



东莞市一佳电子通讯科技有限公司

Dongguan YiJia Electronics Communication Technology Co.,Ltd.

规格承认书

SPECIFICATION FOR APPROVAL

日期 2021/07/12
Date

编号 20071201
File No

版本 1.0
Revision

客 户 鲁邦通

CUSTOMER: _____

客户料号

CUSTOMER NO: _____

品 名 4G Antenna

PART NAME: _____

供方料号 YJQ01.039.001.101A

SUPPLIER NO: _____

送样日期Date:

送样数量Q “TY:

客户确认CUSTOMER APPROVED BY		
APPROVAL	CHIEF	SUPERVISOR

供方确认 SUPPLIER SIGNATURE		
APPROVAL	CHECK	DESIGN
 ChenGuoqiang	WenXue	ChenXingcheng

YJ-RD-F04-A

add: 东莞市长安镇沙头社区木鱼路59号元富工业区 Tel:0769-82586086 Fax:0769-82586086



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RoHS
Compatible

CUSTOMER
PART NO

REV.

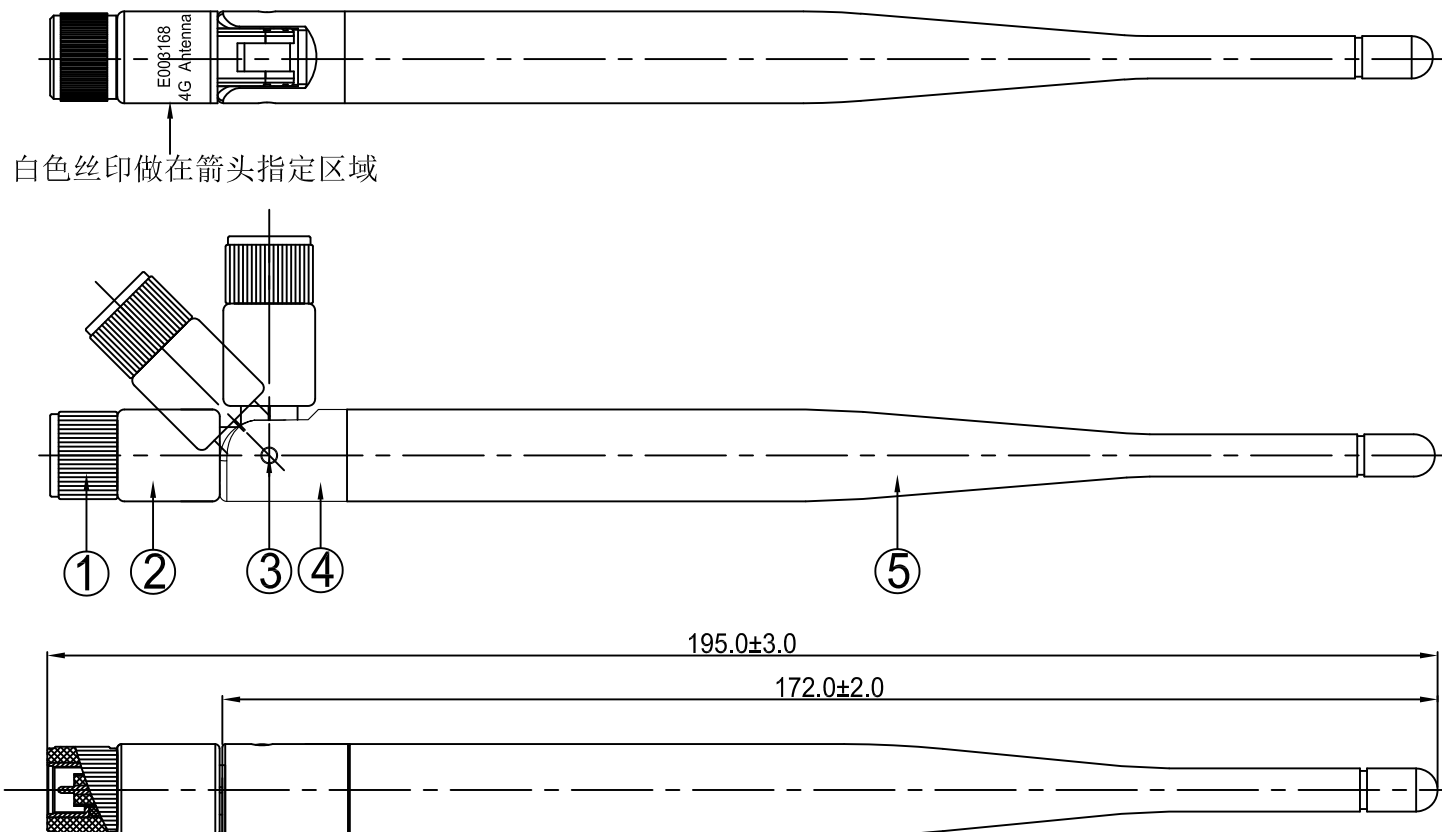


DESCRIPTION

首次发行

DATE

2021.07.12



5	Antenna Cap	TPEE ,Color:Black	1
4	Upper Base	PC, Color:Black	1
3	Rivet	POM, Color:Black	2
2	Bottom Base	PC, Color:Black	1
1	SMA Male	POM Black	1
NO	PART NAME	DESCRIPTION	Q.TY



东莞市一佳电子通讯科技有限公司

Dongguan Yijia Electronics Communication Technology Co.,Ltd. Tel :0769-85535057 Fax:0769-81664308

