for a better future

KEP

Introduction of
KEPITAL® TE-22S, TE-23S

R&D Center

KOREA ENGINEERING PLASTICS CO.,LTD.

1. Characteristics

KEPITAL® has outstanding mechanical properties which are basic in plastic materials and with the highest fatigue resistance and resistance to creep, it shows superior ability in the field affected by loadings and vibrations. In addition, by significantly improving impact properties, KEPITAL® TE grade which can endure impact from inside and outside is produced.

KEP has developed KEPITAL® TE-22S, 23S by balancing mechanical properties and impact properties and improving weld-lines, through dedicated research and development with the goal of satisfying customers.

It is expected that KEPITAL® TE-22S, 23S will solve the problems resulting from design limitations. In the various fields of automobiles, electronic instruments, and general industry, KEPITAL® TE-22S, 23S is expected to play a leading role in successful development and satisfactory results.

2. Comparison with existing products

With superior balance in physical properties and improved weld-lines compared to existing KEPITAL® TE-22 and 23 impact resistance-grade, product design limitations will be reduced and convenient use condition will be provided.

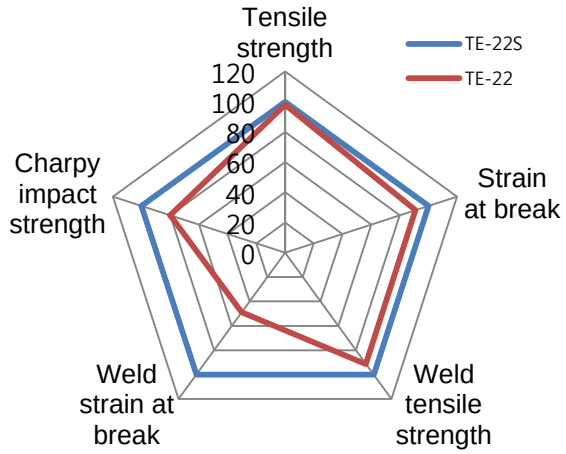


Figure 1. Comparison of TE-22 & TE-22S

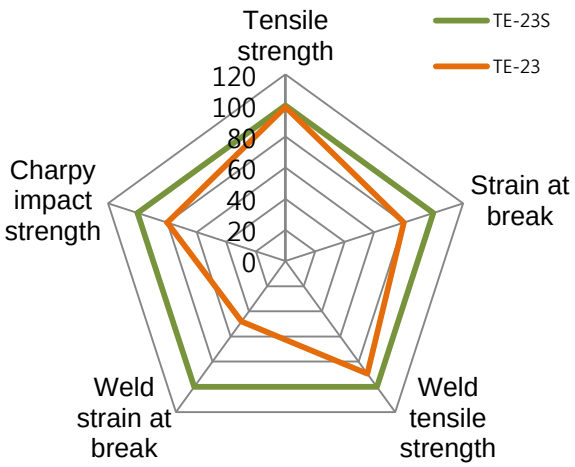


Figure 2. Comparison of TE-23 & TE-23S

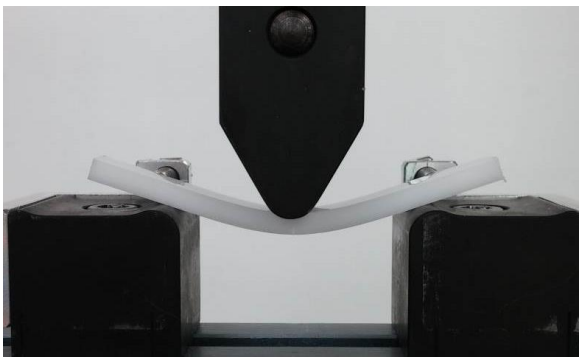


Figure 3. TE-23S Flexural strength(At weld)

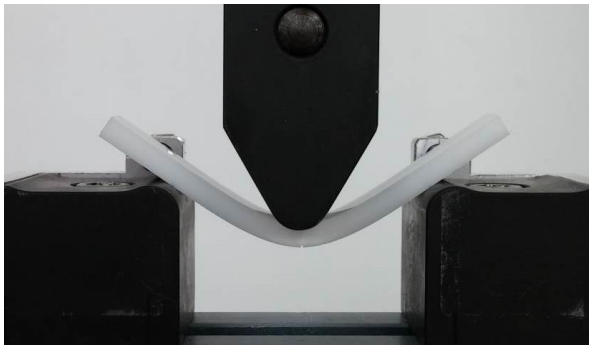


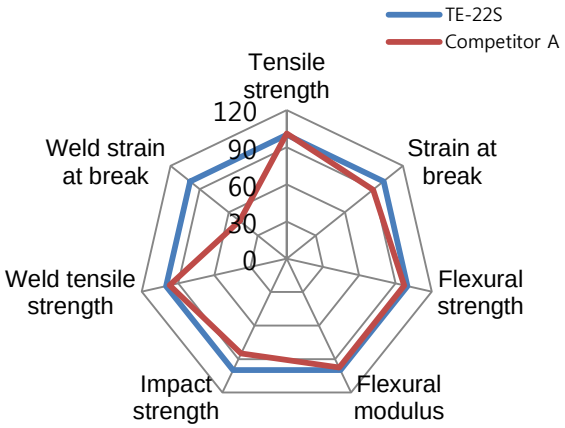
Figure 4. TE-23 Flexural strength(At weld)

TE-23S shows superior weld strain performance over TE-23, tested by weld specimen.

