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LAMPIRAN

Lampiran 1 Spesifikasi Mesin Injection Molding yang digunakan

JETMASTER MK6

Servo Drive Injection Moulding Machine

	UNITS	JM128-MK6	JM168-MK6	JM258-MK6	JM468-MK6
Injection Unit					
Screw Diameter	mm	36 41 46	41 46 52	46 52 60	75 83 90
Screw L/D Ratio		23.9 21.0 18.7	23.6 21.0 18.6	23.7 21.0 18.2	23.2 21.0 19.4
Screw Stroke	mm	205	230	260	415
Swept Volume	cm ³	209 271 341	304 382 488	432 552 735	1833 2245 2640
Shot Weight(PS)	g	190 246 310	276 348 444	393 502 669	1668 2043 2403
	oz	6.7 8.7 10.9	9.7 12.3 15.7	13.9 17.7 23.6	58.9 72.1 84.7
Injection Pressure (Max.)	kgf/cm ²	2451 1890 1501	2368 1881 1472	2419 1893 1422	2111 1724 1466
Injection Rate	cm ³ /s	104 135 170	138 174 222	169 216 287	442 541 636
	g/s	95 123 155	126 158 202	154 196 261	402 492 579
Screw Rotation Speed (Max.)	rpm	250	224	200	200
CLAMPING UNIT					
Mould Clamping Force (Max.)	t	128	168	258	468
Opening Stroke	mm	380	450	560	820
Space Between Tie Bar (HxV)	mm	410x410	470x470	580x580	830x830
Mould Thickness (Min.- Max.)	mm	150-450	170-520	190-580	300-850
Maximum Daylight	mm	830	970	1140	1670
Ejector Force (Max.)	t	3.4	4.2	6.7	16.6
Ejector Stroke	mm	120	140	150	220
Mould Register Hole	mm	125	125	160	200
Power/Heating Unit					
System Pressure	kgf/cm ²	175	175	175	175
Pump Power	kw	17	22	30	72
Electrical Heating Power	kw	10.6	12.9	16.3	35.5
Temperature Control Zones		3+1	3+1	3+1	5+1
Others					
Machine Dimensions (L*W*H)	m	4.88*1.24*1.82	5.46*1.29*1.89	6.16*1.46*1.94	8.73*2.01*2.24
Oil Tank Capacity	liter	230	270	380	950
Machine Weight (Approx)	t	3.89	4.94	8.6	19.8

JM128-MK6

JM168-MK6

JM258-MK6

JM468-MK6

The Chen Hsong Group
Since 1958

Website : www.chensong.com Email : marketing@chensong.com

* The technical parameters above are for reference only and discrepancies may arise in different circumstances. The company keeps upgrading the products and reserves the right to change the product specifications and parameters without prior notice. The final interpretation to the above specifications and parameters belongs to the company.

Lampiran 2 Material Safety Data Sheet (MSDS) Toyolac Resin

**MATERIAL SAFETY DATA SHEET (MSDS)****“TOYOLAC” MABS Resin****Grade Name : “TOYOLAC” 920 555**

MSDS No. : TPM016

Toray Plastics (Malaysia) Sdn. Bhd.
Date : 15 March, 2010

1. COMPANY / IDENTIFICATION**1.1 NAME OF MANUFACTURER / SUPPLIER**

ADDRESS : 2628 MK.1, SPT., Lorong Perusahaan 4, Prai Free Industrial Zone,
13600 Prai, Penang, Malaysia.

