



# DIC Engineering Plastics (DIC EP)

## Introduction of DIC-PPS FZ-3600-H5 Black Anti-Hazing Grade

# Background

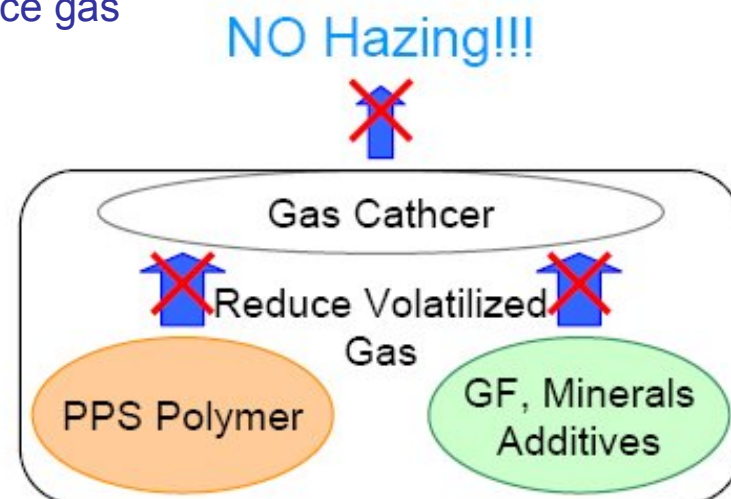


- Decrease Hazing under High Application Temperature.
- Expected Applications:
  - Lamp holder, Chassis, Housings, Sockets, Connectors.
  - Applications requiring low outgas (e.g. Beamers)
  - Parts in Hard Disc Drive

# Anti Hazing Grade



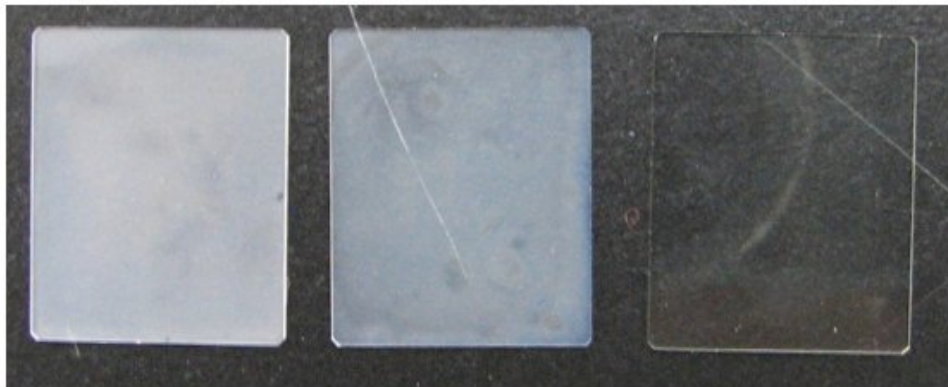
- Problem: Hazing on mirror or glass parts can occur around lamps after long term operation time.
- Effects of the problem:
  - Bad outlooking
  - Decrease wavelength
  - Transform wavelength
- Route cause:
  - Micro amounts of volatilized gas from PPS base polymer, GF & Mineral fillers, additives
- Solution:
  - Use of High Purity PPS Polymer
  - Best Composition of fillers and additives to reduce gas
  - Improve gascatcher additives



