

HYOSUNG CHEMICAL

POKETONE in Railway Industry

**Non Toxic
High Efficiency**

EARTH FRIENDLY

- Acrylate Free
- Melamine Free
- Bisphenol A Free
- Formaldehyde Free
- Lead/ Chrome/ Free
- Phthalate Free

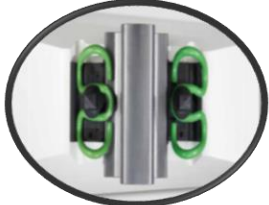
Global Warming Potential

• PA6	6.70
• PA66	6.40
• PC	3.40
• POM	3.20
• ABS	3.10
•• PK	3.08

(kg CO₂ eq)

• Other ETP data is based upon the Eco-profiles data from www.plasticseurope.org

• PK Data is based upon Korea LCI database and Ecoinvent database.



Further Information
www.poketone.com

POKETONETM
HYOSUNG POLYKETONE

■ **POKETONE** is a family of semi-crystalline aliphatic Polyketone, made of CO and olefins

- Low water absorption and high chemical resistance
- Good wear/abrasion resistance and NVH(Noise, Vibration, Harshness) performance
- Balanced properties: tensile strength, impact strength and elongation
- Short cycle time for injection molding

■ **POKETONE is TOUGH ENOUGH for Railway Parts Industry**

POKETONE™ is Hyosung's brand name for Semi-crystalline aliphatic Polyketone and is used in railway parts industry that requires superior impact strength, tensile strength and electronic insulation property.

Thanks to its balanced properties, POKETONE™ can cover a variety of railway parts. POKETONE™ can be a solution for various railway parts.



► PK in Railway Parts Industry

1) **Insulation block for E-clip** (Korea Railroad Corporation)

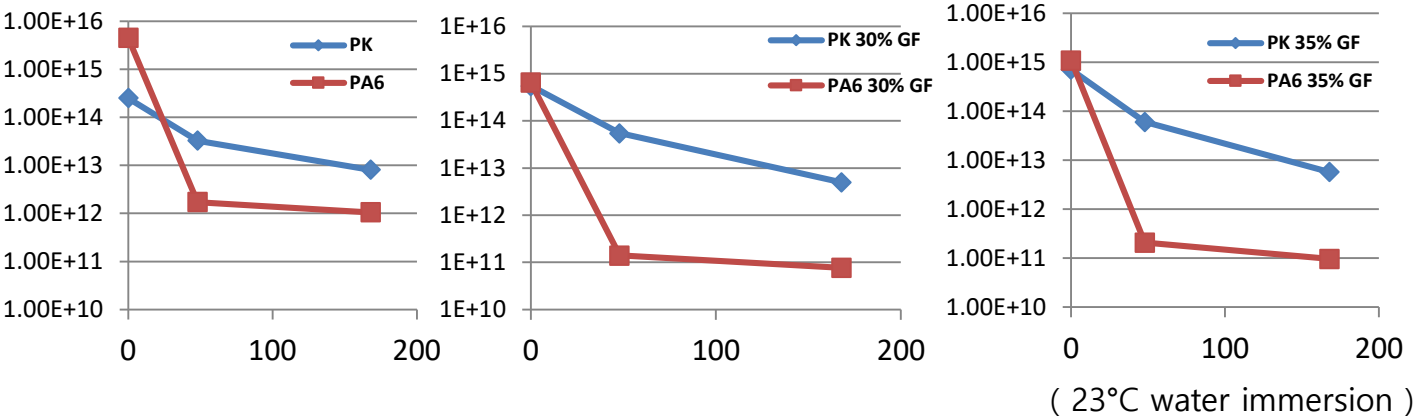
2) **Rail fastener components** (Korea Railroad Corporation)