1.2 SAFETY MANAGER**PRODUCTION, TECHNOLOGY**

DIVISION : Production Division
MANAGER : Director & Factory Manager

SALES

DIVISION : Sales & Marketing Division
MANAGER : General Manager

1.3 MSDS MANAGER

DEPT. : Technology Centre
MANAGER : Technology Centre Manager

1.4 INFORMATION CENTER (CUSTOMER SERVICE CENTER)

DEPT. : Sales & Marketing Department
ADDRESS : 2628 MK.1, SPT., Lorong Perusahaan 4, Prai Free Industrial Zone,
13600 Prai, Penang, Malaysia.
Tel. No. : +60-4-3988088
Fax.No. : +60-4-3908975, 39977264

2. COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME : Methylmethacrylate Acrylonitrile Butadiene Styrene Copolymer
GENERIC NAME : MABS Resin
ABBREVIATION NAME : -
SUBSTANCE (O) MIXTURE ()

'TORAY'

CHEMICAL NAME	COMP (%)	CHEMICAL FORMULA (CONSTITUTIONAL FORMULA, STRUCTURAL FORMULA)	CAS No.	TSCA Status
Methylmethacrylate - Acrylonitrile-Butadiene -Styrene Copolymer	100	$-\text{[(C}_5\text{H}_8\text{O}_2)_j-\text{(C}_8\text{H}_8)_k-\text{(C}_3\text{H}_3\text{N)}_l-\text{(C}_4\text{H}_6)_m\text{]}_n-$	9010-94-0	Regd.

3. HAZARDS IDENTIFICATION

Summary of most important information on hazards :
None.

Specific danger/hazard :
None.

4. FIRST-AID MEASURES

Inhalation :

S45-In case of accident or if you feel unwell, seek medical advice immediately (show the label if possible).

S63-In case of accident by inhalation: remove casualty to fresh air and keep him/her at rest. If you breathe too much gas and fume from melting resin, remove casualty to fresh air and keep him/her at rest.

Skin contact :

S45-In case of accident or if you feel unwell, seek medical advice immediately (Show the label if possible).

Rinse with water. If you touch the aggregates of the gas from the melting resin, wash the affected area under water using a mild soap.

Eye contact :

Gently rinse the affected eyes with clean water for at least 15 minutes. Arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible. Have the victim remove contact lenses if he/her is wearing them and continue rinsing. Do not let the victim rub his eyes.

Ingestion :

S45-In case of accident or if you feel unwell, seek medical advice immediately (show the label if possible).

5. FIRE FIGHTING MEASURES

Extinguishing Media :

S43-In case of fire, use water mist, water jet, foam, dry powder, CO₂.

Specific Hazards with regard to Fire-Fighting Measures :

Toxic gases will form upon combustion : carbon monoxide, nitrogen oxides, carbon dioxide etc. Fires involving this material produce large amounts of sooty smoke.



Specific fire-fighting measures :

Apply water from a safe distance to cool and protect surrounding area. Move container from fire areas if it can be done without risk. Keep personnel removed from an upwind of fire. Evacuate non-essential personnel to safe area.

Protection of fire-fighters :

Firefighters should wear proper protective equipment.

6. ACCIDENTAL RELEASE MEASURES

Measures for Handling Personnel :

None.

Measures for environmental effects :

Do not flush to sewer or waterway.

Measures when handling spilled substances :

Sweep up, place in a bag and hold for waste disposal. Consult an expert on the disposal of recovered material.

Preventive measures for secondary accident :

Shut off all sources of ignition; no flares, smoking or flames in area.

7. HANDLING AND STORAGE

Handling :

Preventive measures :

Exposure control for handling personnel :

S21-When using do not smoke.

Protective measures against fire & explosion :

S33-Take precautionary measures against static charges.

Safety treatments :

Prevent deposition of dust.

Safety Measures/Incompatibility :

S29-Do not flush to sewer or drains. Avoid rough handling or dropping. Do not breathe the gas generated by processing, because it stimulates skin and respiratory organs and it is possible to feel unwell if you breathe in too much gas. Prevent deposition of dust, because the dust is possible to explode by static electricity or electric spark.

Storage :

Incompatible storage condition :



S15-Keep away from heat. Keep away heat and sunlight.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures :

Do not use in areas without adequate ventilation.

