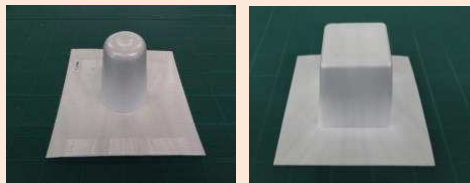


# 聚苯乙烯的未来

# Next Stage of Polystyrene : **PSplus**

<东洋苯乙烯的高功能性聚苯乙烯产品线> <Lineup of Toyo Styrene's High Functional Polystyrene>



冲压实例 Example of Deep Drawing



导光板 Light Guide Plate



热饮杯盖子 Lid for Hot Drink Cup

## 良好外观 PS

Good Appearance PS

导光板 Light Guide Plate

LED 照明 LED Lighting

标识牌 Signboard

## HMT-PS

(High Melt Tension PS)

(高熔融张力聚苯乙烯)

各种食品包装 Various Food Packages

泡沫冲压杯 Foamed Deep Drawing Cups

## ESCR-HIPS

(Environmental Stress Cracking Resistance)

(耐环境应力聚苯乙烯)

热饮杯盖子 Lids for Hot Drink Cup

油腻食品的包装 Food Packages for Oily Food

PS强度改善 Improvement of Strength

出色的透明性  
Excellent Transparency

发泡PS的优良成型性  
Good Moldability for Foamed PS

耐油性  
Oil Resistance

## 常规产品 Conventional GPPS/HIPS

耐热性  
Heat Resistance

低残留单体/低聚合物含量  
Minimize Residual Monomer/Oligomer

阻燃  
Flame Retardant

## TF-聚合物/TFP

可微波炉加热的食品容器  
Microwavable Food Packages

## 高纯度GP/HI

High Purity GP/HI

降低成型时的挥发

或减少容器的溶出物质

Reduction of Gas evolution at Molding  
or Eluted Materials from Packages

## 阻燃化PS

Flame Retardant PS

含卤/无卤 Halogenated/Halogen-free

阻燃化PS Flame Retardant Compound PS



午餐盒  
Lunch Boxes



“盖饭”包装  
Package for "DONBURI"