-PK grade: M33AG6V-NP0, M630V

■ **Why POKETONE can replace PA in railway parts industry?**

- 1) POKETONE shows low water absorption and dimensional stability compared to PA
- 2) POKETONE shows better physical property retention after weatherability test compared to PA
- 3) POKETONE shows more higher impact strength compared to PA
- 4) POKETONE improves electronic Insulation performance in wet condition compared to PA

1. POKETONE shows better electrical insulation performance in wet condition compared to PA

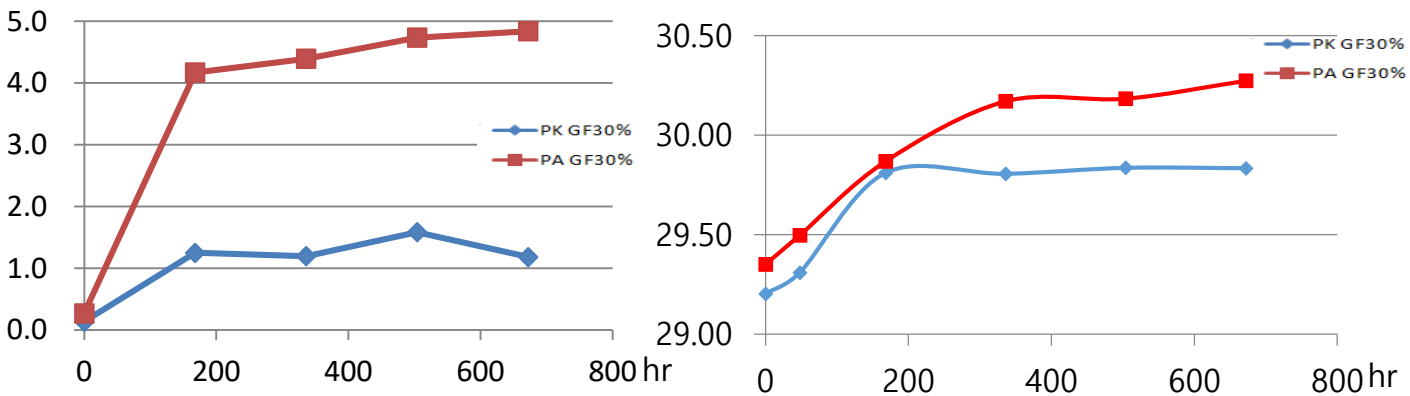


Time	Volume Resistivity(Ω·cm)					
	PK	PA	PK+GF30	PA6+GF30	PK+GF35	PA6+GF35
0 hr	2.50E+14	4.48E+15	5.53E+14	6.58E+14	7.08E+14	1.08E+15
After 48 hrs	3.24E+13	1.71E+12	5.47E+13	1.40E+11	6.03E+13	2.07E+11
After 168 hrs	8.04E+12	1.05E+12	5.00E+12	7.67E+10	5.71E+12	9.58E+10

