

# MATERIAL SAFETY DATA SHEET

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## 1. Manufacturer Information:

Product name : ALSET Y4  
Company : Mitsubishi Plastics, Inc.  
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## 2. Summary of hazardous and toxicity

GHS classification : Not applicable to the classification criteria

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## 3. Composition and ingredient

Single or composite product : Composite product  
Chemical name : Aluminum sheet and Nylon 6 film laminate

Nylon 6:

Major ingredient : Nylon 6 approx. 99 %  
Chemical or structural formula : Nylon 6  $[\text{NH}(\text{CH}_2)_5\text{CO}]_n$   
Official gazette serial number : (Chemical Review Law) (7)-357  
CAS number : 25038-54-4  
United Nation classification and UN number:

Not applicable to hazardous material under United Nations definition

Aluminum :(A1100P)

Main ingredient and content:

Ingredient	Content (%)	CAS number
Si	Total( Si +Fe)	7440-21-3
Fe	$\leq 0.95$	7439-89-6
Cu	0.05 ~ 0.20	7440-50-8
Mn	$\leq 0.05$	7439-96-5
Zn	$\leq 0.10$	7440-66-6
Al	$\geq 99.0$	7429-90-5

Chemical or structural formula: Al

Official gazette serial number: (Chemical Review Law, Industrial Hygiene Law) Not applicable

CAS number : As shown above

United Nation classification and UN number: Not applicable to hazardous material under United Nations definition

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#### 4. First aid measures:

If powder or dust is generated during the machining or grinding of product;

Eye contact : If powder or dust gets into eyes, wash with clean water. If pain persists, seek for an eye doctor.

Inhalation : If a large amount of powder or dust is inhaled, immediately remove the patient to fresh air area and keep quiet and warm, then obtain medical help.

If handle the product being heated;

Skin burn : If it is a light burn, immediately cool down the affected position with a large amount of water and if it is a serious burn, seek for medical help immediately.

If the product becomes in chip form which can be swallowed;

When swallowed : Vomit as much as possible. If felt abnormality or swallow a large amount, obtain medical help.

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#### 5. Fire fighting

When only Nylon 6 is burning

Extinguishing method : It is best to extinguish by pouring water. As toxic gas (CO<sub>2</sub>, CO and small amount of HCN, NH<sub>3</sub> etc.) may be generated, the person engaging in the fire fighting should wear fire-proof clothes and self-contained respiration gear.

Extinguishing media : Water, dry chemicals and foam

When ALSET as a whole is burning

Extinguishing method : At the initial stage of fire, cover with incombustible material to shut off oxygen and extinguish by choking with dry sand or extinguishing agent. When and if the fire becomes large, contact fire station for extinguishing.

Extinguishing media : Dry powder, carbon dioxide  
Don't use water or halides.

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#### 6. Accidental release measures

Normally spillage doesn't occur as it is solid but in case high temperature molten product spills, retrieve after cooling down to solidify.

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#### 7. Caution upon handling and storage

Handling : Keep away from fire source.  
Don't touch with bare hand as the edge may cut the hand. When cutting powder is generated, not to accumulate or scatter in the air. Also avoid eye contact or inhalation at the machining.

Storage : Avoid direct sunshine, store at cool and well-ventilated area. Avoid wetting with rain water. Should not be stored in the environment of heat and high humidity. Should not be stored where in contact with chemical substance, such as oil, corrosive gas (Cl, NH<sub>3</sub>, SO<sub>x</sub>, NO<sub>x</sub>, etc.), acid, alkali, and an organic solvent.

Storage place should be flat. If pile up at slanted place, it is not only dangerous but also cargo may break loss.

8. Exposure protection measures

Nylon 6:

Concentration limitation: Not specified (Department of labor Order No.26, March 27, 1995)

Permissible concentration: Japan Industrial Hygiene Institute – Not specified

ACGIH – Not specified

However, it is reasonable to adopt the following values for the dust of Poly-ε-caploamide:

Value of recommended by Japan Industrial Hygiene Institute (94 edition) Class 3 dust:

Average hourly load

Inhaled dust: 2 mg/m<sup>3</sup>

Total dust: 8 mg/m<sup>3</sup>

Recommended value ACGIH (94-95 edition) Ordinary dust:

Inhaled dust: 3 mg/m<sup>3</sup>

Total dust: 10 mg/m<sup>3</sup>

Protective facilities : Appropriate local ventilation facilities are required for the place where dust is generated or noxious gas is generated by the decomposition of resin when fabricated at high temperature.

Protective gears :If appropriated local ventilation is in effect, glass type of goggle should be worn during the normal work.

At the time of work where there is possibility of inhaling vapor or gas such as the cleaning of molding machine or duct, gas musk (for organic gas) and industrial safety goggle should be worn in addition to installing appropriate ventilation facilities. Wear leather gloves when handling molten resin.