Adopted value :

Methylmethacrylate-Acrylonitrile-Butadiene-Styrene Copolymer (Japan Association of Industrial Health and Hygiene. Total dust:8mg/m³

Methylmethacrylate-Acrylonitrile-Butadiene-Styrene Copolymer (ACGIH). Total dust:10mg/m³

Neither Japan Association of Industrial Health and Hygiene nor ACGHI specifies the tolerable concentration of ABS resin dust, but it is believed that the above values are reasonable guideline for operation.

Personal protective equipment :

Respiratory protection :

S38-In case of insufficient ventilation, wear suitable respiratory equipment. For most conditions, no respiratory protection should be needed, however, in dusty atmospheres, use an approved dust respirator.

Hand protection :

S37-Wear suitable gloves.

Eye protection :

Wear protective eyeglasses or chemical safety goggles.

Skin and body protection :

S36-Wear suitable protective clothing.

9. PHYSICAL & CHEMICAL PROPERTIES

Physical properties :

Appearance : pellet-shaped solid.

Color : Colorless.

Odor : None.

pH : None.

Phase change temperature :

Melting point : This product gradually becomes soft over a broad range (between 100-150 degree C).

Flash point : N.A.

Ignition temperature : about 405 degree C

Explosion :

Explosion limit Upper : N.A.



Explosion limit Lower : 60g/m^3 (particle size $<0.2\text{mm}$)

Density : $1040\text{-}1090\text{ kg/m}^3$

Solubility :

Solubility in solvent :

Insoluble in water, soluble in organic solvent.

10. STABILITY & REACTIVITY

Stability :

This product is considered a stable material under normal and anticipated storage and handling conditions.

Reactivity :

It has no self-reactivity at the room temperature. Cool the melting resin, because it decomposes and generates gases at high temperature.

Decomposition products :

Toxic fumes of carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Acute toxicity	:	Include 50% Lethal Dose. Oral LD50(Rat) $>5\text{g/kg}$ (assumed value)
Effects on skin, eyes and others	:	It has physical stimulation.
Allergenic and/or sensitizing effects	:	None.
Chronic and/or long term toxicity	:	N.A.
Carcinogenic effects	:	N.A.
Mutagenic effects	:	N.A.
Teratogenic effects	:	N.A.
Toxicity for reproduction	:	N.A.
Others	:	N.A.

12. ECOLOGICAL INFORMATION

Bioaccumulation	:	N.A.
Fish toxicity	:	N.A.
Others	:	Do not dump this product into sewers, any ocean or water area in order to prevent marine animals and birds from ingesting.

13. DISPOSAL CONSIDERATION

Dump the waste in accordance to law, rules and regulations.



14. TRANSPORT INFORMATION

International guideline :
None.

Specific safety measures and conditions on transport :
Avoid wetting or rough handling so that the packaging will not be damaged. In case the bags are damaged and the pellets are scattered, pay attention so that no one will slip and fall. All of the materials that spilled shall be rapidly collected.

15. REGULATORY INFORMATION

Other regulatory information :
We are not able to check up the regulatory information in regard to the substances in your country or region. Therefore, we request this matter would be filled by your responsibility. Regulatory information with regard to this substance in your country or in your region should be examined by your own responsibility. Ensure this matter in compliance with federal requirements and ensure conformity to local regulations.
UL94(HB).

16. OTHER INFORMATION / REFERENCES

This information relates to this specific material. It may not be valid for this material, if used in combination with any other materials or in any process. It is user's responsibility to satisfy him-selves as to the suitability and completeness of this information for his own particular use. The information herein is given in good faith, but no warranty, express or implied, is made. Please consult us for further information. To the best of our knowledge, the information contained herein is accurate. However, we assume any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of user. All materials may present unknown hazards and should be used in caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist. This information contained in this data sheet represents the best information currently available to us. However, no warranty is made with respect to its completeness and we assume no liability resulting from its use. It is advised to make their own tests to determine the safety and suitability of each such product or combination for their own purposes.