2. POKETONE shows low water absorption and better dimensional stability compared to PA

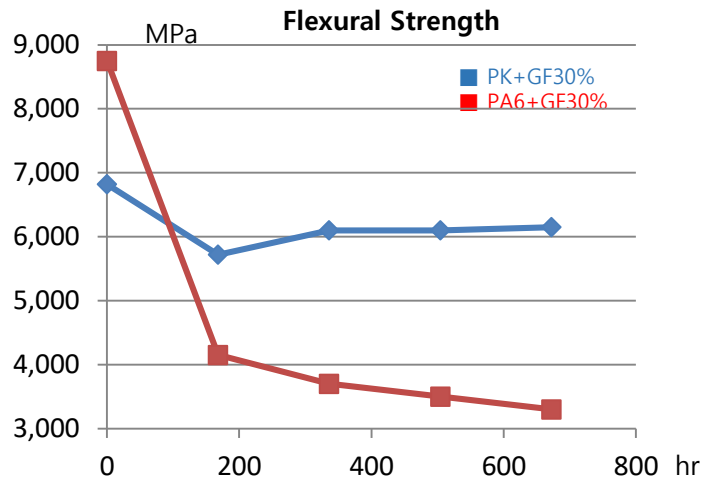
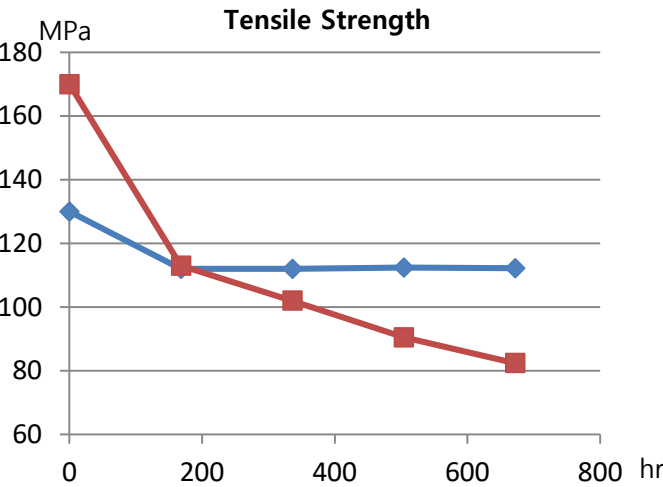
Water absorption (%)

Volume(cm³)



Material	Water Absorption (%)
	672hr
PK+GF 30% BLK	1.18
PK+GF 35% BLK	1.08
PA6+GF 30% BLK	4.84
PA6+GF 35% BLK	3.99

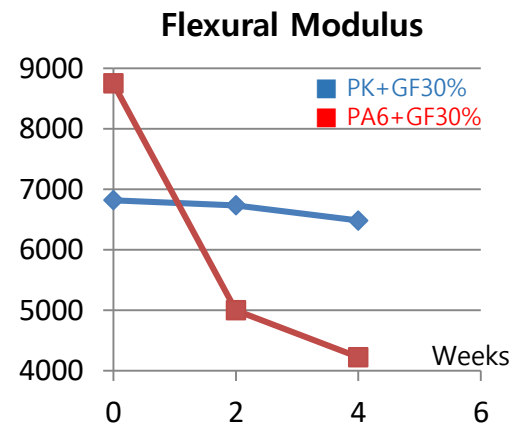
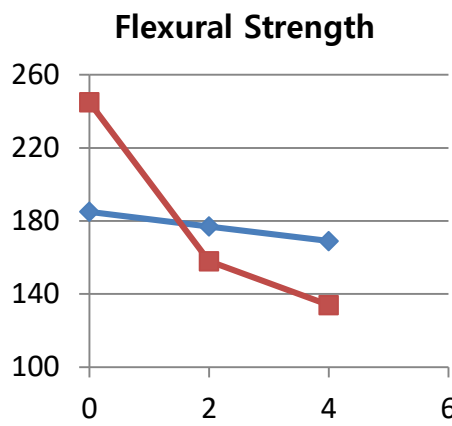
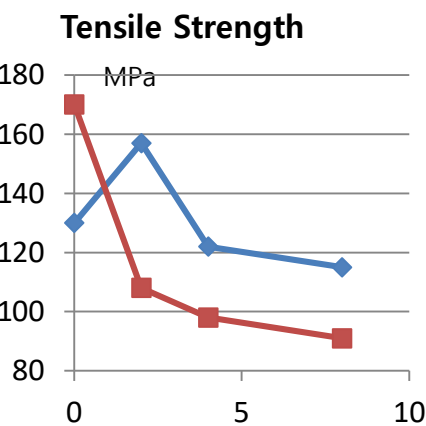
3. POKETONE has better physical properties retention rate after immersion in water compared to PA



