



JP CONSULTANCY & ENGINEERING SDN BHD (884518-A)

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MATERIAL SAFETY DATA SHEET

JP™ Titanium Putty - Hardener

1. IDENTIFICATION

Product Identifier

JP TITANIUM PUTTY - Hardener

Company Name

JP Consultancy and Engineering Sdn Bhd

Recommended use of the chemical and restrictions on use

Relevant identified uses: Hardener component of two-part epoxy putty.

Additional Information

2. HAZARD IDENTIFICATION

Classification of the substance/mixture Acute

Toxicity - Oral: Category 4

Eye Damage/Irritation: Category 1

Sensitization - Skin: Category 1

STOT Repeated Exposure: Category 1

STOT Single Exposure: Category 3 (respiratory tract irritation)

Signal Word (s)

DANGER

Hazard Statement (s)

H302 Harmful if swallowed.

H312 Harmful in contact with skin.

H314 Causes severe skin burns and eye damage.



H317 May cause an allergic skin reaction.

H341 Suspected of causing genetic defects.

H413 May cause long lasting harmful effects to aquatic life.

Precautionary Statement (s)

P101 If medical advice is needed, have product container or label at hand.

P102 Keep out of reach of children.

P103 Read label before use.

Pictogram (s)

Corrosion, Exclamation mark, Health hazard



Precautionary statement – Prevention

P201 Obtain special instructions before use.

Precautionary statement – Response

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously 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.

Precautionary statement – Storage

P405 Store locked up.

Precautionary statement – Disposal

P501 Dispose of contents/container in accordance with local regulations.

Other Information

Classification [1]: Acute Toxicity (Oral) Category 4, Acute Toxicity (Dermal) Category 4, Skin Corrosion/Irritation Category 1B, Serious Eye Damage Category 1, Skin Sensitizer Category 1, Germ cell mutagenicity Category 2, Chronic Aquatic Hazard Category 4

Legend: 1. Classified by; 2. Classification drawn from HSIS; 3. Classification drawn from EC Directive 1272/2008 - Annex VI

3. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredients

Name	CAS	Proportion
Triethylenetetramine	112-24-3	1-10 %weight
2-ethyl-4-methylimidazole	931-36-2	1-5 %weight
Phenol	108-95-2	1-5 %weight

Other Information

Substances:

See section below for composition of Mixtures



4. FIRST-AID MEASURES

Inhalation

If fumes or combustion products are inhaled remove from contaminated area.

Lay patient down. Keep warm and rested.

Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.

Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.

Transport to hospital, or doctor.

Ingestion

For advice, contact a Poisons Information Centre or a doctor at once.

Urgent hospital treatment is likely to be needed.

If swallowed do NOT induce vomiting.

If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.

Observe the patient carefully.

Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.

Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.

Transport to hospital or doctor without delay.

Skin

If skin contact occurs:

Immediately remove all contaminated clothing, including footwear.

Flush skin and hair with running water (and soap if available).

Seek medical attention in event of irritation.

Eye contact

If this product comes in contact with the eyes:

Immediately hold eyelids apart and flush the eye continuously with running water.

Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.

Transport to hospital or doctor without delay.

Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

Indication of immediate medical attention and special treatment needed if necessary

As in all cases of suspected poisoning, follow the ABCDEs of emergency medicine (airway, breathing, circulation, disability, exposure), then the ABCDEs of toxicology (antidotes, basics, change absorption, change distribution, change elimination).

For poisons (where specific treatment regime is absent):

----- BASIC TREATMENT -----

Establish a patent airway with suction where necessary.

Watch for signs of respiratory insufficiency and assist ventilation as necessary.

Administer oxygen by non-rebreather mask at 10 to 15 L/min.

Monitor and treat, where necessary, for pulmonary oedema.

Monitor and treat, where necessary, for shock.

Anticipate seizures.

DO NOT use emetics. Where ingestion is suspected rinse mouth and give up to 200 ml water (5 ml/kg recommended) for dilution where patient is able to swallow, has a strong gag reflex and does not drool.

