



# UNIVERSAL CHEMTECH

Production and supply of eco-friendly flame-retardants  
& Tailor-made flame retardants

## 회사 소개 WHO IS UNIVERSAL CHEMTECH

2002년 창사 이래로 오로지 비할로겐계 친환경 난연제 개발에 몸담아 온 (주)유니버설캠텍은 인계 및 질소계 난연제를 제조하고 있으며, 각종 수지별 맞춤형 난연제도 제공하고 있습니다. 또한 해외의 우수한 난연제 소싱을 통하여 고객의 품질향상과 원가절감에 기여하고 있습니다.

축적된 경험과 기술을 바탕으로 전기,전자, 자동차, 조선, 섬유 및 건축 등 다양한 고객의 생산환경에 맞춰 최적의 난연제를 제공할 수 있도록 노력하겠습니다.

Founded in 2002, Universal Chemtech Co., Ltd. has developed and manufactured the first halogen-free Melamine Cyanurate and phosphorous group flame retardants which have low smoke toxicity in Korea. Besides, we have supplied tailored flame retardants by customer's different industry like electricity, electronics, automobile, shipbuilding, textile and construction.

## 특허 PATENT



- Date of Reg. : Oct. 16 2014
- Hypophosphorous type flame retardant



- Date of Reg. : Aug. 22 2014
- Manufacturing method of rigid PU form complex heat insulator



- Date of Reg. : Aug. 24 2012
- Expandable fire resisting material



- Date of Reg. : Oct. 16 2007
- Fatty acid containing MC flame retardant



- Date of Reg. : Jun 10 2007
- MC Slurry for flame retardant



- Date of Reg. : Jan. 7 2006
- MPP of improved water stability





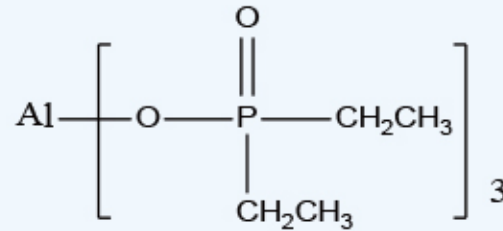
## OMP- 800

### 제품개요 PRODUCT OVERVIEW

OMP-800은 비할로겐계 친환경 인계 난연제의 한 종류인 Aluminum diethylphosphinate 화합물로서 내수성이 뛰어나고 분해 온도가 높아 PBT(Polybutylene terephthalate), PA(Polyamide) 등 고온가공을 요하는 각종 수지의 난연화에 매우 적합한 난연제입니다. 또한, 친환경 난연제이면서도 기존의 할로겐 난연제와 동일한 방식인 기상(Gas Phase) 난연 Mechanism을 가지고 있어 거의 모든 수지에서 뛰어난 난연효과를 나타내는 특징이 있습니다.

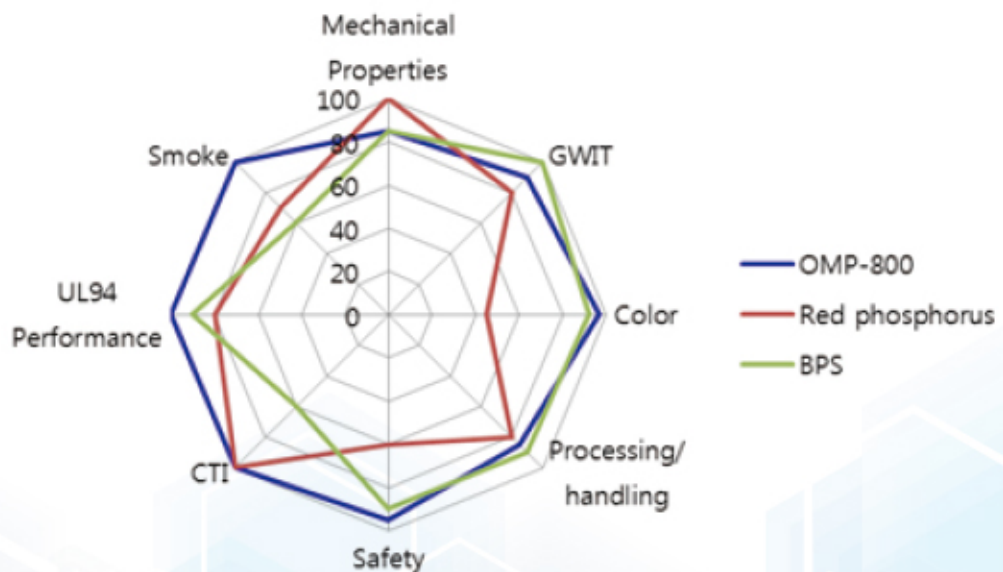
OMP-800 is formed from aluminum diethyl phosphinate, a compound that belongs to the family of eco-friendly phosphorus-based flame retardants, that displays excellent water resistance and high decomposition temperature, whose properties are suitable to make flame-resistant such resins as PBT (Polybutylene terephthalate) and PAs (Polyamides) which require high temperatures in their processing.