Material	Tensile Strength (Mpa)			Flexural Strength (Mpa)			Flexural Modulus (Mpa)		
	168hr	672hr	Retention Rate(%)	168hr	672hr	Retention Rate(%)	168hr	672hr	Retention Rate(%)
PK+GF 30% BLK	112	112	86	163	166	90	5,720	6,150	90
PK+GF 35% BLK	122	121	90	173	180	88	6,720	7,200	92
PA6+GF 30% BLK	113	82	48	145	103	42	4,150	3,300	38
PA6+GF 35% BLK	124	94	52	160	123	47	5,050	4,200	43

(23°C water immersion)

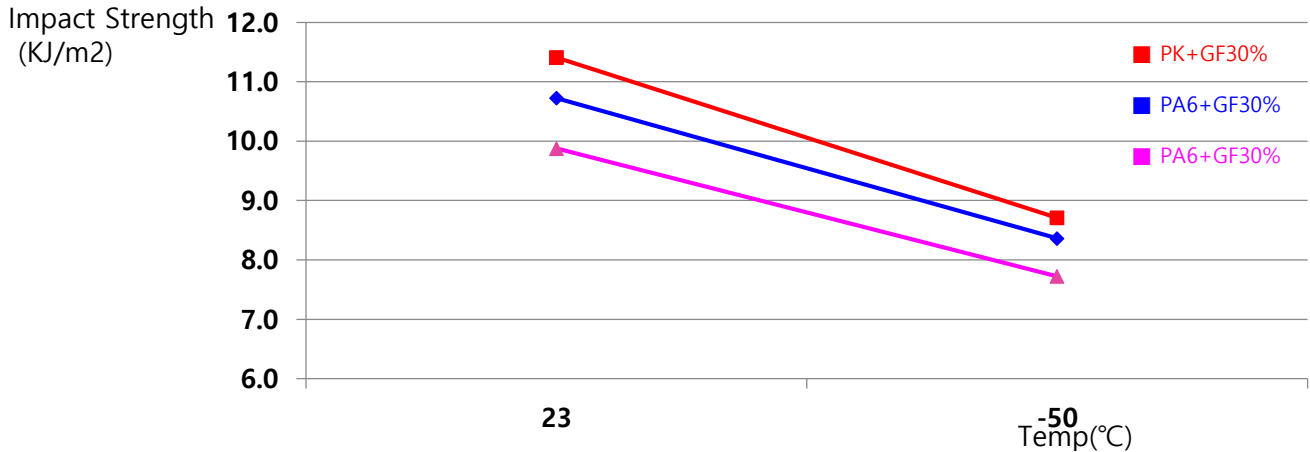
4. POKETONE has better physical properties retention rate after weatherability test compared to PA



Material	Tensile Strength (MPa)					Flexural Strength (MPa)				Flexural Modulus (MPa)			
	week				Retention Rate(%)	week			Retention Rate(%)	week			Retention Rate(%)
	0	2	4	8		0	2	4		0	2	4	
PK+GF30% BLK	130	157	122	115	94%	185	177	169	92%	6820	6735	6483	95%
PA6+GF30% BLK	170	108	98	91	57%	245	158	134	55%	8750	5000	4225	48%

5. POKETONE shows higher impact strength than PA6

(Test Method : ISO 179/1eA , Charpy Notched)



Product	Charpy Notched Impact Strength (KJ/m ²)	
	23°C	-50°C
PK+GF30%	10.7	8.4
PK+GF35%	11.4	8.7
PA6+GF30%	9.9	7.7

Certifications and Approvals



Eco-friendly material

GWP	**PK	*ABS	*POM	*PC	*PA66	*PA6
Figure	3.08	3.10	3.20	3.40	6.40	6.70

- POKETONE™ is eco-friendly with low Global Warming Potential. (lower than PA66, POM)
- POKETONE™ is non-toxic: no VOCs (Volatile Organic Compounds), free of formaldehyde, heavy metal and acrylonitrile
- Perfect for baby toys, food contact and medical applications. All F grades of POKETONE are satisfied with FDA, NSF 51,61, and USP Class VI.



· Excellent Wear Resistance · Low Noise · Low abrasion loss (no particle) · Excellent chemical resistance

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