PART NAME: 4G Antenna

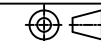
PART NO.: YJQ01.039.001.101A

DATE: 2021.07.12

APPROVED BY

CHECKED BY

DESIGNED BY



UNITS: mm

SCALE: 1/1

REVISION: A

Tolerance
X.X ±0.50
X.XX±0.15
X° ±3°

殷涛

覃健宇

陈兴易



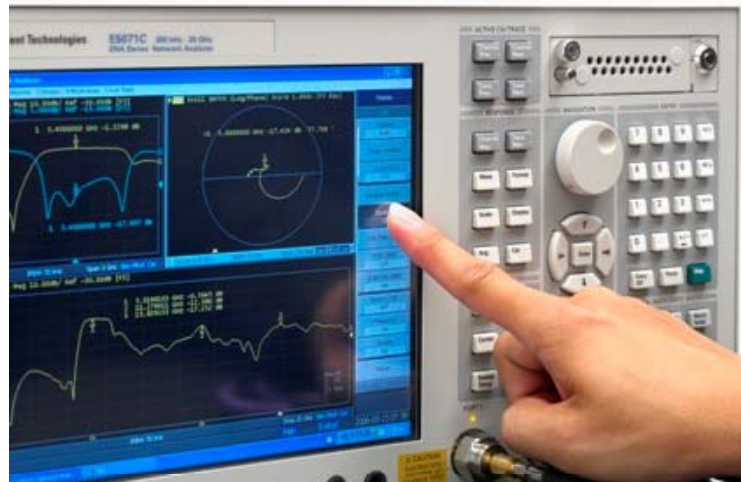
天线规格

Antenna Specification

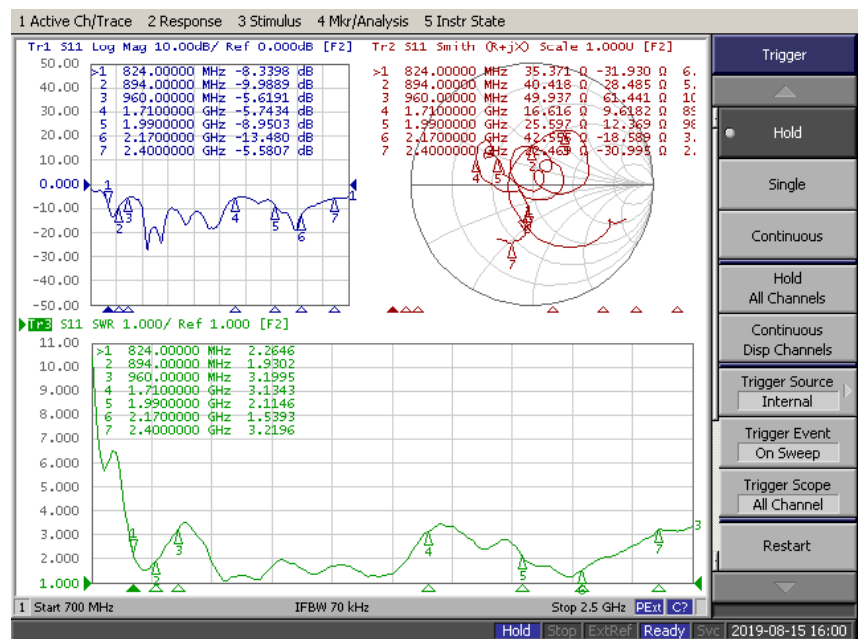
Electrical Properties	
Frequency	824-960MHz 1710-2400MHz
Impedance	50 Ohm Nominal
V.S.W.R	3.5 Max@824-960MHz 4.0 Max@1710-2400MHz
Gain	2.2dBi@824-960MHz 2.6dBi@1710-2400MHz
Radiation	Omni-directional
Polarization	Linear
Physical Properties	
Connector	SMA Male
Cable Type	None
Cable Length	None
Cable Color	None
Operating Temp.	-40 ~ +85 °C
Storage Temp / Humidity.	25±5°C / <70%



Agilent E5071B

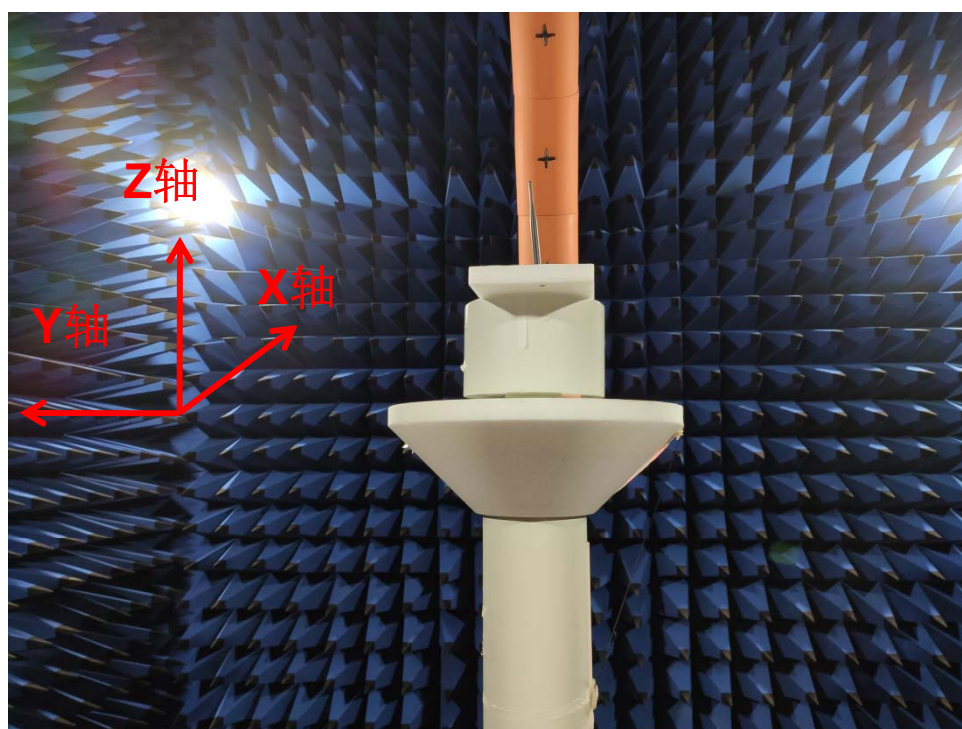
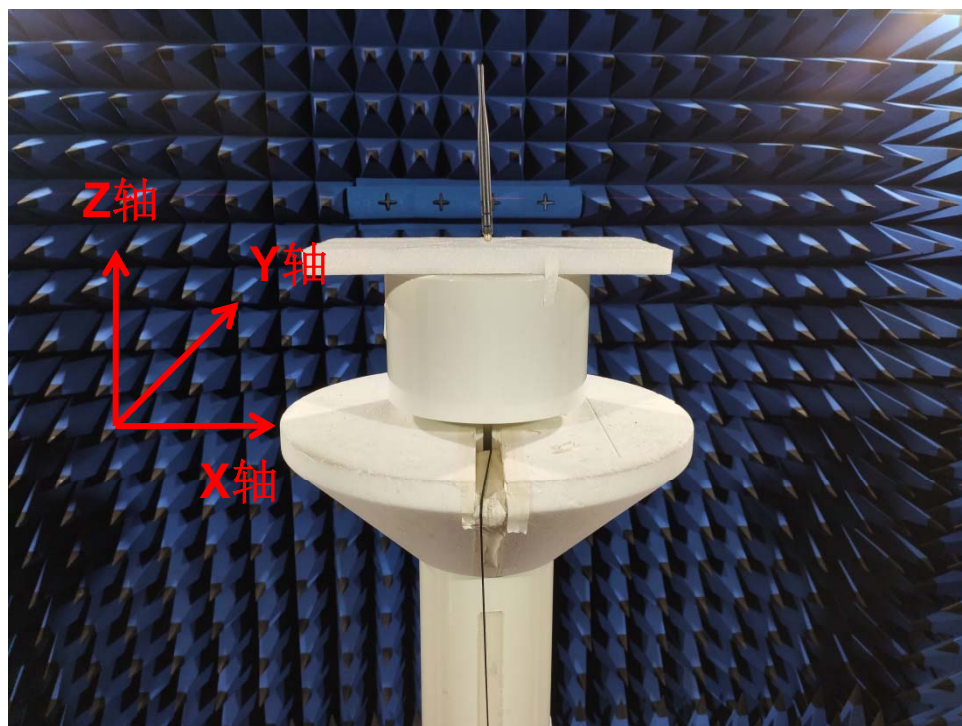