Furthermore, this product is halogen-free flame retardant; yet, it has the same gas-phase flame retardation mechanism as most other halogen type flame retardants so that it exhibits excellent flame-retardant effects in almost all resins.

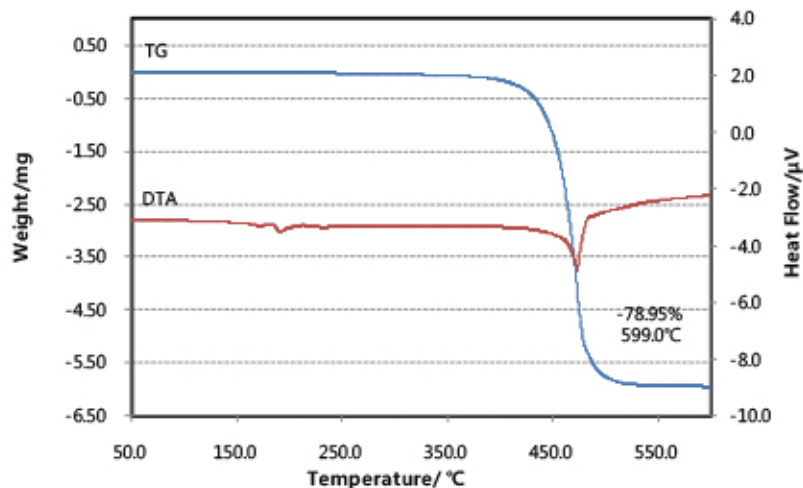


Structural formula of OMP-800

### 장점 ADVANTAGE



## • Thermogravimetric Analysis of OMP-series



## • APPLICATION

### 폴리아마이드 수지 (Polyamide resin)

Polymer : PA-6, PA-66, PA-12 등

주요 용도 : 전기전자재료, 성형재료, Protective sheet(자동차, 건축, 전기)

난연제 사용법 : Glass Fiber(G/F) Reinforced PA 수지는 OMP-series 난연제가 사용되며 15% 정도 사용하면 만족스러운 난연성(UL-V0)을 얻을 수 있습니다.

Polymers: PA-6, PA-66, and PA-12

Principle applications: For electric and electronic materials, molding materials, and protective sheets (in automobile, construction, and electricity industries)

Use: Glass fiber (G/F)-reinforced PA resins require OMP-series flame retardant. The use of about 15% will produce satisfactory flame retardation (UL-V0).

### Polyester 수지 (Polyester resin)

Polymer : PBT, PET 등

주요 용도 : 전기/전자재료 (Injection mold, Lamp holder, Socket casing of capacitor and circuit-breaker)

난연제 사용법 : 15%의 OMP 단독처방으로 만족스런 난연성을 얻을 수 있지만 여건에 따라 다양한 난연제를 혼합한 복합형 맞춤형 난연제를 사용할 수도 있습니다. (당사의 맞춤형 난연제 참조)

G/F 강화 PBT, PET 수지의 경우 OMP-series 난연제가 사용되어야 합니다.