3. Comparison with competitors' products

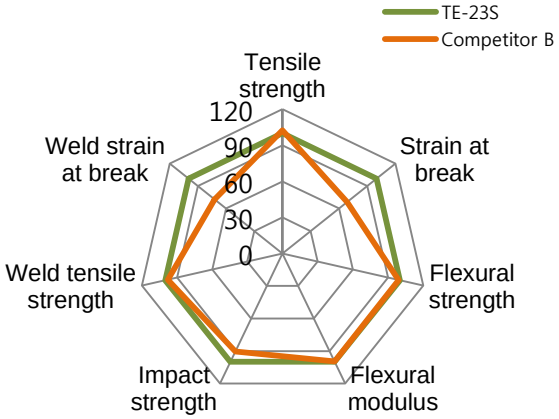
(1) Superior balance of physical properties compared to other product

While tensile strength and basic properties are maintained, impact strength is 17% higher than that of competitors' products and about two times higher performance is exhibited at weld-lines. This will increase the convenience and rationale in selecting materials and designs.



(Base line : TE-22S data)

Figure 5. Comparison TE-22S & Product A graph

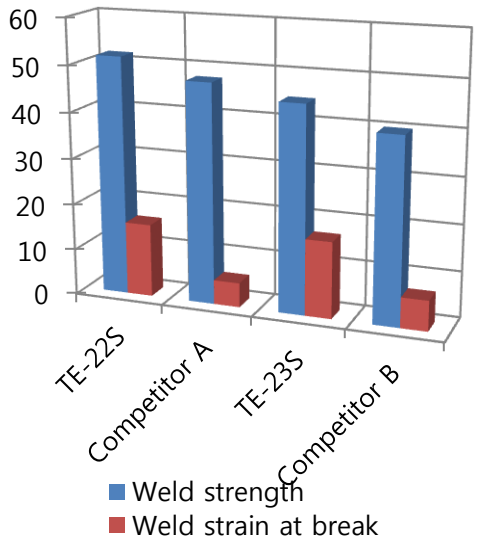


(Base line : TE-23S data)

Figure 6. Comparison TE-23S & Product A graph

(2) Weld properties

Weld-lines are the type of junction where separated flows of resin and meet again. Weld-lines are naturally weak and brittle regions. Particularly, general impact resistance grades exhibit weak stiffness and elongation at this weld-line. This causes limits in design and development of molds. KEPITAL TE-22S, 23S are supplemented in this point to enhance stiffness and elongation of weld-lines while maintaining other physical properties. This helps to reduce considerations about design, structural properties, and effects of molding.



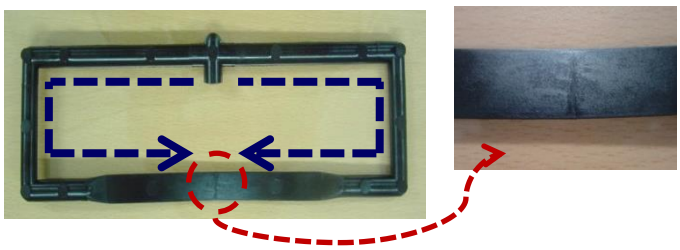
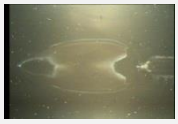
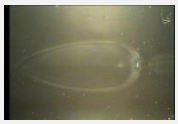
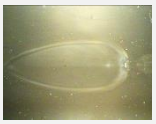


Figure 7. Comparison of weld properties and methods to mold specimens

(3) Mold Deposits

In the injection process, maintaining machines, facilities and molds becomes important. Due to the gas from resins when plasticized in injection machines with high temperatures, the surface of molds become contaminated and problems such as incomplete forming and exterior defects can be caused. One of the problems of maintaining molds, mold deposits, can lead to defects unless removed. Therefore, continuous maintenance is needed. Mold deposits of KEPITAL® TE-22S, 23S can be removed easily compared to competitors' products. Like the pictures above, in molds without vents, mold deposits form with the shape of the injection molded parts. Mold deposits of TE-22S and TE-23s can be cleaned with common gloves, but competitor' products cannot. KEP always try to improve quality and also to satisfy customers from customers' perspectives.

Grade	Before Cleaning	After Cleaning
TE-22S		
Product of Competitor A		
TE-23S		
Product of Competitor B		

Footnote) Injection molding condition: melt temperature 200 ℃, mold temperature 70 ℃, Shot: 400

4. Mechanical Properties

Properties		Test method	unit	TE-22S	TE-23S	Remarks
Density		ISO 1183	g/㎤	1.38	1.36	
Melt flow rate		ISO 1133	g/10 min	3.6	3.2	
HDT (1.8MPa)		ISO 75	℃	83.0	76.5	
Tensile strength		ISO 527	MPa	51	45	
Tensile elongation			%	50	65	
Flexural strength		ISO 178	MPa	70	60	
Flexural modulus				2,000	1,750	
Charpy impact strength (Notched)	23 ℃	ISO 179	kJ/㎡	14	18	
	-30 ℃			7.0	7.0	
Weld strength		-	MPa	52	45	
Weld elongation			%	12	10	

5. Applications

Seat belt components

Stroller components

Helmet joints

Clips

Buckles

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