SUMIKAFLEX 450HQ

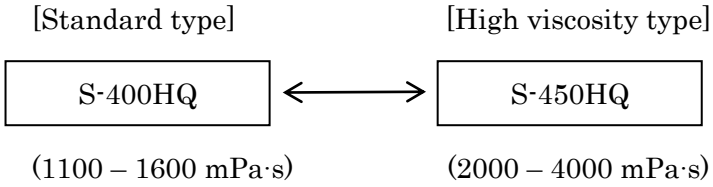
Copolymer type:	Ethylene-Vinyl acetate Copolymer Emulsion
Properties:	SUMIKAFLEX 450HQ (S-450HQ) is a high viscosity emulsion. It has miscibility with any additive. It has good adhesion. Its viscosity is easily increased by an organic solvent or thickener. It has good properties for adhesion of wood, especially for wood or decorative laminated plywood.
Main application:	Adhesives Carton Mortar

Physical properties :

Appearance		Milky white
Solid content	(%)	55 ± 1
Viscosity	(mPa·s)	2000 – 4000
pH		4 – 7
Ave. particle size	(μm)	0.7
Density	(g/cm^3)	1.07
MFT	(°C)	0
Particle charge		Nonionic
Mechanical stability		Good
Tg	(°C)	0
Tensile strength	(MPa)	13.0
Tensile elongation	(%)	540

< Technical Information of SUMIKAFLEX 450HQ >

1. Grade position



2. Emulsion properties

		Emulsion properties
Appearance		Milky white
Solid content	(%)	55 ± 1
Viscosity	(mPa·s)	2000 – 4000
pH		4 – 7
Ave. particle size	(μm)	0.7
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MFT	(°C)	0
Particle charge		Nonionic
Mechanical stability		Good
Tg	(°C)	0

3. Film properties

(1) Tensile strength

		S-450HQ	S-400HQ	S-460HQ
Dry	Elongation (%)	540	550	620
	Strength (MPa)	13.0	12.7	13.0
Wet	Elongation (%)	590	600	660
	Strength (MPa)	3.8	3.3	3.2

Test method

Thickness of film : 0.15 mm
Shape of film : Dumbbell No.3
Film forming condition and aging : 23°C × 65%RH × 7 days
Measurement speed : 500 mm/min

(2) Water or alkali liquid of resistance of film

		S-450HQ	S-400HQ	A-460HQ
Water resistance	Elusion (%)	4	5	9
	Absorption (%)	16	16	19
Alkali resistance	Elusion (%)	12	9	12
	Absorption (%)	23	20	28

Test method

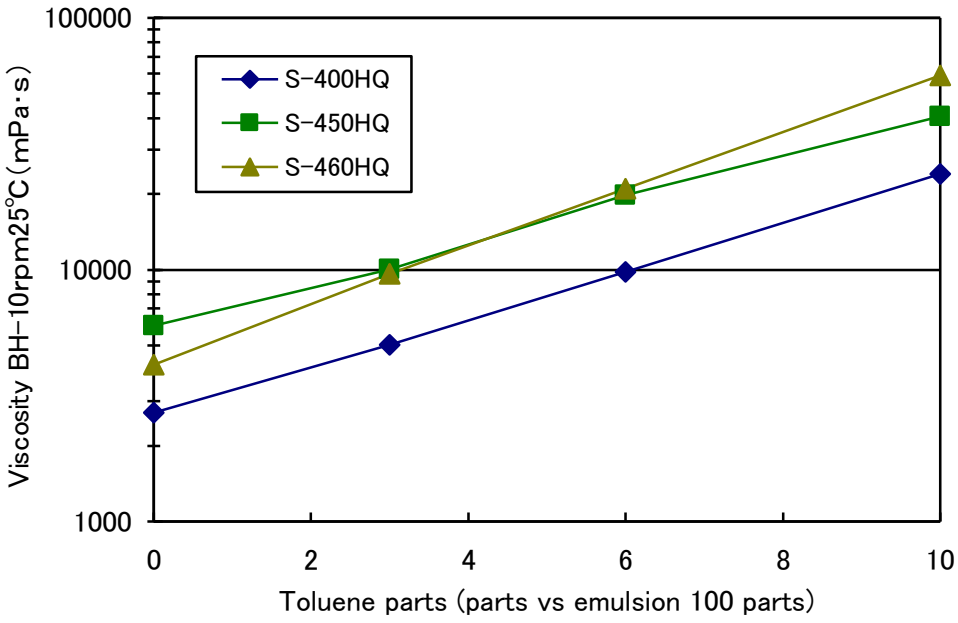
Thickness of film : 0.15 mm

Water resistance : Film in water for 4 days at 23 °C

Alkali resistance : Film in 1 N NaOH for 4 days at 23 °C

4. Modification of physical properties

(1) Toluene thickening



5. Applications

(1) Plastic sheet to plywood

	Toluene additive (parts)	Peel strength (N/25 mm)		60°C Creep (mm/hr)
		Dry	Wet	
S-450HQ	0	52	25	6
	6	50	15	40
	10	45	14	55
S-400HQ	0	53	21	5
	6	49	15	40
	10	43	13	58
S-460HQ	0	50	19	4
	6	48	16	38
	10	46	16	50

Test method

Plastic sheet: Thin Flexible PVC sheet

Plywood: Lauan JAS Type 1 3 ply 3 mm thickness

Adhesive formulation: Emulsion / Toluene = 100/0, 6, 10 parts

Spread: Wet 130 g/m^2

Pressing: 50 kg/30 × 30 cm^2, 24 hours (23°C × 65%RH)

Aging: 6 days after pressing (23°C × 65%RH)

Peeling strength (dry condition): Peel speed 100 mm/min, Peel angle 180°

Peeling strength (wet condition): Wetting test piece after test piece in water for 20 hours, peel speed and angle are the same as dry condition

60°C Creep: At 60°C, 500g weight for 90°angle of static load test

(2) Plastic sheet to particle board

	Peel strength (N/25 mm)		60°C Creep (mm/10 min)
	Dry	Wet	
S-450HQ	34	27	20
S-400HQ	35	27	18
S-460HQ	38	31	19

Test method

Particle board: JIS A5908 200-U type

Plastic sheet: Thin Flexible PVC sheet

Spread: Wet 110 g/m^2

Pressing: 50 kg/30 × 30 cm^2 for 24 hours (23°C × 65%RH)

Aging: 6 days after pressing (23°C × 65%RH)

Peel speed: 50 mm/min

60°C Creep: At 60°C, 1000 g weight for 90° angle of static load test, measure the peeled length

(3) Setting time for several materials

		S-450HQ	S-400HQ	S-460HQ
A	Craft paper/Craft paper	9 sec	12 sec	13 sec
B	Craft paper/Aluminum	23 sec	23 sec	23 sec
C	Craft paper/PVC	12 sec	18 sec	20 sec
D	Particle board/PVC	50 min	55 min	50 min
E	Gypsum/PVC	3 min	4 min	3 min

Test method

Adhesive: A – B (emulsion only), C – E (emulsion and Toluene 6 parts mixing)

Spread: A – C: Wet 50 g/m^2 D – E: Wet 110 g/m^2

Test room condition: 23°C × 65%RH

Measurement: Coat the substrate with adhesive as soon as possible, the substrate and the coated substrate will be bonded, then peel the substrate at a constant time. Measured the time when the substrate is completely broken.

(4) Gummed up property

	Gummed up time (min)
S-450HQ	61
S-400HQ	75
S-460HQ	52

Test method

Role coater Speed: 85 m/min