Polymers: PBT or PBT/PET

Principle applications: For electric and electronic materials (Injection moldings, lamp holders, socket casings of capacitors, and circuit-breakers)

Use: 15% OMP alone can provide satisfactory flame resistance; however, it can be combined with other flame retardants. (Please, see our tailor-made flame retardants)

For glass fiber (G/F)-reinforced PA resins, OMP-series flame retardants must be used.

### 에폭시계 수지 (Epoxy resins)

Polymer : Epoxy 또는 변성 Epoxy

주요 용도 : PCB, EMC, 콘덴서/코일 절연피복용, 건축자재 등

난연제 사용법 : OMP-800 단독 혹은 질소계 및 무기계 난연제를 혼합 사용하여 적절한 난연성을 얻을 수 있습니다. (맞춤형 난연제 참조)

Polymers: Epoxys

Principle applications: PCB, EMC, insulation coating of condensers and coils, and construction materials

Use: Suitable degrees of flame retardation can be obtained using only OMP-800 or a mixture of OMP-800 and nitrogen group, inorganic minerals. (Please, see our tailor-made flame retardants).

### FFC용 접착제 (Adhesive for FFCs)

Polymer : Hot-melt type Polymer

주요 용도 : Flexible flat cable

난연제 사용법 : OMP가 반드시 사용되어야 하며 당사의 MC를 적당량 혼합하여도 양호한 난연성을 발휘하며, 난연제는 톨루엔, DMF 등의 용매에 미리 분산시킨 뒤 가공이 용이해집니다.

Polymers: Hot-melt type polyesters

Principle applications: Flexible flat cables

Use: An OMP must be used; the mixture will display good flame retardation if a moderate amount of MC is added. Prior dispersion of this product in such solvents as toluene and DMF will makes the processing easy.

## OMP-900

Application :  
Engineering Plastic(EP)  
compounding

## OMP-800

Application :  
TPU, Polyolefin, TPE  
water/solvent borne coating

## PNF-100R

Application :  
TPU, Polyolefin, TPE  
water/solvent borne coating

Synergist  
Formulation product

## OMP-2101

Application :  
PA6, PA66 GF engineering plastic

## OMP-1101

Application :  
PET GF engineering plastic

Water dispersion product

## OMS-8050

Application :  
water borne coating

Synergist  
Formulation product

## PNF-740R

Application :  
TPU, Polyolefin, TPEwater/solvent borne coating

Individual products of Universal Chemtech

## • SPECIFICATION

Product Name		OMP-800	OMP-900	OMP-1101	OMP-2101	OMS-8050
Appearance		Fine, White crystalline powder				Slurry (White)
Phosphorus (wt%)		23 – 24	23 – 24	16 – 17	16 – 17	12.0 ± 0.5
Density (g/cm³)		1.1 – 1.2	1.1 – 1.2	about 1.3	about 1.6	about 1.0
Bulk density (kg/m³)		200 – 300	400 – 600	about 300	300 – 400	
Thermal decomposition (°C) (1% loss)		> 330	> 330	> 300	> 330	
Particle Size	(D50%, μm)	about 5	10 – 40	2 – 4	3 – 4	1 – 2
	(D98%, μm)	about 15	< 70	15–18	17–20	
pH(5% slurry, at 20°C)		4 – 5	4 – 5	4 – 5	4 – 5	4 – 5
Water/moisture (wt%)		0.2 (Max.)	0.2 (Max.)	0.4 (Max.)	0.5 (Max.)	about 50
Water Solubility (20°C) (g/100mL)		0.3 (Max.)	0.3 (Max.)	0.3 (Max.)	0.3 (Max.)	
Application		<ul style="list-style-type: none"><li>– Thermoplastic, thermoset resin</li><li>– Epoxy laminated for PCB</li><li>– Water/solvent borne coating</li><li>– TPU, Polyamide, PBT, PET, Epoxy, Unsaturated Polyester</li></ul>	<ul style="list-style-type: none"><li>– High temperature polyamide compounding</li><li>– Glass fiber reinforced and unreinforced for Engineering Plastics</li><li>– Thermoplastic compounding</li></ul>	<ul style="list-style-type: none"><li>– Thermoplastic elastomer such as TPU and TPE-E for cable</li><li>– Glass fiber reinforced and unreinforced for PET, PBT compounds</li></ul>	<ul style="list-style-type: none"><li>– High temperature Polyamide compounding</li><li>– Glass fiber reinforced and unreinforced for Polyamide compounds</li><li>– TPU cable</li><li>– Artificial leather</li></ul>	<ul style="list-style-type: none"><li>– Water borne coating and adhesive</li></ul>

