Being metal compound, its behavior in water and bio-accumulative potential are uncertain. Acute toxicity is classified into Category 1. (Category 1)(Chromium (III) oxide)

13. DISPOSAL CONSIDERATIONS

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

Waste must be sent to an approved incinerator or disposed in an approved waste facility.

14. TRANSPORT INFORMATION

National regulations

Ground regulation information:	**Not regulated**
Maritime regulation information:	**Non-hazardous material**

Prevent exposure to water and collapse of cargo in freight transport.

United Nations number:	**-**
UN Proper shipping name:	**-**
Transport Hazard class:	**-**
Packing group, if applicable:	**-**
Marine pollutant (Y/N):	**Not applicable**

15. REGULATORY INFORMATION

15. REGULATORY INFORMATION

International Inventories

EINECS/ELINCS Listed

TSCA Listed

Japanese regulations

ISHA: Chemical Substances requiring Labeling and Deliver of Documents, etc.

Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof: Classification I, Chromium and chromium(III) compounds(Cabinet Order Number 1-87)

Water Pollution Control Law: Designated Substances, Aluminium and its compounds(Article 3-3-44 of Cabinet order)

16. OTHER INFORMATION

This information is based on our present state of knowledge and is intended to describe our products from the point of view of the safety requirements. It should not be construed as guaranteeing specific properties.

End of SDS