S Parameter Test // LTE





Antenna Passive Test





Passive Test For LTE			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
820	48.8	-3.1	-0.4
840	69.5	-1.6	1.2
860	76.9	-1.1	1.4
880	70.6	-1.5	1.6
900	65.0	-1.9	1.7
920	68.2	-1.7	1.6
940	62.2	-2.1	2.1
960	58.1	-2.4	2.2



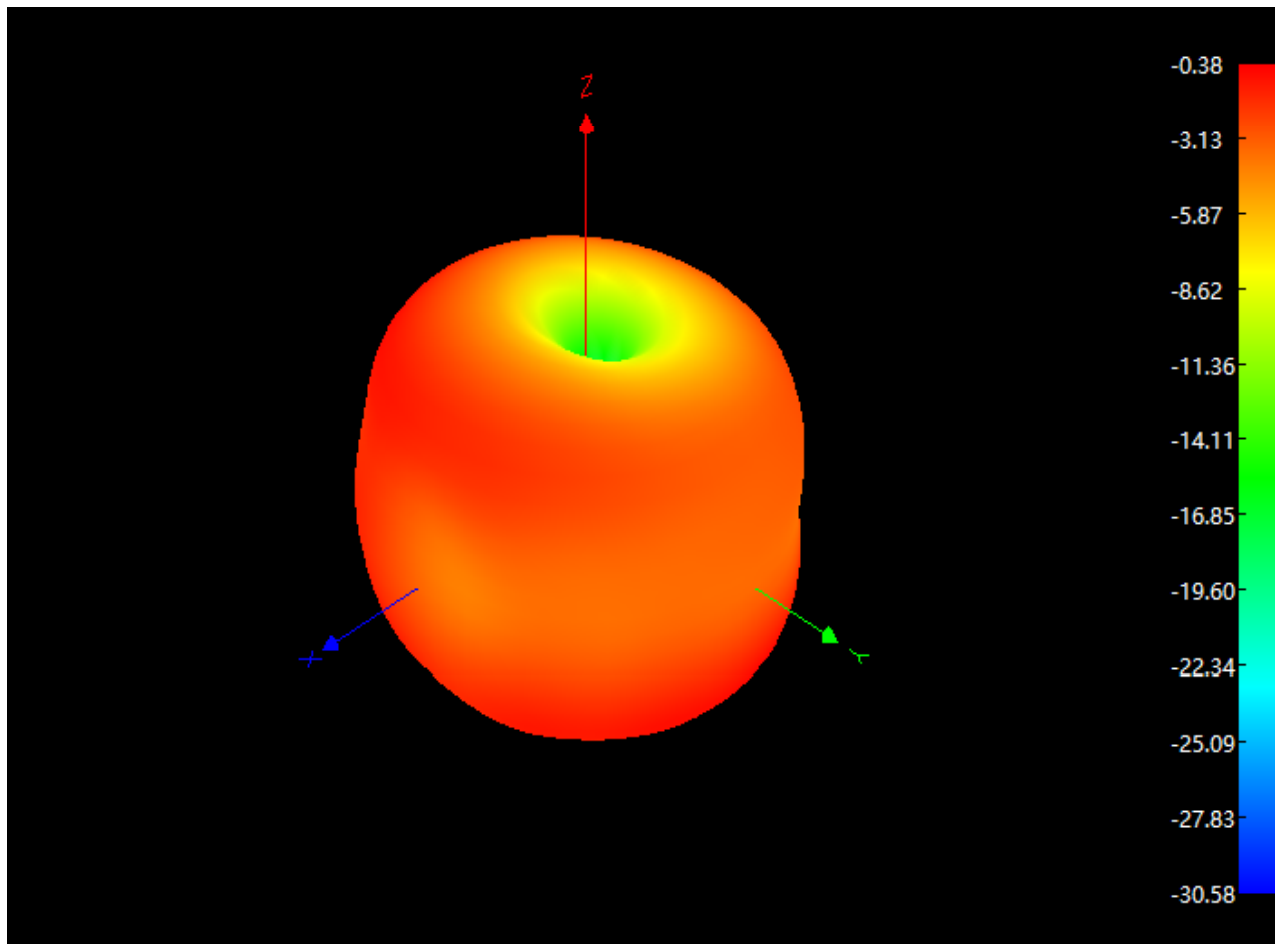
Passive Test For LTE			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
1700	56.5	-2.5	2.3
1720	55.0	-2.6	2.0
1740	55.2	-2.6	2.2
1760	56.8	-2.5	2.6
1780	52.6	-2.8	2.3
1800	47.5	-3.2	2.0
1820	43.8	-3.6	2.0
1840	40.0	-4.0	1.7
1860	40.6	-3.9	1.8
1880	38.6	-4.1	1.5
1900	41.7	-3.8	1.9
1920	41.5	-3.8	1.5
1940	46.8	-3.3	1.7
1960	44.8	-3.5	2.0
1980	48.9	-3.1	2.0



Passive Test For LTE			
Freq (MHz)	Effi (%)	Effi (dB)	Gain (dBi)
2000	46.5	-3.3	0.9
2020	50.7	-3.0	0.6
2040	58.2	-2.4	1.4
2060	61.9	-2.1	1.8
2080	65.8	-1.8	1.5
2100	69.0	-1.6	1.2
2120	74.1	-1.3	1.4
2140	74.8	-1.3	1.5
2160	77.8	-1.1	1.4
2180	73.5	-1.3	0.9
2300	55.1	-2.6	-0.5
2320	62.5	-2.0	0.2
2340	60.0	-2.2	-0.1
2360	61.1	-2.1	-0.2
2380	57.0	-2.4	-0.4
2400	53.6	-2.7	-0.6