----- ADVANCED TREATMENT -----

Consider orotracheal or nasotracheal intubation for airway control in unconscious patient or where respiratory arrest has occurred.

Positive-pressure ventilation using a bag-valve mask might be of use.

Monitor and treat, where necessary, for arrhythmias.

Start an IV D5W TKO. If signs of hypovolaemia are present use lactated Ringers solution. Fluid overload might create complications.

Drug therapy should be considered for pulmonary oedema.

Hypotension with signs of hypovolaemia requires the cautious administration of fluids. Fluid overload might create complications.

Treat seizures with diazepam.



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Proparacaine hydrochloride should be used to assist eye irrigation.

BRONSTEIN, A.C. and CURRANCE, P.L.

EMERGENCY CARE FOR HAZARDOUS MATERIALS EXPOSURE: 2nd Ed. 1994



5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Foam.

Dry chemical powder.

BCF (where regulations permit).

Carbon dioxide.

Specific Methods

Alert Fire Brigade and tell them location and nature of hazard.

Wear full body protective clothing with breathing apparatus.

Prevent, by any means available, spillage from entering drains or water course.

Use water delivered as a fine spray to control fire and cool adjacent area.

Specific Hazards Arising from The Chemical

Fire Incompatibility:

Avoid contamination with oxidizing agents i.e., nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Fire/Explosion Hazard:

Combustible.

Slight fire hazard when exposed to heat or flame.

Heating may cause expansion or decomposition leading to violent rupture of containers.

On combustion, may emit toxic fumes of carbon monoxide (CO).

Combustion products include:

carbon dioxide (CO₂)

nitrogen oxides (NO_x)

other pyrolysis products typical of burning organic material.

May emit poisonous fumes.

May emit corrosive fumes.

Decomposition Temperature

Not Available

6. ACCIDENTAL RELEASE MEASURES

Clean-up Methods - Small Spillages

Environmental hazard - contain spillage.

Slippery when spilt.

Remove all ignition sources.

Clean up all spills immediately.

Avoid breathing vapors and contact with skin and eyes.

Control personal contact with the substance, by using protective equipment.

Clean-up Methods - Large Spillages

Environmental hazard - contain spillage.

Slippery when spilt.

Moderate hazard.

Clear area of personnel and move upwind.

Alert Fire Brigade and tell them location and nature of hazard.

Wear breathing apparatus plus protective gloves.

Other Information

Personal Protective Equipment advice is contained in Section 8 (EXPOSURE CONTROLS/PERSONAL PROTECTION) of the MSDS.



7. HANDLING AND STORAGE

Precautions for Safe Handling

Safe handling:

DO NOT allow clothing wet with material to stay in contact with skin

Avoid all personal contact, including inhalation.

Wear protective clothing when risk of exposure occurs.

Use in a well-ventilated area.

Prevent concentration in hollows and sumps.

Other information:

Store in original containers.

Keep containers securely sealed.

No smoking, naked lights or ignition sources.

Store in a cool, dry, well-ventilated area.

Conditions for safe storage, including any incompatibilities

Suitable container:

Metal can or drum

Packaging as recommended by manufacturer.

Check all containers are clearly labelled and free from leaks.

Storage incompatibility:

Avoid strong acids, acid chlorides, acid anhydrides and chloroformates.

Avoid reaction with oxidizing agents

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure limit values

Control parameters:

OCCUPATIONAL EXPOSURE LIMITS (OEL):

INGREDIENT DATA:

Source: Australia Exposure Standards

Ingredient: phenol

Material name: Phenol

TWA: 4 mg/m³ / 1 ppm

STEL: Not Available

Peak: Not Available

Notes: Not Available

EMERGENCY LIMITS:

Ingredient: triethylenetetramine

Material name: Triethylenetetramine

TEEL-1: 3 ppm

TEEL-2: 14 ppm

TEEL-3: 83 ppm

Ingredient: phenol

Material name: Phenol

TEEL-1: Not Available

TEEL-2: Not Available

TEEL-3: Not Available

Ingredient: triethylenetetramine

Original IDLH: Not Available

Revised IDLH: Not Available

Ingredient: 2-ethyl-4-methylimidazole



Original IDLH: Not Available

Revised IDLH: Not Available

Ingredient: phenol

Original IDLH: 250 ppm

Revised IDLH: 250 [Unch] ppm

Appropriate Engineering Controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.