# Hazing properties of FZ-3600-H5



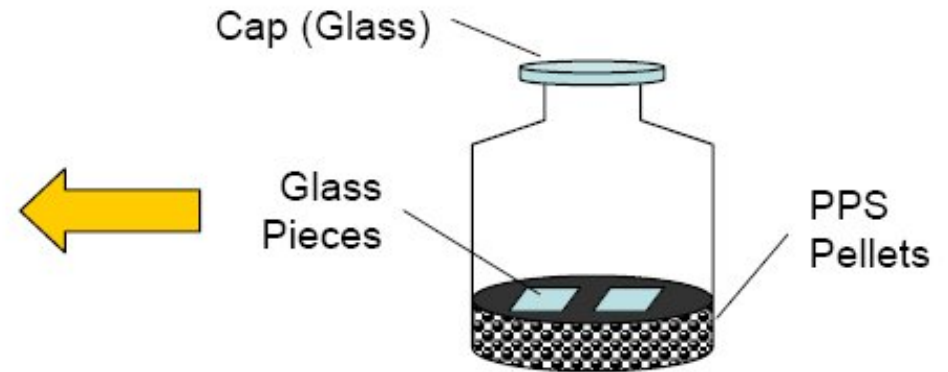
210°C, 1100 hours **No haze!!**



Competitor  
General PPS

DIC  
FZ-3600-D5 BLACK

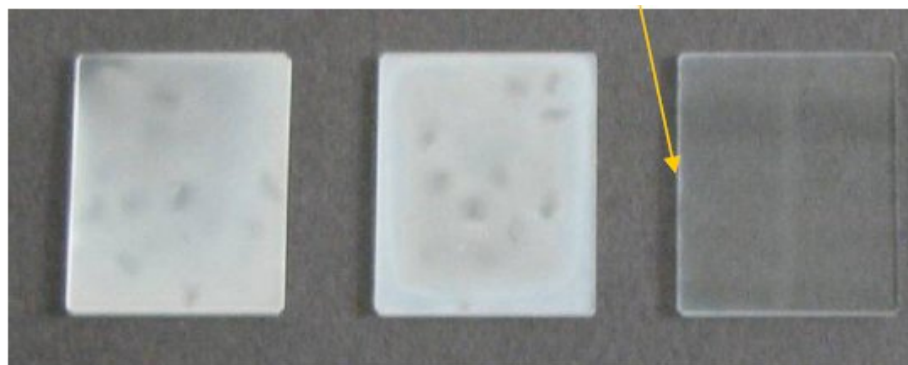
DIC  
FZ-3600-H5 BLACK



## Evaluation:

- Put 100 g of PPS pellets and glass test piece into bottle and close it by a glass sheet
- Hold in circulation heater.
- After holding time, check the glass test pieces in the bottle.

250°C, 1200 hours **A little haze at the edge.**



Competitor  
General PPS

DIC  
FZ-3600-D5 BLACK

DIC  
FZ-3600-H5 BLACK

# Properties



Grade Name			FZ-3600-H5 BLACK	FZ-3600-D5 BLACK	FZ-3600 BLACK
			Low Outgas	High Strength	General
	Method	Unit			
<b>Physical Properties</b>					
Specific Gravity	ASTM D792	-	1.98	1.88	1.96
Water Absorption	ASTM D570	wt. %	0.02	0.02	0.02
Mold Shrinkage (MD/TD)*1	ASTM D955	%	0.25/0.9	0.25/1.0	0.25/1.0
<b>Mechanical Properties</b>					
Tensile Strength	ASTM D638	MPa	130	140	125
Tensile Elongation at Break	ASTM D638	%	1.0	1.0	0.8
Flexural Strength	ASTM D790	MPa	200	230	200
Flexural Modulus	ASTM D790	MPa	18000	17000	17500
Flexural Elongation at Break	ASTM D790	%	1.2	1.6	1.3
Izod Impact Strength with Notch	ASTM D790				
	ASTM D256	J/m	70	85	70
w/o Notch	ASTM D256	J/m	260	320	260
<b>Thermal Properties</b>					
Deflection temperature	ASTM D648	°C	265	265	265
Co-eff. of T.E. (<100°C)	ASTM D696	m/mK	$1.7 \times 10^{-5}$	$1.8 \times 10^{-5}$	$1.7 \times 10^{-5}$
UL Flammability (t ≅ 0.8mm)	UL-94	-	V-0	V-0	V-0
<b>Electrical Properties</b>					
Dielectric Strength *2	ASTM D149	kV/mm	16	16	16
Volume Resistivity	ASTM D257	Ω • cm	$10^{16}$	$10^{16}$	$10^{16}$
<b>Processing Properties</b>					
Mold Flow *3	DIC Way	cm	38	45	37
<b>Processing Condition</b>					
Cylinder Temperature		°C	300-340	300-340	300-340
Mold Block Temperature		°C	120-150	120-150	120-150

