

Technical Data Sheet

SAN(Styrene Acrylonitrile)

SAN 310TR

Features High transparency, High toughness

Applications Hanger, Mixer, Pitcher

Physical	Test Method	Value
Density	ASTM D792	1.07 g/cm ³
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 %

Mechanical	Test Method	Value
Tensile Strength	ASTM D638	660 kg/cm ² (9,372) (psi)
Elongation	ASTM D638	4.5 %
Flexural Strength	ASTM D790	950 kg/cm ² (13,490) (psi)
Flexural Modulus	ASTM D790	34,200 kg/cm ² (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

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

Flammability	Test Method	Value
Flame Rating - UL (1.6mm)	UL 94	HB

Notes

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

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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 ⁴)	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

Compounding



Cosmetic case



Food Container



**KUMHO
SAN**

Home appliances



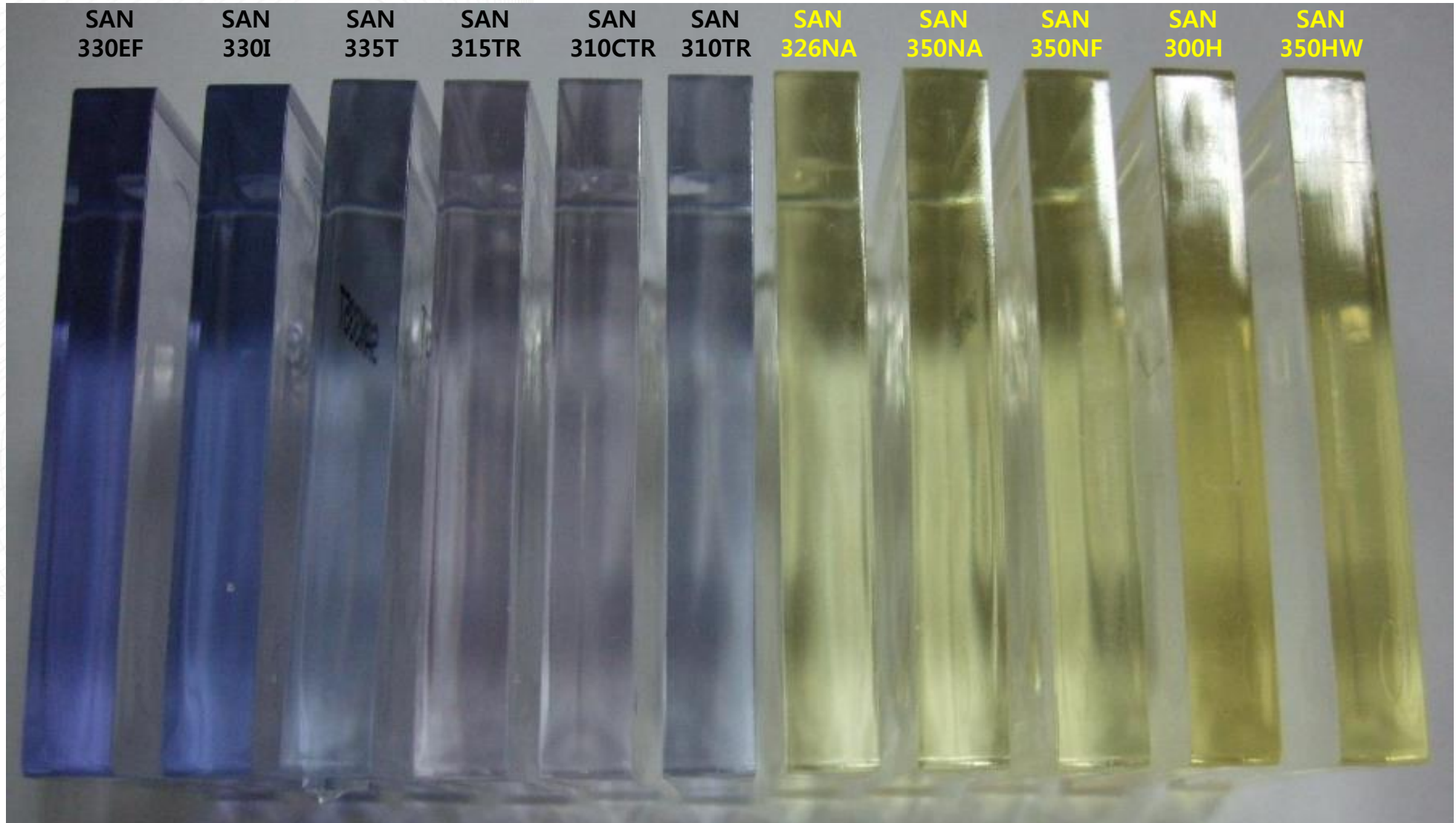
Green House



Shower Booth



II. KUMHO SAN Products – Color Variants



III. Food Contact Materials – SAN

Major Regulations

	EU	US	Korea	China	Japan
Definition	FCM (Food Contact Material)	FCN (Food Contact Substance)	Utensils, container and packaging	FCPM (Food container and packaging materials)	Utensils, container and packaging
Regulation	EU 10/2011	FDA 21 CFR	NIFDS	GB9685	JHOSPA
Positive List	○ (Union List)	○	X	○	(○) Self restriction
Negative List	X	○	X	X	(○) Self restriction
TEST	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.