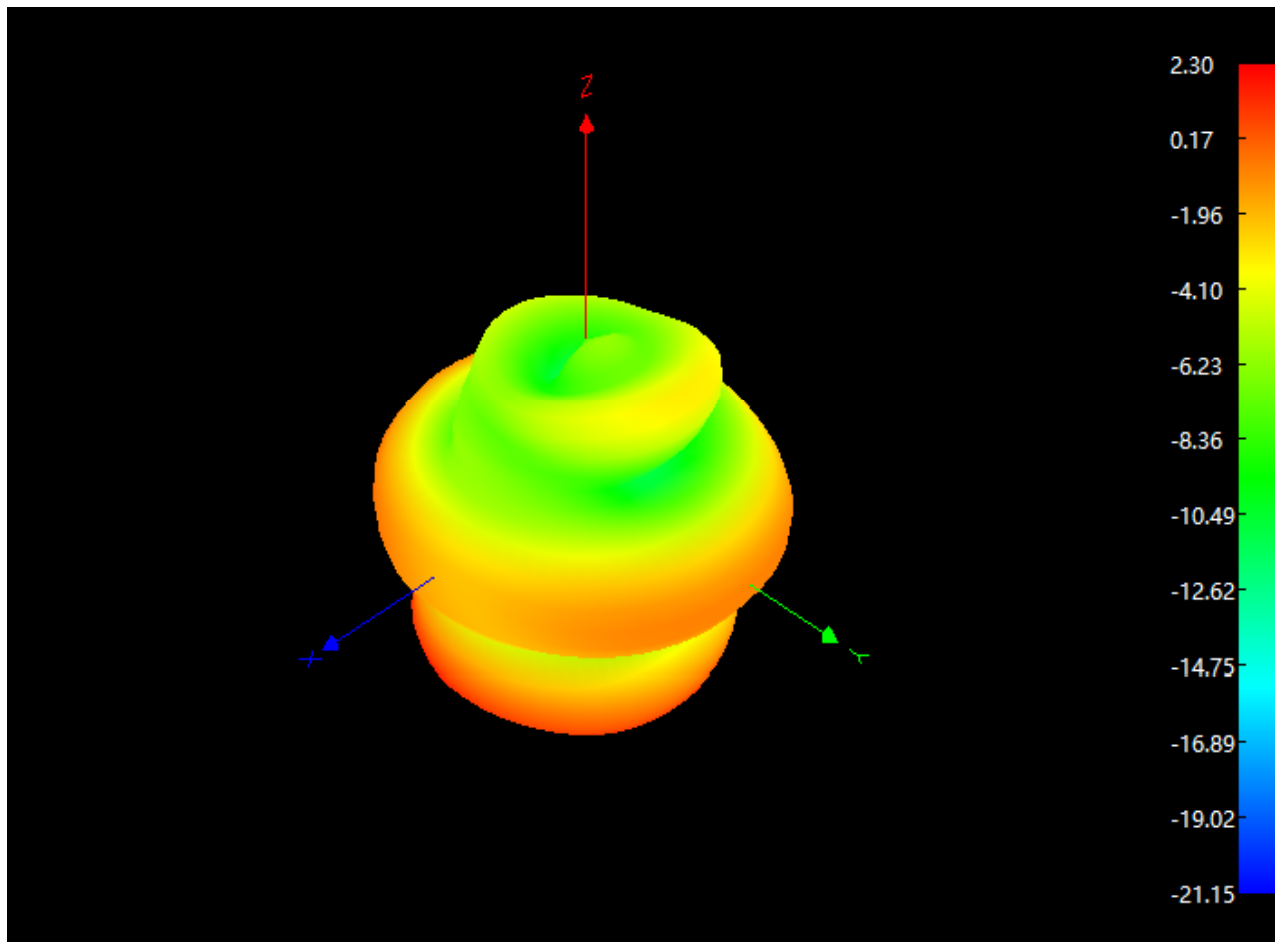


Radiation Pattern For LTE





Radiation Pattern For LTE





Antenna LTE





製品安全データシート

整理番号
作成・改訂日
製品の名称・製品コード

011101-2J
2002-4-19

® L-****

備考

*: 数字、#: 1 又は 2 文字の記号がつくものも含む

1. 製品及び会社情報

会社名	帝人化成株式会社
住所	〒100-0011 東京都千代田区内幸町1-2-2 日比谷
担当部門	環境・品質管理部
電話番号	03-3506-4717
FAX番号	03-3580-6680
緊急連絡先	帝人化成(株) 三原工場 品質保証課
緊急連絡先 TEL	0848-63-9966
緊急連絡先 FAX	0848-63-5634

2. 組成、成分情報

単一化学物質・混合物の区別	単一製品
化学物質名又は一般名	99wt%以上
別名・CAS No.	25971-63-5(主成分)
(単一化学物質の場合) 危険有害	該当しない
(混合物の場合) 化学特性	-
(混合物の場合) 危険有害成分	-
化学式又は構造式	(C16H14O3)n
官報公示整理番号	化審法;(7)-738 安衛法; 該当しない
化学物質管理促進法	該当しない

3. 危険有害性の要約

分類の名称	分類基準に該当しない。
最重要危険有害性	該当しない
特定の危険有害性	該当しない

4. 応急措置

吸入した場合	溶融物から発生するガスを吸い、気分が悪くなった場合は直ちに新鮮な空気のある場所に移し、回復を待つ。回復しないときは医師の手当を受ける。粉塵等を吸い込んだ場合は、良くうがいをし、新鮮な空気を吸う等の処置をする。
皮膚に付着した場合	溶融物の場合は、ただちに清浄な水で冷やす。皮膚上の固まった樹脂を無理に剥がさない。火傷があれば医師の手当を受ける。通常の場合は、水、石鹼を使用して付着した部分を良く洗い流しておく。
目に入った場合	溶融物の場合は、ただちに清浄な水で15分間以上冷やすと同時に洗浄し（コンタクトレンズをしていれば外し）、医師の手当を受ける。通常の固体の場合は、まず数分間多量の水で洗い流し（コンタクトレンズをしていれば外し）、不快感が残るようであれば医師の手当を受ける。
飲み込んだ場合	出来るだけ吐き出し、不快感が残るようであれば医師の手当を受け

5. 火災時の措置

消火剤 水、各種消火剤（粉末、泡）を使用することが出来るが、特に水の使用が冷却効果の観点から望ましい。

消火方法 一般の火災と同じ消火方法を用いることができる。燃焼時には炭酸ガスの他に一酸化炭素等の有害なガスが発生するため注意を要する

6. 漏出時の措置

人体に対する注意事項 道路や床にこぼした場合、転倒の恐れがあるので漏出物は全量回収する。^{1, 2)}

環境に対する注意事項 排水系に流出した場合は、海洋生物、鳥類が摂取することを防止するため全量回収する。

7. 取扱い及び保管上の注意

取扱い ペレット状の樹脂は、常温で引火の恐れはないが、作業では火気をみだりに使用しない。機械加工時に粉末が発生する場合は、粉塵爆発の可能性があるのでアースを設け静電気を除去する。加熱加工時は、溶融によって発生するガスを吸収しないように有効な局所排気装置等を設置する。熱分解を起こすので、長時間高温状態で滞留させない。火傷の恐れがあるので、溶融した高温の樹脂には触れないようにする。床上にこぼれたペレット等は、放置すると足下が滑って転倒を招く恐れがあるので、速やかに清掃して取り除く。

保管 直射日光に当たらない熱、発火源から離れた乾燥した場所に保管する。静電気災害を防止する対策をとる。

8. 暴露防止及び保護措置

設備対策 粉塵が発生する場合や高温加工時に有害なガスが発生する場合には、快適な作業環境を得るために有効な局所排気装置を設ける。

許容濃度 日本産業衛生学会、ACGIHともに設定されていない。しかし、ポリカーボネートの粉塵に対しては、次の値を採用するのが妥当と考える（参考値）。日本産業衛生学会勧告値（92年版）第3種粉塵 時間加重平均値 吸入性粉塵 2 mg/m^3 総粉塵 8 mg/m^3 ACGIH勧告値（92～93年版）総粉塵 10 mg/m^3 （データの御使用にあたっては、最新版をご確認ください）