The basic types of engineering controls are:

Process controls which involve changing the way a job activity or process is done to reduce the risk.

Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment.

Refer also to protective measures for the other component used with the product. Read both SDS before using; store and attach SDS together.

Respiratory Protection

Type AK-P Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Eye Protection

Chemical goggles.

Full face shield may be required for supplementary but never for primary protection of eyes.

Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task.

Hand Protection

Wear chemical protective gloves, e.g. PVC.

When handling corrosive liquids, wear trousers or overalls outside of boots, to avoid spills entering boots.

NOTE:

The material may produce skin sensitization in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact.

Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed.

The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.

The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and has to be observed when making a final choice.

Personal hygiene is a key element of effective hand care.

Thermal Hazards

Not Available

Footwear

Wear safety footwear or safety gumboots, e.g. Rubber

Body Protection

Overalls.

P.V.C. apron.

Barrier cream.

9. PHYSICAL AND CHEMICAL PROPERTIES

Form

Paste

Appearance

White / off white paste with amine odor; slightly soluble in water.

Odor

Sulphury Odor

Decomposition Temperature

Not Available



Solubility in Water

Partly miscible

pH

Not Available (as supplied)

9.75 conc. soln. (as a solution (1%))

Vapor Pressure

Negligible

Vapor Density (Air=1)

Not Available

Evaporation Rate

Not Available

Physical State

Liquid

Odor Threshold

Not Available

Viscosity

Not Available

Volatile Component

Not Applicable

Partition Coefficient: n-octanol/water

Not Available

Surface tension

Not Available

Flash Point

136°C

Flammability

Not Applicable

Auto-Ignition Temperature

Not Available

Explosion Limit - Upper

Not Available

Explosion Limit - Lower

Not Available

Explosion Properties

Not Available

Molecular Weight

Not Applicable

Oxidizing Properties

Not Available

Initial boiling point and boiling range

>177°C

Relative density

1.78 (Water = 1)

Melting/Freezing Point

Not Available

Other Information

Taste: Not Available

Gas group: Not Available

VOC g/L: Not Available



10. STABILITY AND REACTIVITY

Reactivity

See section 7 (HANDLING AND STORAGE)

Chemical Stability

Unstable in the presence of incompatible materials.

Product is considered stable.

Hazardous polymerization will not occur.

Conditions to Avoid

See section 7 (HANDLING AND STORAGE)

Incompatible materials

See section 7 (HANDLING AND STORAGE)

Hazardous Decomposition Products

See section 5 (FIREFIGHTING MEASURES)

Possibility of hazardous reactions

See section 7 (HANDLING AND STORAGE)

11. TOXICOLOGICAL INFORMATION

Toxicology Information

JP Titanium Putty Hardener

TOXICITY: Not Available

IRRITATION: Not Available

Triethylenetetramine

TOXICITY:

Dermal (rabbit) LD50: 805 mg/kg[2]

Oral (rat) LD50: 2500 mg/kg[2]

IRRITATION:

Eye (rabbit): 20 mg/24 h - moderate

Eye (rabbit); 49 mg - SEVERE

Skin (rabbit): 490 mg open SEVERE

Skin (rabbit): 5 mg/24 SEVERE

2-ethyl-4-methylimidazole

TOXICITY:

Inhalation (rat) LC50: >21.2 mg/l/h *[2]

Oral (rat) LD50: 1180 mg/kg[2]

IRRITATION: Not Available

Phenol

TOXICITY:

dermal (rat) LD50: 525 mg/kg[1]

Inhalation (rat) LC50: 0.000316 mg/L/4H[2]

Oral (rat) LD50: 317 mg/kg[2]

IRRITATION:

Eye(rabbit): 100 mg rinse - mild

Eye(rabbit): 5 mg - SEVERE

Skin(rabbit): 500 mg open -SEVERE

Skin(rabbit): 500 mg/24hr - SEVERE

Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS.

Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances

TRIETHYLENETETRAMINE:

The following information refers to contact allergens as a group and may not be specific to this product.



Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions.

Ethyleneamines are very reactive and can cause chemical burns, skin rashes and asthma-like symptoms. It is readily absorbed through the skin and may cause eye blindness and irreparable damage. As such, they require careful handling. In general, the low-molecular weight polyamines have been positive in the Ames assay (for genetic damage); however, this is probably due to their ability to chelate copper.

For alkyl polyamines:

The alkyl polyamines cluster consists of two terminal primary and at least one secondary amine groups and are derivatives of low molecular weight ethylenediamine, propylenediamine or hexanediamine. Toxicity depends on route of exposure. Cluster members have been shown to cause skin irritation or sensitization, eye irritation and genetic defects, but have not been shown to cause cancer. Triethylenetetramine is a severe irritant to skin and eyes and may induce skin sensitization. Acute exposure to saturated vapor via inhalation was tolerated without impairment but exposure to aerosol may lead to reversible irritations of the mucous membranes in the airways. Studies done on experimental animals showed that it does not cause cancer or foetal developmental defects. Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

PHENOL:

The substance is classified by IARC as Group 3:

NOT classifiable as to its carcinogenicity to humans.

Evidence of carcinogenicity may be inadequate or limited in animal testing.

TRIETHYLENETETRAMINE & PHENOL:

The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

TRIETHYLENETETRAMINE & PHENOL:

The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.

TRIETHYLENETETRAMINE & 2-ETHYL-4-METHYLIMIDAZOLE & PHENOL:

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia.

Acute Toxicity: Data required to make classification available

Ingestion

Accidental ingestion of the material may be harmful; animal experiments indicate that ingestion of less than 150 gram may be fatal or may produce serious damage to the health of the individual.

The material can produce chemical burns within the oral cavity and gastrointestinal tract following ingestion.

Strong evidence exists that this substance may cause irreversible mutations (though not lethal) even following a single exposure.

Inhalation

Inhalation of aerosols (mists, fumes), generated by the material during the course of normal handling, may be damaging to the health of the individual.

Inhalation hazard is increased at higher temperatures.

Inhalation of amine vapors may cause irritation of the mucous membrane of the nose and throat, and lung irritation with respiratory distress and cough. Swelling and inflammation of the respiratory tract is seen in serious cases; with headache, nausea, faintness and anxiety.

Skin

Skin contact with the material may be harmful; systemic effects may result following absorption.

The material can produce chemical burns following direct contact with the skin.

Entry into the blood-stream, though, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.

Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitization dermatitis in predisposed individuals.

Cutaneous reactions include erythema, intolerable itching and severe facial swelling.



Eye

The material can produce chemical burns to the eye following direct contact. Vapors or mists may be extremely irritating. Vapors of volatile amines irritate the eyes, causing excessive secretion of tears, inflammation of the conjunctiva and slight swelling of the cornea, resulting in "halos" around lights. This effect is temporary, lasting only for a few hours. However, this condition can reduce the efficiency of undertaking skilled tasks, such as driving a car. Direct eye contact with liquid volatile amines may produce eye damage, permanent for the lighter species.

Skin corrosion/irritation

Skin contact with the material may be harmful; systemic effects may result following absorption. The material can produce chemical burns following direct contact with the skin.

Amine epoxy-curing agents (hardeners) may produce primary skin irritation and sensitization dermatitis in predisposed individuals. Cutaneous reactions include erythema, intolerable itching and severe facial swelling.

Serious eye damage/irritation

Data required to make classification available

Mutagenicity

Data required to make classification available

Respiratory sensitization

Data required to make classification available

Skin Sensitization

Data required to make classification available

Reproductive Toxicity

Data Not Available to make classification

STOT-single exposure

Data Not Available to make classification

STOT-repeated exposure

Data Not Available to make classification

Aspiration Hazard

Data Not Available to make classification

Chronic Effects

Skin contact with the material is more likely to cause a sensitization reaction in some persons compared to the general population. Laboratory (in vitro) and animal studies show, exposure to the material may result in a possible risk of irreversible effects, with the possibility of producing mutation.