Packaging : 10 kg paper bag coated with plastic and lined with PE



# PHOSPHOROUS AND/OR NITROGEN TYPE FLAME RETARDANT

## PNF-series

### 제품개요 PRODUCT OVERVIEW

PNF-series는 친환경 난연제의 일종인 Aluminum phosphinate계 난연제로서 특수한 표면처리로 내부식성이 뛰어나고 뭉침현상이 없어 각종 용도로 사용하는데 있어서 매우 편리합니다.

PNF series, the chemical compound of Aluminum phosphinate as a eco-friendly flame retardant feature exceptional corrosion resistance through special surface coating and high dispersibility.

### 장점 ADVANTAGE

- 대부분의 영역에서 뛰어난 난연성을 발휘
- 양호한 내열성(250℃ 이하 가공조건에서 안정)
- 각종 난연제와 배합 시 탁월한 시너지 효과 발휘
- 공극률이 작아 Polymer에 배합할 경우 수지의 비중변화가 매우 적음
- 고유한 코팅기술로 각종 수지에서 우수한 분산성 발휘
- PNF-100R은 화재시 유독성 가스를 방출시킬 염려가 전혀 없으며, 접착제 등에 혼합 시 점도 상승이 매우 적음
- Display exceptional flame retardation in most fields.
- Exhibit good heat resistance (stable under processing conditions of lower than 250℃)
- Achieve high synergies when in combination with various flame retardants.
- Give rise to little change in their specific gravity due to small porosity when they are added to polymers.
- Result in high dispersibility in various resins thanks to our proprietary coating technology.
- PNF-100R doesn't give off highly toxic gas in fire; there is a low risk of them leading to an increase in viscosity when it is added to any adhesives.

### SPECIFICATION

Product Line		Surface Modified Aluminum phosphinate	
Product name		PNF-100R	PNF-740R
Appearance		White Crystalline powder	White Crystalline powder
Density (g/cm <sup>3</sup> )		1.8	1.7
Bulk density (kg/m <sup>3</sup> )		700	600
Thermal stability (°C)		> 270	> 270
pH (5% Slurry, at 20°C)		3 - 4	3 - 4
Particle Size	(D50%, μm)	4 - 6 (Avg.)	3 - 5 (Avg.)
	(D95%, μm)	30 - 40 (Avg.)	30 - 40 (Avg.)
Property		-	Synergist
Application		- Thermoplastic resin compounding,(TPU, Polyolefin) - Water and solvent borne Adhesive,(Epoxy, UPR, Acryl, Urathane etc.)	

Packaging : 20 kg paper bag coated with plastic and lined with PE

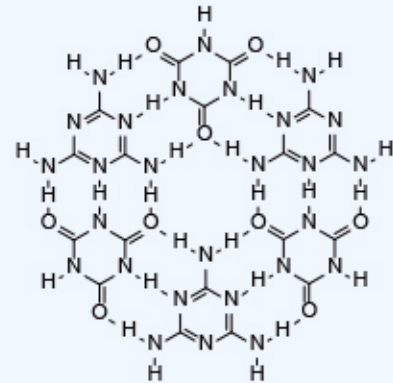
## MC-series

### ● 제품개요 PRODUCT OVERVIEW

MC-series는 비할로겐 난연제의 일종으로서 뛰어난 내열성(>300℃) 과 내수성을 지니고 있어 각종 수지에 배합하여 사용하는데 있어서 거의 제한받지 않는 친환경 난연제입니다.

질소를 포함하는 수지(Polyamide, Polyurethane 등)에서 우수한 난연성을 발휘하는 특징이 있고, 인계 또는 무기계 난연제와 함께 사용하면 높은 난연상승 효과를 발휘합니다.