9. 物理的および化学的性質

外観等 ペレット

P H 該当しない

物理的状態が変化する特定の温度 / 温度範囲 沸点： 該当しない 融点： はっきりとした融点を示さないが、 240°C 以上で流動する。

引火点 522°C 以上³⁾

発火点 550°C 以上³⁾

爆発特性 粉塵の爆発下限界濃度 25 g/m^3 ⁴⁾

蒸気圧 無視しうる。

蒸気密度	該当しない
密度	1.2
溶媒に対する溶解度	不溶/水
その他のデータ	知見無し

1 0 . 安定性及び反応性

可燃性	消防法上酸素指数 2 6 以上の難燃性を有するものにランクされている
発火性	無し
酸化性	無し
自己反応性	無し
粉じん爆発性	最小着火エネルギー 2 5 mJ (ミリジュール) ⁴⁾ 最大爆発圧力 6 . 7 kg/cm ² (0 . 6 MPa) (ゲージ圧力)
安定性・危険な反応性	常温・常圧で単独では安定で反応性はない。
危険有害な分解生成物	無し
UL性 (L-****Z)	無し

1 1 . 有害性情報

注釈	(記載グレードについてのデータではないが、主成分である一般的なポリカーボネートのデータを参考までに記載する。)
局所効果	皮膚腐食性: 知見無し 刺激性: 乾燥、溶融時に発生するガスは、眼、皮膚を刺激することがある。また、粉末が眼、皮膚を刺激することがある。
急性毒性	知見無し
亜急性毒性	3 0 ~ 4 0 匹の雄雌のラットに、微粉化したポリカーボネートを 6 % 含む粥状の飼料を自由に摂取させ、8 週間飼育した。体重の低下はなかった。血液像、X 線検査、病理解剖、臓器の組織検査の結果は正常であった。 ⁶⁾
慢性毒性・長期毒性	知見無し
発がん性	知見無し
変異原性	無し ⁷⁾
催奇形性	知見無し
生殖毒性	3 0 ~ 4 0 匹の雄雌のラットに、微粉化したポリカーボネートを 6 % 含む粥状の飼料を自由に摂取させ、8 週間飼育した。生殖機能は正常であった。 ⁶⁾

1 2 . 環境影響情報

環境中での製品の予測される挙動 / 起こり得る環境影響 / 生態毒性	海洋生物、鳥類が摂取することを防止するため、いかなる海洋や水域でも投棄、放出してはならない。
------------------------------------	--

1 3 . 廃棄上の注意

廃棄上の注意	「廃棄物の処理及び清掃に関する法律」に従い、公認の産業廃棄物処理業者、もしくは地方自治体が処理を行っている場合には、その自治体に委託して処理する。 ²⁾ 焼却する場合は、管理された焼却設備を用いて、廃掃法、大気汚染防止法、水質汚濁防止法等の諸法令に適合した処理を施して処理する。 ²⁾
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1 4 . 輸送上の注意

国連分類・国連番号

該当しない

特定の安全対策・条件

空気輸送を行う場合は、静電気災害防止対策をとる。梱包袋が破れないように、水濡れや乱暴な取扱いを避ける。もし、破袋してペレットが飛散した場合は、滑って転倒しないように注意する。

1 5 . 適用法令

法規制

労働安全衛生法： 該当しない。

消防法： 該当しない。

毒物及び劇物取締法： 該当しない。

船舶安全法・航空法： 該当しない。

廃掃法： 産業廃棄物、廃プラスチック類に該当する。

1 6 . その他の情報

引用文献

¹⁾ 樹脂ペレット流出防止マニュアル，日本プラスチック工業連盟，平成5年2月 ²⁾ 廃プラ Q & A，工業用熱可塑性樹脂技術連絡会 (1992) ³⁾ R.M.Asseva and G.E.Zaikov: "Combustion of Polymer Materials" Hanser Publishes, p46 (1986) ⁴⁾ 粉体と工業 1984年5月号 66ページ ⁵⁾ 消防予第184号、消防庁予防救急課長通知，昭和54年10月2日 ⁶⁾ G. Bormann et al., Arzneimittel – Forsch. 9, 9 (1959) ⁷⁾ ポリカーボネート樹脂技術研究会資料

注

記載の情報は現時点で入手できる資料、情報、データに基づいて作成しておりますが、新しい知見により改訂される場合があります。注意事項は、通常の実施を前提としたものであるため、特殊な取扱いの場合には、用途、用法に適した安全対策を実施の上、ご利用下さい。本資料に記載の内容は、情報提供であって保証するものではありません。

MSDS Material Safety Data Sheet

一. Info of products and suppliers:

产品名称: 镍加剂
English Name of the product: NICKEL ADDITION AGENT
产品编号: MEC-918 MEC-928
Product No.: MEC-918 MEC-928
制造商或供应商名称: 深圳多鑫实业有限公司
Manufacturer or supplier name: Shenzhen Xin Industry Co., Ltd.
制造商或供应商地址: 深圳市松岗镇江边第三工业区创业五路
Manufacturer or supplier address: Songgang Zhenjiang Shenzhen third industrial zone five road
制造商或供应商电话: 0755-27144330 传真: 0755-27130680

二. Ingredients' identical data:

Chinese (English) name:	Chemical formula	Content	Register No. of Chemical Abstracts Service (CAS)
Brightener of Nickel Agent	...	100%	2917-28-X
Throwing Agent	...	100%	2917-28-Y
Synonym name: ...			

三. Hazards identification data:

Most serious hazards	No assessment data for reference. The hazard of the material can be classified according to the management standard of 67/548/EEC. However, the standard has been canceled by German government, so we made a note here. Yet under such a circumstance it does not mean we will not consider the hazard of the material.		
	Health damage: serious erosion		
	Environment pollution: dangerous pollutants to water		
	Physical and chemical hazard: Serious erosion		
	Special hazard: None		
Major symptom: it will cause dizziness, heat and swirling when entering body inside			
Hazardous materials:100%		Figure: fluid	

四. First-aid guidance:

Different ways of first aids for different exposures:	
Inhalation: Move the victim to the place with fresh air	
Skin contact: 1: Wash with plenty of water	
2: Take off the contaminated clothes	
Eye contact: 1: Make the eye open wide and wash it with plenty of water	
Ingestion: Drink a lot of water and force the victim to vomit. Send to hospital immediately if the victim is unconscious.	
Most important symptoms and hazardous effect:	
Protection to the medical staff: 1. No staff should enter the disaster area to move out the victims without	
2. wearing the full-body chemical protective suit and air respirator.	
Tips to doctors: Force the victims to vomit	

五.Fire control guidance:

Applicable fire extinguishers: dry chemical powder, alcohol bubble, water spray and carbon dioxide extinguishers.

Possible hazards during fire extinguishing:

The burned materials could generate hazardous flammable air or vapor

special fire extinguishing procedure

The special protective equipment of firemen: Firemen must wear full-body chemical protective suit and portable air respirator (wear anti-sparkling fire aluminum covering coat)

Other info: Avoid the fire-fighting water flowing down to the surface or inside of the earth in case of second contamination

六.Leaking disposition guidance:

Tips for individuals:

1. Restrict the entrance of the contaminated area before it has been cleaned up.
2. Make sure the cleaning job is taken by trained staff
3. The cleaning staff should wear proper personal protective tools and suits in the contaminated area
4. Ask suppliers for the proper absorbent or cleansers for the leaking contamination source
5. Never inhale the material.
6. Make sure the sealed area has enough clean air to supply.