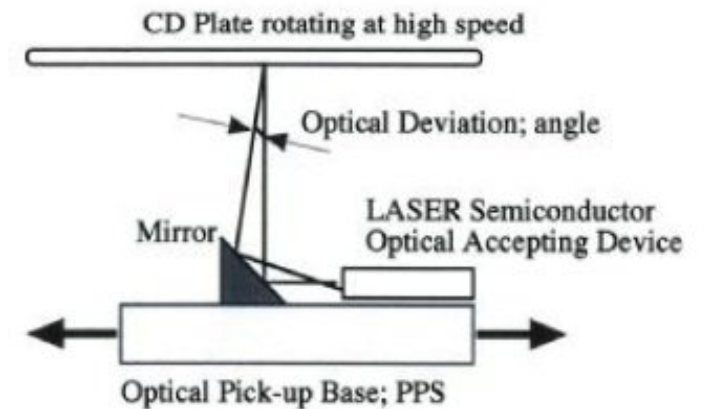
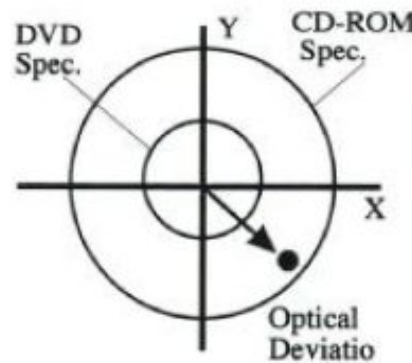
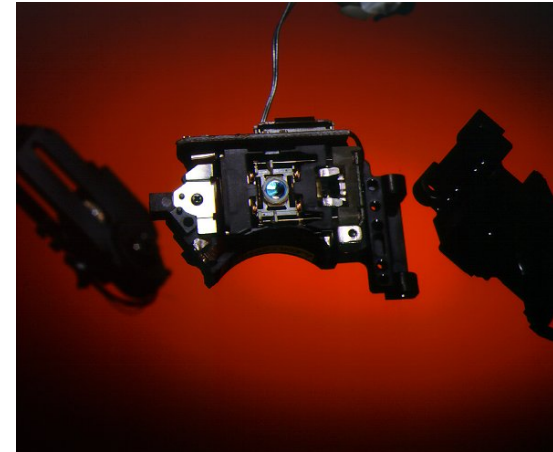
\*1 MD; Mold Direction, TD; Transverse Direction \*2; t=1.6mm

\*3 Cylinder Temp.: 330°C, Mold Block Temp.: 150°C, t=1.6mm

# Potential Application: Pick-up Slide Base for CD & DVD



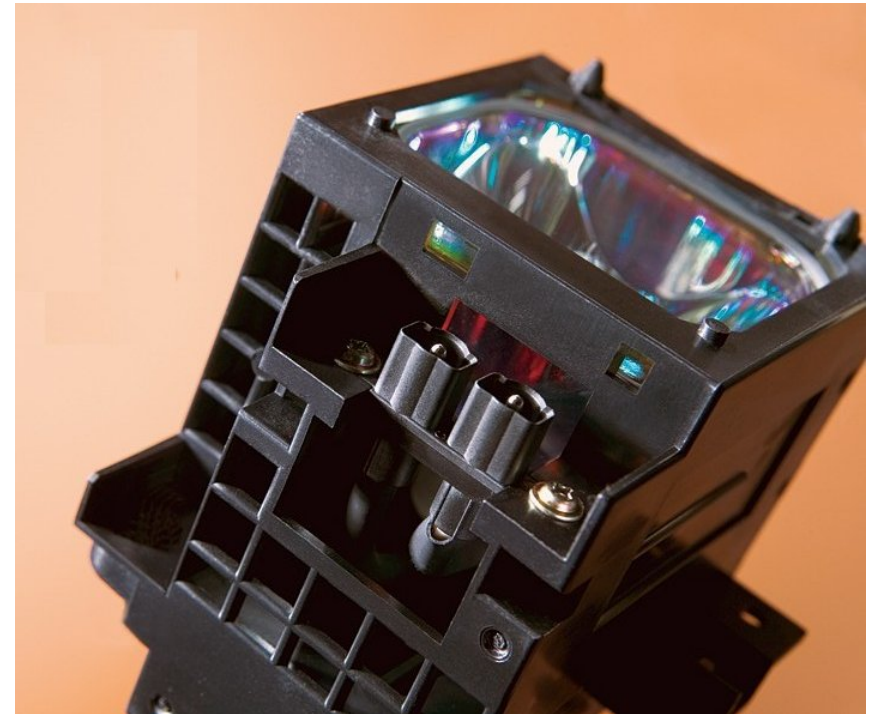
- Traditional Materials:
  - Metal, Al or Zn Die-Casting
- Main Requirements:
  - High Rigidity and High Density
  - Dimensional Stability under various environments
  - Cost Savings
  - Precise Molding



# Potential Application: Lamp Housings



- Lamp Housing
  - LCD projector & LCD projection TV
- Main Requirements:
  - Heat Resistance
  - Low Out-gas at elevated temperature
  - High Strength and Modulus
  - Dimensional Stability





Thank you very much for your attention!

## Contact in Europe

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