墨粉盒  
Toner Container



配电盘  
Distribution Board



低单体残留容器  
Packages of Low Volatile Monomer



低低聚物残留容器  
Packages of Low Oligomer

在保有聚苯乙烯优点的同时

## 实现近于丙烯的高透明!!!

轻质

优良的外观

不易变黄

不易弯曲

### 日常用途 (Applications)

- 导光板等光程较长的光学材料  
Light guide plates

(例如) · 照明器具

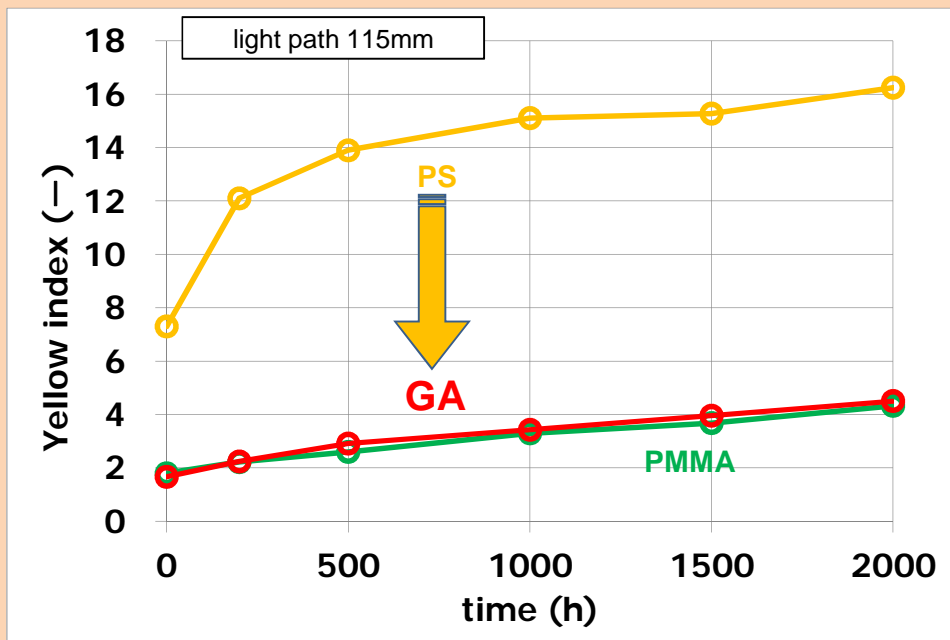
Lightings , Optical Components etc

· 电视, 个人电脑等的显示器

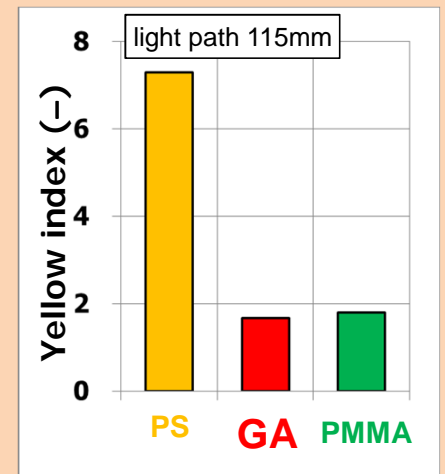
TV , Monitors such as PCs

### ◆ 特征 (Characteristic)

加热到80°C的试验 (色相的经时变化)



色相试验



### ◆ 特性比较 (Property Comparison)

	PS	GA	PMMA
比重 (Specific gravity)	◎	◎	△
耐吸湿性抗变形 (Moisture absorption-resistant)	◎	◎	×
成型性能 (Formability)	◎	◎	○
透明度 (Transparency)	○	○⇒◎	◎
耐冲击性 (Impact strength)	○	○	○
色相的经时变化 (Aging Yellowing)	×	◎	◎
发黄 (Yellowness)	△	◎	◎

◎: 优秀(Excellent) ○: 良好(Good) △: 普通(Fair) ×: 不好(Poor)

# 高熔融张力聚苯乙烯 (HMT-PS) High Melt Tension Polystyrene

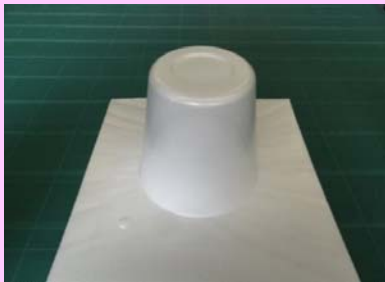
HMT-PS使用了我们独有的聚合技术，熔融张力非常高。

HMT-PS has very high Melt Tension by our own polymerization technology.

- 是用来制造薄板/薄膜的理想材料。 Good material for SHEET/FILM productoin.
- HMT-PS的成型产品具有良好的可成型性和厚度均匀性。  
Forming productions of HMT-PS have good FORMABILITY, THICKNESS UNIFORMITY.