Environment protection guidance:

1. Keep good ventilation to the area
2. Put out or remove all the ignitable source
3. If the material are released to the surroundings, local environmental protection units and labor inspection units should be informed
4. Avoid direct discharging the material into drainage system

Clean guidance:

1. Don't touch the leaking material
2. Avoid the material going into drainage, sewage or sealed area.
3. If safety is guaranteed, move the containers which are easy to leak to the outdoors or isolated ventilated place. Move the material inside to other proper containers and put tags on them.
4. Use vapor inhibiting bubble bath to reduce vapor
5. Clean the castoff

七.Safety disposition and storage guidance:

Disposition: No special requirement

Storage:

1. Store in sealed containers and save in cool and dry place. Keep them away from working places and other incompatible stuffs.
2. The storing area should be equipped with independent ventilation system and should not have any heat source, fire and sparkle.
3. The best way is to store them in the qualified and safe containers.
4. Seal the container with cover after using it
5. Save them in cool, dry and ventilating place where no sunshine can be reached directly.
6. The empty container may still contain the leftover of the hazardous material
7. There must be usable fire extinguisher in the storing area and the place nearby
8. Store temperature: the material should be stored between 15 °C -25 °C . The temperature should not be higher than 40 °C

八.Exposure prevention guidance:

Engineering control: Ventilation equipment

Control parameters:

Acceptable concentration:			Biologic indicator	
Time average acceptable concentration	Short time average acceptable concentration	Max. acceptable concentration	LD ₅₀ (Test the absorbing way of animals)	LC ₅₀ (Test the absorbing way of animals)
Personal protective equipments: Breathing protection: put on when vapor/.aerosol is generated Eye protection: safety goggle Skin and body protection: 1. Choose proper protective suit according to the concentration and quantity of the hazardous material 2. Wear the suit which is confirmed with suppliers that the suit can keep the very material away Other protective tips: Hygiene guidance: 1. Get rid of the contaminated suit immediately after work. The suits must be cleaned before being put on again or being discarded. It is necessary to inform the suit washing staff the hazards. 2. Use skin protective cream according to suggestion 3. After dealing with the materials, we must wash our hands thoroughly.				

九. Physical and chemical data:

Physical state: fluid, fluidized air, pressed air	Color: Brown
Form: sticky	Water solubility: Completely soluble

十. Safety and reaction

Safety	Safe	√	Possible hazardous reaction in special circumstances	---
	Not safe			
Hazardous cleavage products: ---				
Situation to be avoided: let the material enter human body				
Materials to be avoided: ---				

十一. Poison info:

Acute toxicity
Local effect:
Sensitive:
Chronic:
Special effect: In the consideration of structure-effect, this is not included. Possible symptoms: Headache, dizziness, cramp, vomit and cyanotic diseases

十二. Ecological info:

Ecological toxicity: Most ecological influence data of the material are not available
Biodegradability:

Possible effect on environment:

Other ecological data: Don't let it get in to water sources, sewage or soil

十三.Castoff disposition guidance:

Castoff disposition guidance:

Products:

1. The laws and regulations of EC on the material and its leftover vary from each other.
2. The chemical leftover usually can be treated as special castoff
3. The disposition of the leftover of the related products are implemented according to the laws and regulations of the member countries of EC
4. It is suggested to contact the environment unit of the government or let professional disposition companies to do it for you

Package

1. The discarding and disposition should be done according to laws and regulations
2. The packaging of the contaminated material must be the same as the original products
3. If there is no specific requirement on the laws, the package can be done like the castoffs for the daily castoff or can be recycled like them.

十四.Delivery info:

International delivery policies:

Delivery on land:

Delivery on sea:

Delivery by air:

1. ICAO>IATA classify them as the other hazardous stuff in Type No. 9.

United Nations (UN) No.:

Domestic delivery regulation:

1. No. 84 of the road traffic safety regulation
2. Hazardous stuff loading regulation on vessels
3. Loading, unloading and the delivery of hazardous stuffs by train regulation

十五.Applicable laws and regulations

1. Labor safety and hygiene facilities regulation
2. Road traffic safety regulation

十六.Other data:

Hazard level	NFPA	HMIS	Level: 0: min. 1. a little 2: medium 3: high 4: serious NFPA: Hazard levels of National Fire Prevention Association HMIS: Hazard levels of Hazardous Material Identification System
Health	4	4	
Ignitability	1	1	
reaction	3	3	

All the info above should be filled by MSDS of the original FLY CHEMICALS CO. LTD. We try to make every item correct but somehow mistakes are not avoidable. All the data are just for your reference. User should judge the applicability by themselves according to their own need. The Company will not be held liable for any law liability.

MATERIAL SAFETY DATA SHEET (MSDS)

Issued: Feb 22, 2002

Revised: Aug 11, 2004

File No. 1001

1. CHEMICAL PRODUCT & COMPANY IDENTIFICATION

CHEMICAL PRODUCT NAME : DURACON M90-00
NAME OF COMPANY : Polyplastics Co.,Ltd.
SECTION IN CHARGE : Quality Assurance Dept.
ADDRESS : 2-18-1 Konan, Minato-ku, Tokyo,108-8280 Japan
TELEPHONE NUMBER : 03-6711-8605
FACSIMILE NUMBER : 03-6711-8606

2. COMPOSITION/INFORMATION ON INGREDIENTS

SUBSTANCE/PREPARATION : Substance
COMMON CHEMICAL NAME : Polyoxymethylene
SYNONYMS : Polyacetal(POM)
INGREDIENTS AND COMPOSITION : POM $\geq 98\%$, Stabilizers etc. $\leq 2\%$
CHEMICAL FORMULA : $\left[\text{CH}_2 - \text{O} \right]_n / \left[\text{CH}_2\text{CH}_2\text{O} \right]_n$
SERIAL No IN OFFICIAL GAZETTE : 7-129 (base resin)
(Law Concerning Examination and Regulation of Manufacture, etc., of Chemical Substances)
CAS No : 24969-26-4 (base resin)
INGREDIENTS CONTRIBUTING TO THE HAZARD : Formaldehyde

3. HAZARDS IDENTIFICATION

MOST IMPORTANT HAZARDS : Incomplete combustion leads to generation of toxic gases such as carbon monoxide, in addition to carbonic acid gas and water.
Decomposition of polymer also leads to generation of formaldehyde.
HUMAN HEALTH EFFECTS : Not applicable
ENVIRONMENTAL EFFECTS : Not applicable
PHYSICAL AND CHEMICAL HAZARDS : It is inflammable substance and combustible if an igniting source is existent. Neither dangerous reaction, fire nor explosion can be caused under normal conditions.
THE CLASSIFICATION : Not applicable

4. FIRST-AID MEASURES

INGESTION : Help to vomit as much as possible. If sick feeling continues, ask a physician for advice.
INHALATION : When a gas generated from the molten polymer has been inhaled, remove fresh air without delay and wait until the victim is recovered. If sick feeling continues, ask a physician for advice.