MC-series products are eco-friendly non-halogen flame retardants that have exceptional resistance to heat (>300℃) and water, whose properties lead to almost unlimited application to various resins. They are characterized by excellent flame retardation when they are used in such nitrogen-containing resins as polyamides and polyurethanes; and they can greatly reduce costs due to their highly increased flame-retardation capability when they are used with phosphorous-based or inorganic flame retardants



Structural formula of melamine cyanurate

### ● 장점 ADVANTAGE

- 뛰어난 내열성(>300℃) 및 내변색성
- 우수한 내수성 및 내흡습성(장마철에도 수분흡수가 거의 발생하지 않음)
- 나일론(폴리아마이드), 우레탄 등 질소를 포함하는 수지에서 뛰어난 난연효과 발휘
- 에폭시, 불포화폴리에스터(UPR)등 열경화성 수지에서 우수한 난연성 발휘
- 우수한 전기적 특성으로 절연성을 요구하는 분야에 매우 적합함. 특히, MC-130P는 불순물 함량이 극도로 낮아 전자재료 분야에 매우 적합함
- MS-1020은 매우 미세한 입자로 구성된 수성 slurry로서 침전문제가 거의 발생되지 않아, 수성 접착제와 배합하여 EPS(Expanded polystyrene) 및 부직포 등에 적용하기에 매우 용이함
- Display excellent resistance to heat (>300℃) and discoloration.
- Have good waterproofness and moisture resistance (little or no chances of absorbing moisture even during the rainy season).
- Exhibit exceptional flame retardation in resins that contain nitrogen such as nylon polymers (polyamides) and urethanes.
- Produce good flame retardation in thermosetting resins such as epoxy and UPRs.
- Are suitable for applications that require good electric properties.
- Especially, MC-130P contains an extremely low amount of impurity and thus is ideal for application to electronic parts.
- MS-1020 is a water-soluble slurry of very fine particles that does not cause any precipitation problems, whose property enables easy application to EPS (expanded polystyrene) and non-woven fabrics when they are mixed with water-based adhesives.

# NITROGEN TYPE FLAME RETARDANT

## SPECIFICATION

List	Melamine Cyanurate (Conventional use)		Melamine Cyanurate (Electronic use)	Melamine Cyanurate (Water based use)
Product name	MC-110	MC-130	MC-130P	MS-1020
CAS No.	37640-57-6			
Formula	$C_6H_3N_3O_3$			
Appearance	fine, white, crystalline powder			White slurry
Specific gravity(g/cm <sup>3</sup> )	1.7			1.14
Bulk density(g/ml)	0.3			—
Particle size(D50%, $\mu m$ )	3-5(Avg.)			< 2
Surface Treatment	PVA	Stearic acid		PVA
Characteristics	Hydrophilic surface	Hydrophobic surface	Hydrophobic surface ion-free grade / Extremely low conductivity	Hardly settled narrow particle size distribution
Use	Polar resin such as PA, PU	non-Polar resin such as PE, PP, PS	Electronic part such as EMC, PCB	Water based adhesives

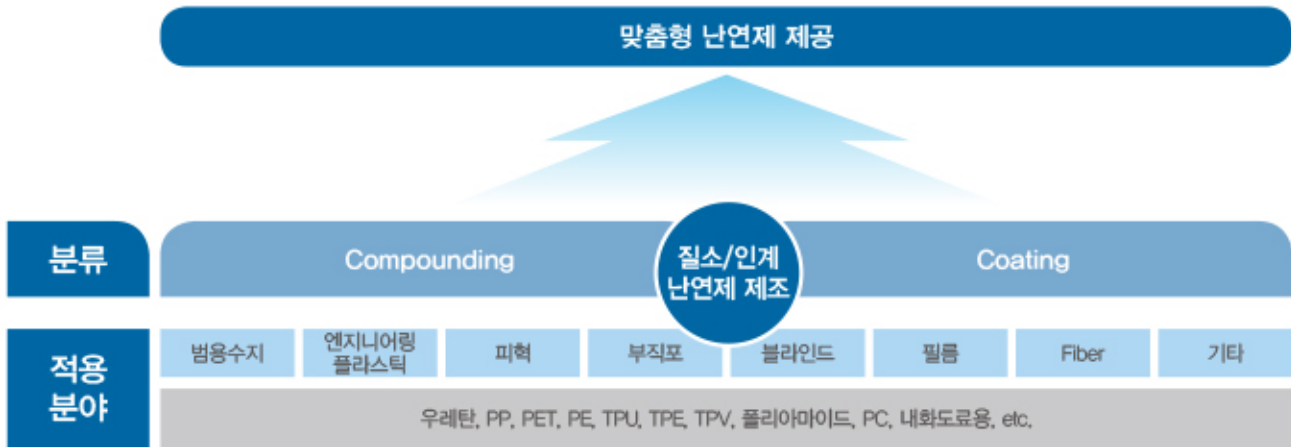
Packaging : 10 kg paper bag coated with plastic and lined with PE