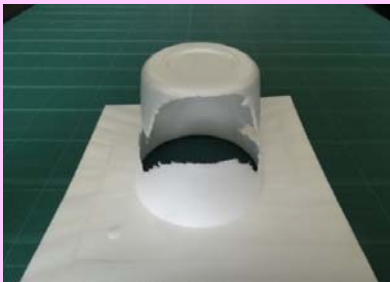
## ①PSP 成型测试 Forming

高应变硬化 High strain-Hardening



HMT-PS

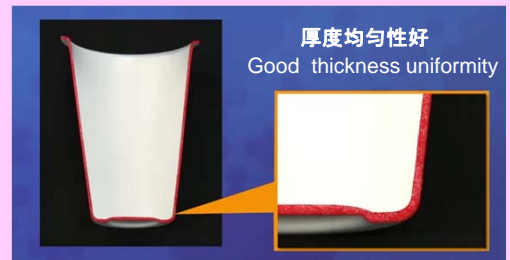
低应变硬化 Low strain-Hardening



通用级 Conventional PS

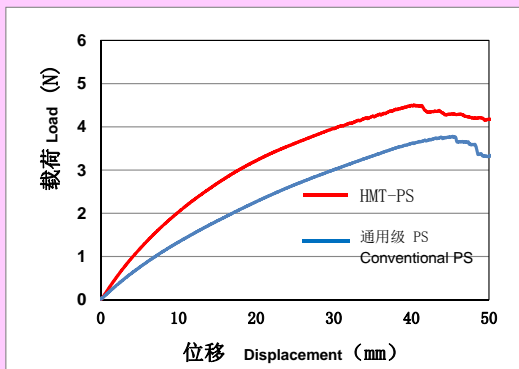
## ②食品包装容器厚度均匀性

Food container thickness uniformity



HMT-PS容器的断面  
Cut surface of HMT-PS Container

## ③食品包装容器的抗压强度 Compression strength of food container



测量方法 Measuring method



## ④用途 Application

- PSP: 聚苯乙烯纸 (用于食品包装容器的成型膨胀板)  
PSP: Polystyrene Paper  
(Foamed expansion sheet for food container)
- 膨胀聚苯乙烯板 (泡沫隔热材料)  
XPS: Expanded Polystyrene board  
(Foamed heat insulation material)
- 双向拉伸聚苯乙烯  
BOPS: Biaxial Oriented Polystyrene
- 注射吹塑成型产品  
Injection blow formed productions
- 吹胀膜  
Inflation films with HIPS
- 聚苯乙烯板成型包装  
HIPS sheet formed package

# 耐油性HI-聚苯乙烯 (EX7) Oil Resistance HI Polystyrene (EX7)

EX7性能非常适合真空成型的咖啡杯盖

EX7 shows optimum performance as a material for vacuum forming Coffee cup lids

占日本咖啡杯盖市场份额  
No.1

Japan's coffee cup lid market  
Top Share

※弊社公司估算  
by Toyo Styrene estimate

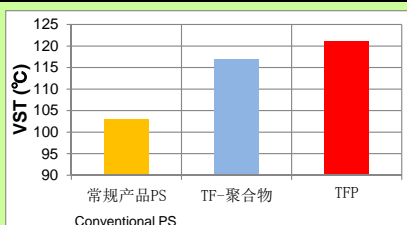


- ①良好的耐油性 Good oil resistance  
防止因牛奶中的成分腐蚀开裂  
Prevention on cracking due to milk fat
- ②高刚性、优异的尺寸稳定性  
Highly rigid, Maintaining dimensional stability
- ③高撕裂强度、高耐折强度  
Good tear strength, Good folding endurance

不同材质咖啡杯盖性能对比表 Performance comparison for coffee cup lid

项目 Item	EX7	HI-PS+SBR	PP
抗牛奶腐蚀 Resistance to milk	优秀 Excellent	一般 Fair	优秀 Excellent
成型性能 Moldability	良好 Good	良好 Good	较差 Poor
加工性能 (尺寸稳定性) Dimensional stability at the molding	良好 Good	良好或一般 Good or Fair	较差 Poor
刚性 Stiffness	良好 Good	良好或一般 Good or Fair	较差 Poor
厚度 Thickness	薄 Thin	厚 Thick	厚 Thick
重量 Weight	轻 Light	重 Heavy	重 Heavy
成本 Cost	良好 Good	一般 Fair	一般 Fair

# 耐热性聚苯乙烯 (TF & TFP) Heat Resistance Polystyrene (TF & TFP)



耐热性测试结果 Result of heat resistance test



用途: 可微波烹调的食品包装等  
Application: Microwavable Food Package, etc.