There has been some concern that this material can cause cancer or mutations but there is not enough data to make an assessment.

Substance accumulation, in the human body, may occur and may cause some concern following repeated or long-term occupational exposure.

There is some evidence that inhaling this product is more likely to cause a sensitization reaction in some persons compared to the general population.

Exposure to the material for prolonged periods may cause physical defects in the developing embryo (teratogenesis).

Ample evidence exists, from results in experimentation, that developmental disorders are directly caused by human exposure to the material.



12. ECOLOGICAL INFORMATION

Ecotoxicity

Toxicity

NOT AVAILABLE

Ingredient: JP Titanium Putty Hardener

Endpoint: NOT AVAILABLE

Test Duration (hr): NOT AVAILABLE

Effect: Not Available

Value: NOT AVAILABLE

Species: NOT AVAILABLE

BCF: Not Available

Ingredient: triethylenetetramine

Endpoint: NOT AVAILABLE

Test Duration (hr): NOT AVAILABLE

Effect: Not Available

Value: NOT AVAILABLE

Species: NOT AVAILABLE

BCF: Not Available

Ingredient: 2-ethyl-4-methylimidazole

Endpoint: NOT AVAILABLE

Test Duration (hr): NOT AVAILABLE

Effect: Not Available

Value: NOT AVAILABLE

Species: NOT AVAILABLE

BCF: Not Available

Ingredient: phenol

Endpoint: NOT AVAILABLE

Test Duration (hr): NOT AVAILABLE

Effect: Not Available

Value: NOT AVAILABLE

Species: NOT AVAILABLE

BCF: Not Available

On the basis of available evidence concerning either toxicity, persistence, potential to accumulate and or observed environmental fate and behavior, the material may present a danger, immediate or long-term and /or delayed, to the structure and/ or functioning of natural ecosystems.

May cause long-term adverse effects in the aquatic environment.

Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high-water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.

Wastes resulting from use of the product must be disposed of on site or at approved waste sites.

May cause long-term adverse effects in the environment.

DO NOT discharge into sewer or waterways.

Persistence and degradability

Ingredient: triethylenetetramine

Persistence: Water/Soil: LOW

Persistence: Air: LOW

Ingredient: 2-ethyl-4-methylimidazole

Persistence: Water/Soil: HIGH

Persistence: Air: HIGH

Ingredient: phenol

Persistence: Water/Soil: LOW (Half-life = 10 days)



Mobility

Mobility in soil:

Ingredient: triethylenetetramine

Mobility: LOW (KOC = 309.9)

Ingredient: 2-ethyl-4-methylimidazole

Mobility: LOW (KOC = 49.29)

Ingredient: phenol

Mobility: LOW (KOC = 268)

Bioaccumulative Potential

Ingredient: triethylenetetramine

Bioaccumulation: LOW (LogKOW = -2.6464)

Ingredient: 2-ethyl-4-methylimidazole

Bioaccumulation: LOW (LogKOW = 1.6443)

Ingredient: phenol

Bioaccumulation: LOW (BCF = 17.5)

13. DISPOSAL CONSIDERATIONS

Waste Disposal

Product / Packaging disposal:

Recycle wherever possible or consult manufacturer for recycling options.

Consult State Land Waste Management Authority for disposal.

Material may be disposed of by controlled burning in an approved incinerator or buried in an approved landfill.

Prior to disposal in a landfill the material should be mixed with the other component and reacted to render the material inert.

14. TRANSPORT INFORMATION

U.N. Number

None Allocated

UN proper shipping name

None Allocated

Transport hazard class(es)

DG Class : 8

Packing Group

Packing Group III (LTD QTY)

UN Number (Sea Transport)

UN 3259

UN Number (Road Transport)

UN 3259

IMDG Proper Shipping Name

AMINES, SOLID, CORROSIVE, N.O.S.(Triethylenetetramine; Methyl imidazole, 4-)

IMDG Hazard Class

IMDG Class 8

Other Information

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