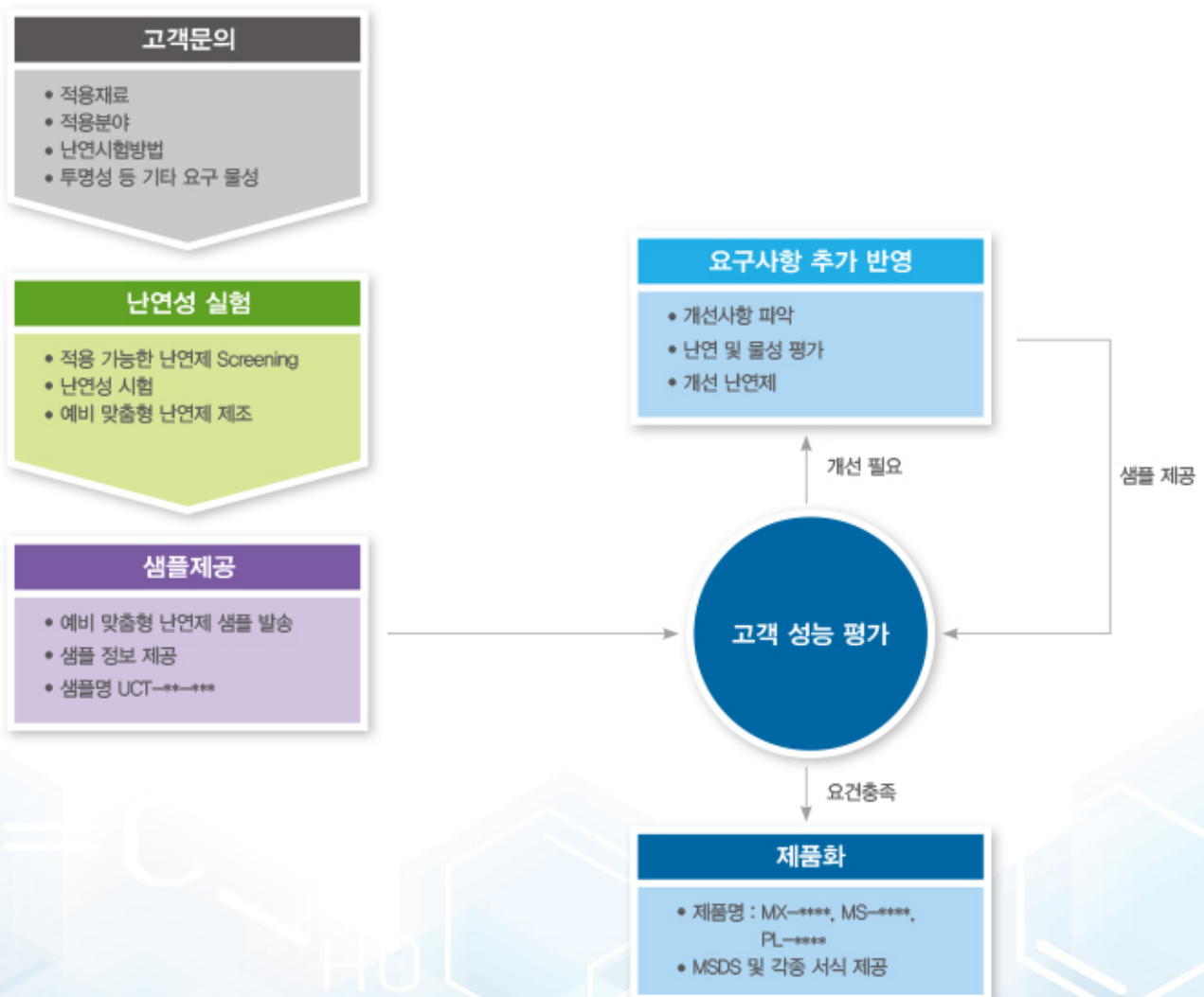


# 맞춤형 난연제 Tailor-made flame retardants

당사에서는 고객의 요구사항 및 생산환경에 따라서 국제기준의 맞춤형 난연제를 제공하고 있으며, 국내 난연제의 경쟁력 제고를 위해 해외의 우수한 난연제를 소싱하여 국내에 유통하고 있습니다.



## 맞춤형 난연제 개발 절차



## 맞춤형 난연제 Tailor-made flame retardants

### MX-2270

#### 제품개요 PRODUCT OVERVIEW

MX-2270은 비할로겐 친환경난연제로 질소(N), 인(P) 복합 난연제로서, RoHS를 만족시키며 6대 중금속 및 할로겐이 없는 제품으로 특히 Polyolefin에 적용할 경우 적은 량(15~29%)으로 UL 94 V-0를 구현할 수 있습니다.

비중이 낮고 연기발생이 적으며, 고난연성 발취와 장치 부식을 유발하지 않습니다.

MX-2270, the composite of nitrogen and phosphorus is eco-friendly non-halogen flame retardant that satisfies RoHS and has no Six heavy metals. When it applies to Polyolefin system, it is able to meet UL 94 V-0 (0.4mm, PP) in a small quantity(15%~29%). The product does not give off highly gas in fire; it has a relatively low density, excellent flame retardation and doesn't corrode the equipment.

#### 장점 ADVANTAGE

MX-2270은 Polyolefin 특히 PP 수지에 UL-V0의 난연성을 부여할 목적으로 개발된 난연제입니다.

MX-2270 is developed to resist to flamePolyolefin, especially Polypropylene in UL 94 class V-0.

Product Line	Phosphorus and Nitrogen type flame retardant
Product Name	MX-2270
Appearance	White Crystalline powder
Phosphorus (wt%)	3.5 - 3.9
Nitrogen (wt%)	39 - 41