SKIN CONTACT	: Cool the contacted skin with clean water without delay, if a contact with the polymer in a molten form. Do not force to remove the solid resin on the skin. If any burns are observed on the skin, ask a physician for advice.
EYE CONTACT	: Cool and rinse the eye with clean water for at least 15 minutes when the eyes had contact with molten polymer. In case of wearing contact lenses, remove the lenses as soon as possible, and ask a physician for advice. When the eye had contact with the polymer in an ordinary solid form, rinse the eye with clean water without delay. If the discomfort persists, ask a physician for advice.

5. FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA	: Water, foam fire-extinguishing agent, powder fire-extinguishing agent, and carbon dioxide gas.
SPECIFIC METHODS	: Extinguish the fire with water. A method of extinguishing an ordinary fire may be applied. Do not apply water directly to processing machines.
SPECIFIC HAZARDS	: Incomplete combustion leads to generation of toxic gases such as carbon monoxide or formaldehyde, in addition to carbonic acid gas and water.
SPECIAL EQUIPMENT FOR THE PROTECTION OF FIREFIGHTERS	: In case the fire gained force, use a gas mask or other protective equipment.

6. ACCIDENTAL LEAKAGE MEASURES

PERSONAL PRECAUTIONS	: When pellets were spilled on the road or floor, wipe them off with a broom or cleaner not to cause slipping.
ENVIRONMENTAL PRECAUTION	: Handle the spillage in accordance with provisions given in the "Resin pellet spillage preventive manual", in order to prevent intakes by marine animals and birds.

7. HANDLING AND STORAGE

HANDLING	: Polyacetal resin in a pellet form will neither ignite nor explode at room temperatures, but it falls under the inflammables designated by the Fire Service Law. Keep it away from the igniting sources, as it quickly gains force once it is ignited.
HANDLING 2	: Polyacetal resin in a powdered form is likely to cause dust explosion and is therefore designated in the Guideline for Hazard of Dust Explosion in U.S. Bureau of Mines. Effective earthing means or use of inert gas like N ₂ are required for dust handling equipment to eliminate static electricity.
HANDLING 3	: Polyacetal pellets spilled on the floor are likely to cause slipping. Remove such spillage at any times.
HANDLING 4	: For molding work, effective means for local exhaust are required to discharge gases generated by melt processing.
HANDLING 5	: Avoid inhaling of gases generated in moulding work. Do not directly touch resin of high temperature.
HANDLING 6	: Avoid retaining hot resin in the processing machines for many hours.
HANDLING 7	: Avoid mixed extrusion with strong acid, oxidizing agents and PVC.
STORAGE	: Keep the substance away from any fire or heat sources for the sake of safe storage.
STORAGE 2	: This polymer is a synthetic resin designated as an inflammable substance by the Fire Service Law and should be handled in accordance with municipal rules and regulations (concerning fire-fighting equipment, indoor storage, for instance).

RECOMMENDED : No information.
PACKAGING
MATERIALS

8. EXPOSURE CONTROL / PERSONAL PROTECTION

CONTROL : None at present
CONCENTRATION

PERMISSIBLE : OSHA PEL/1985
CONCENTRATION Max. permissible concentration of inactive powder 15mg/m³
- ditto - (Aspiration) 5mg/m³
ACGIH TLV/1992 1993
Exposure limit of the powder TWA 10 mg/m³
(Reference) Human exposure to formaldehyde
- Ministry of Health & Welfare/2002
Guideline value 0.08 ppm
OSHA Parameter/1992
TWA 0.75 ppm
STEL 2 ppm
ACGIH TLV/1992 1993
TWA 0.3 ppm

ENGINEERING : When handling dust: Use totally enclosed containers resisting dust
MEASURE explosion.
When heat melted in molding: Effective local ventilation must be provided.

PERSONAL :
PROTECTIVE
EQUIPMENT

RESPIRATORY : Wear a dust-proof mask.
PROTECTION

EYE PROTECTION : Wear protective glasses or goggles.

HAND PROTECTION : Wear heat-resisting gloves against burns, when handling molten polymer.

SKIN & BODY : Wear long sleeve clothes against burns, when handling molten polymer.
PROTECTION

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE etc. : Pellet

BOILING POINT : Not applicable

VAPOUR : Not applicable
PRESSURE

VOLATILITY : Not applicable

SUBLIMATION : None

MELTING POINT : 165°C

DENSITY : 1.41

SOLUBILITY : Insoluble in water

FLASH POINT : 320°C or higher

IGNITION POINT : 400°C or higher

EXPLOSION : Not applicable
PROPERTY

INFLAMMABILITY : Inflammable(Designated as inflammable resin by the Fire Service Law)

REACTIVITY WITH : None
WATER

OXIDIZABILITY	: None
SELF-REACTIVITY	: None
DUST	: Upper explosion limit : Not applicable.
EXPLOSIVENESS	: Lower explosion limit : 35g/m ³

10. STABILITY AND REACTIVITY

STABILITY AND REACTIVITY	: Stable for normal storage or handling.
CONDITIONS TO AVOID	: Avoid contacts with strong acid, oxidizing agent or PVC under hot melt conditions.
HAZARDOUS DECOMPOSITION PRODUCTS	: Formaldehyde will be generated when heated (for drying or melting) or burnt.

11. TOXICOLOGICAL INFORMATION

SKIN CORROSIVE PROPERTIES	: No finding.
SENSITIZING & IRRITANT EFFECTS	: Gas generated in drying or melting is irritating eyes and skins.
ACUTE TOXICITY (INCLUDING LD50)	: No finding.
SUBACUTE TOXICITY	: No finding.
CHRONIC TOXICITY	: No finding.
CARCINOGENICITY	: No finding.
MUTAGENICITY (Microorganisms, chromosomal aberration)	: No finding.
REPRODUCTIVE TOXICITY	: No finding.
TERATOGENICITY	: No finding.
OTHERS (Including generation of hazardous gases by reaction with water, for example)	: No finding in this report means that there will be no hazard in general, but no proving data available at the time of reporting.
OTHER CAUTIONS	: With regard to dust, the maximum permissible concentration and limits are fixed by OSHA and ACGIH.
OTHER CAUTIONS 2	: Formaldehyde will be generated when heated (for drying or melting) or burnt.
OTHER CAUTIONS 3	: Carcinogenicity class of formaldehyde, which may be generated if overheated. IARC (International Agency for Research on Cancer): Group 1

12. ECOLOGICAL INFORMATION

BIODEGRADABILITY	: No finding.
BIOACCUMULATION	: No finding.
FISH TOXICITY	: No finding.

