

**Technical Data Sheet**

**SAN(Styrene Acrylonitrile)**  
**SAN 310TR**

**Features** High transparency, High toughness

**Applications** Hanger, Mixer, Pitcher

<b>Physical</b>		<b>Test Method</b>	<b>Value</b>
Density		ASTM D792	1.07 g/cm <sup>3</sup>
Melt Flow Index (230°C, 3.8kg)		ASTM D1238	10.0 g/10min
	(200°C, 5.0kg)	ASTM D1238	3.0 g/10min
Mold Shrinkage		ASTM D955	0.2 ~ 0.6 %
Water absorption		ASTM D570	0.3 %

<b>Mechanical</b>		<b>Test Method</b>	<b>Value</b>
Tensile Strength		ASTM D638	660 kg/cm <sup>2</sup> (9,372) (psi)
Elongation		ASTM D638	4.5 %
Flexural Strength		ASTM D790	950 kg/cm <sup>2</sup> (13,490) (psi)
Flexural Modulus		ASTM D790	34,200 kg/cm <sup>2</sup> (485,640) (psi)
Izod Impact Strength(3.2mm)		ASTM D256	1.5 kgcm/cm (0.28) (ft-lb/in)
Rockwell Hardness(M scale)		ASTM D785	83

<b>Thermal</b>		<b>Test Method</b>	<b>Value</b>
Heat Deflection Temperature(18.6kgf/cm <sup>2</sup> )		ASTM D648	90 °C (194) (°F)
Vicat Softening Temperature(1kg, 50°C/h)		ASTM D1525	107 °C (225) (°F)

<b>Flammability</b>		<b>Test Method</b>	<b>Value</b>
Flame Rating - UL (1.6mm)		UL 94	HB

**Notes**

These are just typical properties, not specifications. Users should confirm results by their own test.

## Technical Data Sheet

### SAN(Styrene Acrylonitrile) SAN 310TR

#### Processing guide

Injection Guide	Unit	Value
Nozzle	°C	190~220
Front	°C	190~210
Middle	°C	180~200
Rear	°C	170~190
Hopper Throat	°C	45
Mold	°C	40~70

Drying	Unit	Value
Temperature	°C	75~85
Time	hr	2~4

#### Notes

These are only mentioned as general guidelines.

## II. KUMHO SAN Products – General Properties

Application	GRADE	AN (%)	Mw (x10 <sup>4</sup> )	MI (230°C, 3.8Kgf)	MI (220°C, 10Kgf)	MI (200°C, 5.0Kgf)
Injection molding and Extrusion (Blue tint & Ice)	SAN 310CTR	20.5	15.0	20	66	6.6
	SAN 310TR	21.0	17.5	11	31	3.1
	SAN 330 I	24.5	17.0	8.3	22.7	2.3
	SAN 335T	26.0	15.5	10	25	2.5
Disposable lighter	SAN 350HW	34.0	15.5	6	15	1.5
Compounding (ABS, EP)	SAN 320A	24.5	10.4	39	110	11
	SAN 326A	26.0	12.6	21	63	6.1
	SAN 300A	28.0	12.5	21	60	6.1
	SAN 300H	28.0	18.0	3.8	9.5	1
	SAN 350A	32.0	11.4	12	30	3
	SAN 350HM	33.0	15.5	5.5	12.1	1.2

\*These are just typical properties, and do not mean specifications. Users should check by their own test.