Density (g/cm <sup>3</sup> )	1.6 ~ 1.7
pH (5% slurry, at 20°C)	3 - 4
Water/Moisture (wt%)	0.5(Max.)
Solubility (20°C) (g/100ml)	0.4 (Max.)
Viscosity (25°C, 10% Suspension)	50m Pa.s
Particle Size (D50%, $\mu$ m)	About 10
Decomposition Temperature (°C)	> 250

Packaging : 20 kg paper bag coated with plastic and lined with PE

# PRODUCT LIST

제품명	Appearance	Density (g/cm <sup>3</sup> )	P content (%)	N content (%)	Decomposition Temp (°C)	particle size (D50 μm)	비고
PP sheet용 (For PP sheet)	white powder	1.6	4	40	250	10	—
스폰지용 (For sponge)	water slurry	1.3	3	4	—	10	55% solids
자동차 부직포 코팅용 (For coating non- woven fabric of car)	water slurry	1.3	15	8.3	—	8	39% solids
TPU 전선용 (For wire or cable)	white powder	1.6	6	44	285	6	—
팽창흑연 날림 방지용 (To prevent blow of expanded graphite)	white powder	1.5	4	13	300	15	—
우레탄 코팅용 (For Urethane coating)	white powder	1.7	19	17	230	8	—
FFC(flexible flat cable)용	white powder	1.3	17	15	290	5	—
TPV용	white powder	1.5	10	21	280	5	—
건축용 화염확산 방지 Tape용 (For construction tape to prevent flame spread)	black/white mixture	1.8	9	5	230	60	—
선박바닥 코팅용 우레탄 (For coating Urethane on the vessel floor)	white powder	2.3	13	5	270	6	—







유니버살켄텍

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