13. DISPOSAL CONSIDERATION

WASTE FROM RESIDUES	: This is designated as waste plastics among industrial wastes by the Wastes Disposal Law. Disposal waste Duracon through licensed wastes handlers or local autonomous bodies if they are handling wastes disposal.
WASTE FROM RESIDUES 2	: When disposed by incineration, use the well controlled incinerators in accordance with the Wastes Disposal Law, Air Pollution Control Law and Water Pollution Prevention Law.

14. TRANSPORT CONSIDERATION

UN CLASSIFICATION NUMBER	: Not applicable
OTHER CAUTIONS	: Handle with care so as not to give damages to containers or not to be subjected to wetting.
OTHER CAUTIONS 2	: Secure the containers firmly so as not to cause collapsing.

15. REGULATORY INFORMATION

FIRE SERVICE LAW	: Inflammable synthetic resin Designated quantity: More than 20m ³ for the foamed product. More than 3,000 kg for other types.
WASTE DISPOSAL LAW	: Waste plastics among industrial wastes.
OTHERS	: Formaldehyde is designated as Class 3 substance by the Industrial Safety and Health Law (Regulations concerning hazards caused by specific chemicals) and designated as deleterious substance by the Poisons and Deleterious Substance Control Law. Recommended usage, criteria, and limit values are provided by Japan Industrial Safety and Health Society, OSHA and ACGIH.

16. OTHER INFORMATION

HANDLING OF THE DETAILS GIVEN ABOVE	: This MSDS is the English version translated from the Japanese MSDS which is prepared for domestic use. Details given above are based on references, information and data available at this moment, but no warranty can be made on exactness of these details. They are also prepared on the assumption that the product will be handled in a normal way. For special handling, adequate safety and environmental measures should be taken in respect to its applications. Our products are not specifically intended for implants for medical and dental applications, and therefore they are not recommended for such applications. "No finding" in this report means that there will be no hazard in general, but no proving data is available at the time of reporting.
WHERE TO CALL FOR FURTHER INFORMATION	: Polyplastics Co., Ltd. Quality Assurance Dept. Tel. No 03-6711-8605

MATERIAL SAFETY DATA SHEET

1、Product and Company Identification

Product name : TPEE RESIN(Thermoplastic Polyester Elastomer)
Synonyms : TPEE CHANG CHUN 1163
Chemical Formula : $(C_{10}H_{10}O_4C_4H_{10}O_2(C_4H_8O)_nH_2O)_x$
Product Codes : 11series,12series, that include 1140H,1155L,1255L, etc.
Supplier Information : Chang Chun Plastics Co.,Ltd 301 Songkiang Road, 7th FL., Taipei, Taiwan, 10477
Emergency phone numbers : Tel 886-2-25038131, 886-2-25001800

2、Composition / Information on Ingredients

Ingredient	CAS Number	Percent (by weight)
Thermoplastic Polyester Elastomer	9078-71-1	>99%

3、Hazards Identification

Emergency Overview : Hazard warning not required
Adverse Human Health Effects : Vapour and fumes released at elevated temperature may be irritant for the eyes,the nose,the throat and respiratory tract and in case of overexposure may cause nausea and headache.
Environmental Effects : No Information available
Physical and Chemical Hazards : No Information available
Specific Hazards : No Information available

4、First-Aid Measures

Inhalation : When fumes of molten material have been inhaled: <ul style="list-style-type: none">- Move person to fresh air as quickly as possible- Rest in half upright position- Loosen clothing- Keep warm
Ingestion : No danger of toxicity,this material is biologically inactive
Skin Contact : If molted material contacts skin , cool rapidly with cool water,and seek medical attention. Attention : never pull off the molten material from the wound.
Eye Contact : Flush with water, and seek medical attention if it is necessary.

Protection of First-aiders : No Information available

Notes to Physician : If melted material contacts, cool rapidly with cool water, and seek medical attention.

5、 Fire-Fighting Measures

Extinguishing Media : Water, foam, carbon dioxide, dry chemical

Fire and Explosion Hazards : NA

Special Firefighting Procedures : Treat as a "class A" fire and avoid to breathe dust.
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Special Equipment for the Protection of Firefighters : Wear personal protective equipment

6、 Accidental Release Measures

Personal Precautions : Wear personal protective equipment

Environmental Precautions : This material presents no danger regarding toxicological and ecological consideration.
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Methods for Cleaning Up : Sweep up and place in disposal container and it could be recycled used.

7、 Handling and Storage

Handling : Make provisions for sufficient ventilation and local exhaust at vent, nozzle . Dust and processing fumes must be removed by effective exhaust ventilation.
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Storage : Store in a cool and dry place

8、 Exposure Controls / Personal Protection

Engineering Measure : NA

Control parameters : OSHA PEL(nuisance/inhale dust):15mg/M3(total),5mg/M3(respirable) ACGIH TLV(nuisance/inhale dust):10mg/M3(total),5mg/M3(respirable) · Limit values : NA · Biological Standards : NA
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Personal Protective Equipment : helmet, mask, safety shower, eye wash fountain · Respiratory Protection : dust mask · Hand Protection : plastic or rubber gloves · Eye Protection : wear safety goggles · Skin and Body Protection : wear protective gloves and clean body-covering clothing.

Specific Hygiene Measures : Adequate washing facilities with supplies of mild soap and hand cleaner should be available at all working locations. Solvents should never be used as hand cleaners. Smoking, eating and drinking in working and storage area should be prohibited.
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9、Physical and Chemical Properties

Physical State : Solid	Form : Pellet
Color : White	Odor : odorless
pH : ND	Boiling Point/Boiling Range : ND
Decomposition Temperature : >300	Flash Point & Method Used : >355
Auto Ignition Temperature : >420	Explosion Properties : ND
Vapor pressure : ND	Vapor density : ND
Density : 1.05-1.25	Solubility : ND

10、Stability and Reactivity

Stability : Stable under ordinary conditions of use and storage
Possible Hazardous Reactions Occurring under Specific Conditions : NA
Conditions to Avoid : Don't heat to >300 for long residence time to avoid thermal degradation.
Materials to Avoid : strong bases , strong oxidising agents
Hazardous Decomposition Products : CO

11、Toxicological Information

Acute toxicity : None
Local effects : The material appears to be a non-toxic substance in standard toxicological and ecotoxicological tests and is regarded as biologically inactive.
Sensitization : None
Chronic Toxicity or Long Term Toxicity : None
Specific effects : None

12、Ecological Information

Possible Environmental Effects, Behavior and Fate : Not hazardous in contact with water

13、Disposal Considerations

Recommended Methods for Safe and Environmentally Preferred Disposal : It can be burnt in a controlled way or be disposed of via landfill, or it can be recycle used

14、Transport Information

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International regulations : None
UN classification number : N.A.
Specific Precautionary Transport Measures and Conditions : No hazardous transportation product. Keep away from moisture.

15、Regulatory Information

Applicable Regulations : None

16、Other Information

NFPA Ratings : ---
Label Hazard Warning : The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied , with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purpose. In no way shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, however arising, even if the company has been advised of the possibility of such damages
Literature References : ---

原始作者 : 祝瀚揚