## II. KUMHO SAN Products – Typical application

beyond  
the best

Compounding



Cosmetic case



Food Container



Home appliances



KUMHO  
SAN

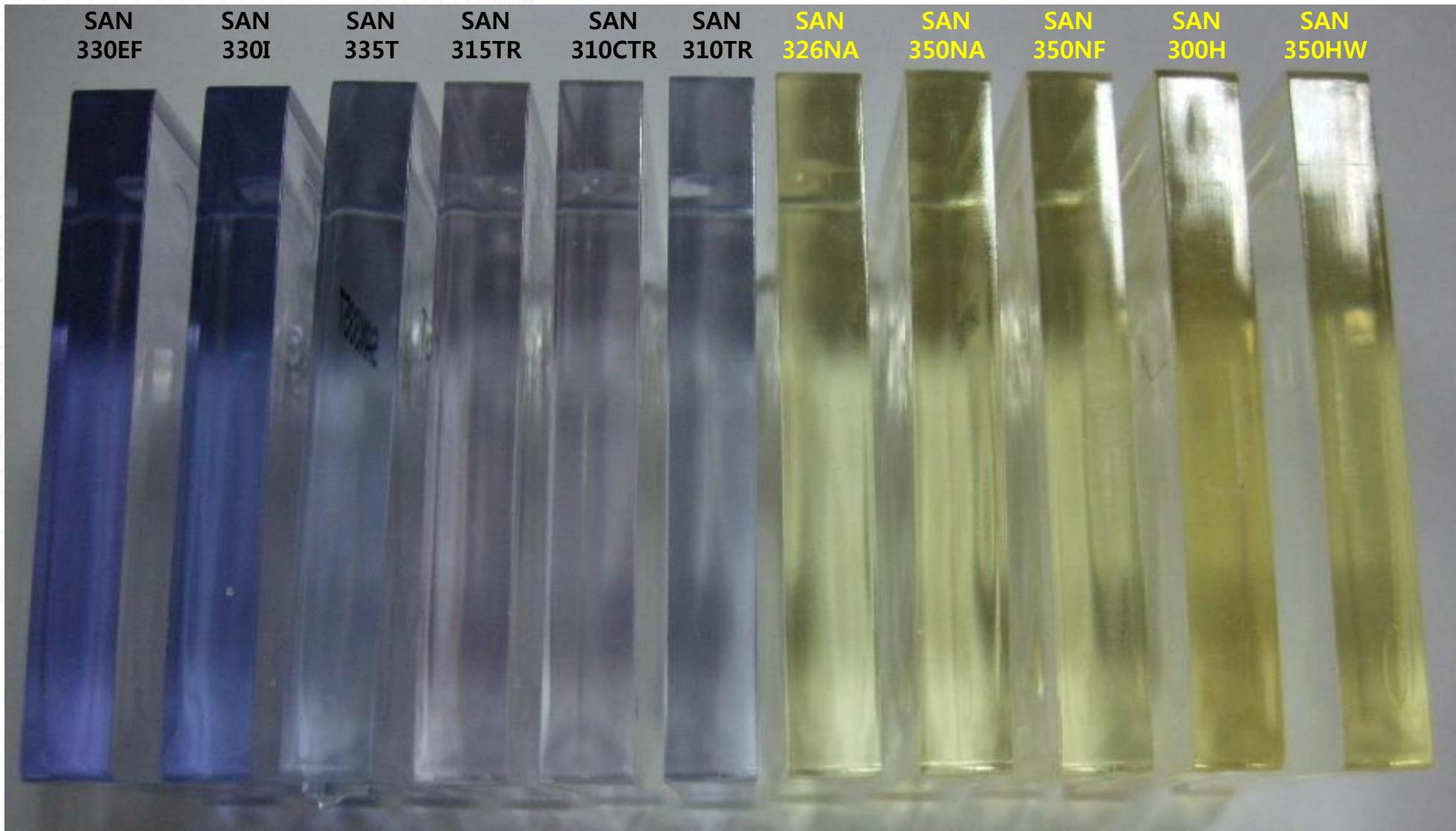
Green House



Shower Booth



## II. KUMHO SAN Products – Color Variants



### III. Food Contact Materials – SAN

#### Major Regulations

	EU	US	Korea	China	Japan
<b>Definition</b>	FCM (Food Contact Material)	FCN (Food Contact Substance)	Utensils, container and packaging	FCPM (Food container and packaging materials)	Utensils, container and packaging
<b>Regulation</b>	EU 10/2011	FDA 21 CFR	NIFDS	GB9685	JHOSPA
<b>Positive List</b>	<input type="radio"/> (Union List)	<input type="radio"/>	X	<input type="radio"/>	( <input type="radio"/> ) Self restriction
<b>Negative List</b>	X	<input type="radio"/>	X	X	( <input type="radio"/> ) Self restriction
<b>TEST</b>	SML, OML	CEDI, ADI	Migration test	SML	EDI, ADI

<Notes>

- Positive List: Authorized substances List
- Negative List: Restricted substances List
- SML: Specific Migration Limit
- OML: Overall Migration Limit
- EDI. CEDI: Cumulative Estimated Daily Intake
- ADI: Acceptable Daily Intake

EU applies a **single unified regulation** to plastic materials and articles intended to come into contact with food. Each member country of EU recognizes **the Union List on plastic raw materials, based on the regulation EU 10/2011.**

### III. Food contact material – SAN

#### SAN grades for Food Contact materials

Grade	EC 1907/2006	EC 1935/2004		EC 2023/2006	EU Directive		
	REACH Compliance	EU 10/2011	LFGB*	GMP (Good manufacturing Practice)	2011/65/EC (RoHS)	94/62/EC (Package and packaging waste)	2009/48/EC (Toy safety EN 71-3)
		AN- migration					
SAN 310CTR	●	●	●	●	●	●	●
SAN 310TR	●	▲	●	●	●	●	●
SAN 330I	●	▲	●	●	●	●	●
SAN 335T	●	▲	●	●	●	●	●
SAN 310TR E	●	●	●	●	●	●	●
SAN 330I E	●	●	●	●	●	●	●
SAN 335T E	●	●	●	●	●	●	●

\* LFGB: In compliance with LFGB Section 30, 31 except AN-migration test.

KUMHO has developed **NEW SAN E grades** for food contact materials.