# 东洋苯乙烯的阻燃聚苯乙烯的谱系 Flame Retardant Polystyrene

东洋苯乙烯的阻燃PS，是阻燃聚苯乙烯，在严格管理的基础上保持高质量水平。

Toyo Styrene Flame Retardant PS is a polystyrene resin with a certain flame-retardant.

拥有卤化阻燃塑料及非卤化阻燃塑料的各种等级。

By the flame-retardant class, we have not only V-2/V-0 series but also 5VA that is usually difficult in PS systems.

各阻燃级别中除V-2、V-0之外，还有通常PS系难以达到的5VA。分别被家电、OA设备、住宅设备等依据需求采用。

It has been adopted in response to needs such as consumer electronics, OA equipments and housing equipments.

我们将及时准确地回应客户的各种需求，并向市场供应高质量和高功能的产品。

We will provide high quality and highly functional products

## ◆ 代表牌号摘录 Representative grade

	V-2	V-0	5VA
卤素 Halogen	LH30 (0.8mm) LF21 (0.8mm)	FS 100S (1.5mm) NBW160-1 (1.5mm)	ES150 (1.5mm)
无卤素 Non-Halogen	LX20 (0.8mm)	-	-

**世界首例** 具备阻燃性能的聚苯乙烯塑料 卤素型「ES150」 UL standard "1.5mm/5VA"  
The world's-first performance<sup>(\*)</sup>

(\*) SPS (同规聚苯乙烯) 除外 except for SPS

具备最高级别的阻燃性能 (5VA) 和优异的耐光性，东洋苯乙烯充满信心的阻燃规格 FRPS of the TOYO STYRENE confidence having highest flame retardant performance and superior lightfastness.



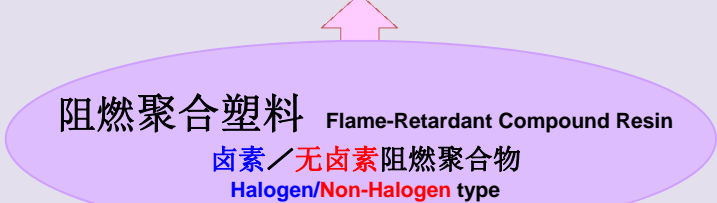
电表箱 Wattmeter box



空调电气箱 Electrical box for air conditioner



打印机 Printer



高循环·高耐热蠕变

High Cycle Molding and High Heat Creep Endurance

无卤素型 Non-Halogen type : LX20 (V-2)  
卤素型 Halogen type : LH30 (V-2)



硒鼓容器 Toner Container

高流动·良耐热

High Flow and Good Heat Resistance

卤素型 Halogen type : FS100S (V-0)



液晶电视一后盖 LCD TV-B/C

热稳定·超耐光

Heat Stability and Super Light Resistance

卤素型 Halogen type : LF21 (V-2)  
ES150(5VA)



复印机 Copying Machine

## 用于挤塑泡沫板的阻燃母料 MBX150

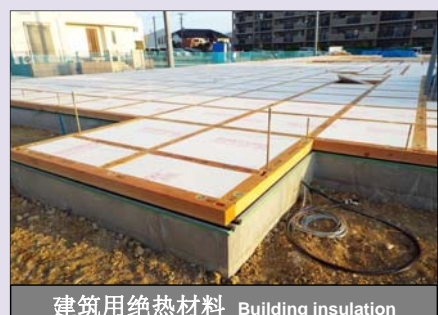
Flame retardant master batch for XPS board

于挤出泡沫板应用的高浓度型阻燃母料树脂具有优异的热稳定性

High thermal stability & high concentration



建筑用绝热材料 Building insulation



建筑用绝热材料 Building insulation

■ 热稳定性比较 Comparison of thermal stability

条件	MBX150	比较材
220°C×45min		
220°C×60min		