Aluminum : (A1100P)

Concentration limitation: Not specified

Permissible concentration: Normally no limitation is needed but if dust or fume is generated, the following limit may be applicable

Subject material	ACGI H TLV	OSHA PEL
Aluminum dust	10.0 mg/m <sup>3</sup>	15.0 mg/m <sup>3</sup> (as whole atmosphere) 5.0 mg/m <sup>3</sup> (inhalation)
Aluminum fume	5.0 mg/m <sup>3</sup>	5.0 mg/m <sup>3</sup>

\* Unspecified exposure limitation means long term work is possible at 8hrs/day x 5 days /week

Notes) ACGH TLV : American Conference of Governmental Industrial Hygienists  
Threshold Limited Value

OSHA PEL : Permissible exposure limit set by Occupational Safety and Health  
Administration of the U.S.

Protective facilities : Normally not necessary but in case of dust or fume is generated and the concentration thereof can not be kept within the value in the above table, local ventilation facilities should be installed.

Protective gears	
Respiration gear	: Normally not required but should be worn if dust, fine chips, lathe dust or powder exists.
Safety glasses	: Should be worn if powder dust or fine chips exist.
Safety gloves	: Wear safety gloves if there is a possibility of hand injury.
Protective clothes	: Prescribed working clothes and safety shoes should be worn.

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## 9. Physical & Chemical properties:

### Nylon 6:

Appearance	: Solid film
Boiling point	: Not applicable
Melting point	: 220~230°C
Specific gravity	: 1.13~1.14
Solubility (water)	: Not soluble
Reactivity (water)	: Not reactive

### Aluminum:

Appearance	: Ductile metal
Boiling point	: 2486°C
Melting point	: 643 ~ 657°C (A1100)
Specific gravity	: 2.71 (A1100)
Solubility (water)	: Not soluble
Reactivity (water)	: Not reactive as solid

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## 10. Hazards identification (Stability & Reactivity)

### Nylon 6:

Ignitability	: 400°C (ASTM-D 1929B)
Combustibility	: Combustible but flame retardant (Oxygen index $\geq 26$ )
Oxidizability	: Not applicable
Stability, reactivity	: Stable at ambient temperature and pressure

### Aluminum:

Ignitability	: Not applicable
Combustibility	: Not applicable
Oxidizability	: In the normal atmosphere, thin natural oxidation membrane protects the surface and no further oxidation takes place
Self-reactivity	: Not applicable
Dust self-explosion	: Apt to explode in the state of dust, especially dangerous if electric discharge source exists.

Stability, reactivity : Stable if rolled product in normal atmosphere. In the state of aluminum powder or fine chips, reaction occurs as follows:

Substances to be reacted	Chemical substance to be formed
Water	Gradually hydrogen and heat are generated.
Heat	Oxidized as the temperature rises.
Acid and alkali	React to generate hydrogen.
Strong oxidizing agent	Generates high temperature with vigorous oxidation.
Halogen compounds	Especially in case of fine aluminum powder, vigorous oxidation occurs.

#### 11. Toxicological information

Nylon 6

Skin inflammation : No knowledge

Irritation (skin, eyes) : No knowledge

Sensitization : No knowledge

Acute toxicity (including 50% fatal dose): No knowledge

Sub acute toxicity : No toxic intoxication was observed when rice gruel-like feed made of mixing 10 % of fine powder of poly  $\epsilon$  caprolactam is freely fed to 30 to 40 heads of male and female rats in growing stage for 8 weeks.

Chronic toxicity : No knowledge

Carcinogen : No knowledge

Mutagen (micro-organism, chromosome): No knowledge

Reproductive toxicity : The reproductive function was normal and no difference was detected between the object animal when rice gruel-like feed made of mixing 10 % of fine powder of poly  $\epsilon$  caprolactam is freely fed to 30 to 40 heads of male and female rats in growing stage for 8 weeks.

Teratogenicity : No knowledge

Others (such as generate toxic gas by reacting with water): None

#### 12. Ecological information

Biodegradability : None

Bioaccumulation : None

Fish toxicity : None

Other information on eco-toxicity : None

#### 13. Caution upon disposal

The method of disposal shall be in accordance with the law, the regulation and the ordinance of the national and the local government regarding the disposal of waste material.

#### 14. Caution upon transportation

Transport with care not to wet by rain water.

Avoid rough handling which may cause cargo break loose.

#### 15. Applicable law

Normally not applicable

If dust is generated

: Labor Safety & Hygiene Law, Lifetime dust Protection regulation (Ministry of Labor Ordinance No. 18, 1979)

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16. Utilization of above information

Literature cited:

- 1) Waste Plastics Q & A by Industrial thermoplastics Technology Exchange Committee
- 2) Exhibited guideline and MSDS for securing safety of aluminum rolled material, by Japan aluminum association
- 3) Aluminum rolled material handbook by Japan aluminum association
- 4) Handbook of aluminum technology, Light Metals Association

The information herein contained is based on the available information presently, but any guarantees are not offered about physical/chemical properties and hazard of products. Also warning is for normal application only and in case of special application, please effect your own safety measures suitable for such uses.

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