

Technical Data – BladeSave

V1.01/02/2017

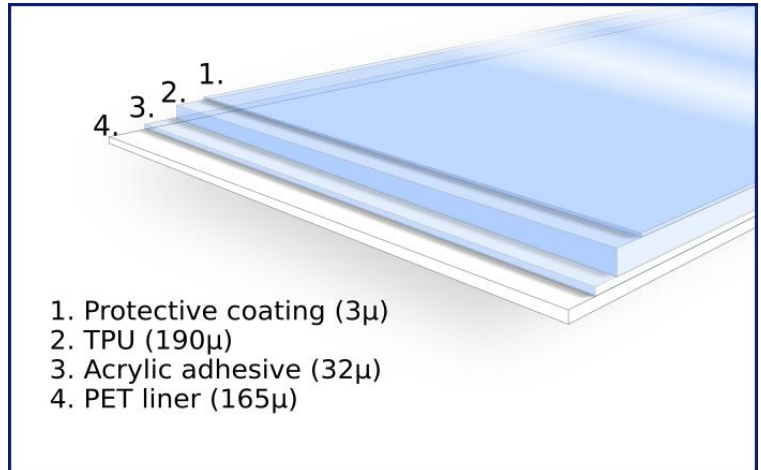
CS500LS

Product description

- High gloss thermoplastic polymer
- Non yellowing non-PVC PPF material
- High quality anti-chip protection film
- 10 years warranty
- Stain resistant
- Leaves no residue

Construction

- Protective coating (water-repellent & anti-scratch) ($3 \pm 2\mu\text{m}$)
- TPU ($190 \pm 10\mu\text{m}$)
- Acrylic adhesive ($32 \pm 3\mu\text{m}$)
- PET liner ($165 \pm 10\mu\text{m}$)



Technical data

Item	Unit		Spec.		Test method
Thickness	μm	Inch	225	.00886	ASTM D3652
Initial peel strength	N/25mm	-	> 10	-	JIS Z 0237
Final peel strength	N/25mm	-	> 16	-	JIS Z 0237
Durability	mm/24h	-	<0.3	-	JIS Z 0237
Light transmittance	degree °	-	>86	-	JIS Z 7361
60° surface gloss	%	-	>80	-	JIS Z 8741
Specific gravity	g/cm^2	-	0.94 – 0.96	-	JIS Z 6760
Tensile strength (MD)	M pa	-	> 15	-	JIS K 0732
Tensile strength (TD)	M pa	-	> 17	-	JIS K 0732
Tear strength (MD)	M pa	-	< 35	-	JIS K 0732
Tear strength (TD)	M pa	-	< 34	-	JIS K 0732
Tensile strength at break (MD)	M pa	-	≥ 17	-	JIS K 0732
Tensile strength at break (TD)	M pa	-	≥ 17	-	JIS K 0732
Electric resistance		> $10^8 \Omega$		Surface resistance	
Abrasion resistance	Dry	Pass		JIS 0849 II	
	Wet	Pass		100 times	
Light stability	No change		SWOM 225 hrs		

Note

Unless stated otherwise all values given are average. All of the tapes in our range should be thoroughly tested on the substrates in the particular application they are intended for. Hi-Bond Tapes Ltd. will not be responsible for product failure unless full testing has been completed. The customer has to decide on the tapes suitability for the intended application.

Material property tests

Drop test

Description:

4mm Toughened glass, Clear Shield protection applied
1kg chrome ball (JIS B 1501) was dropped from 25cm / 50cm / 75cm / 100cm / 125cm / 150cm

Drop distance	0.25m	0.5m	0.75m	1m	1.25m	1.5m
Impact (G)	225.42	319.26	390.66	450.84	530.88	522.84
Impact (F)	235kgf	332kgf	407kgf	469kgf	525kgf	576kgf
Glass (t) Only	✓	✓	✓	X		
1 st	✓	✓	✓	✓	✓	✓
2 nd	✓	✓	✓	✓	✓	✓
3 rd	✓	✓	✓	✓	✓	✓

Single point impact test

Description:

4mm Toughened glass, Clear Shield protection applied (9H)
5.5kg chrome ball (JIS B 1501) was dropped from 25cm / 50cm / 75cm / 100cm / 125cm / 150cm

Speed km/h	84	126	144	180	198	252
Energy J	1.5J	3.4J	4.4J	6.9J	8.3J	13.5J
Impact (F)	235kgf	332kgf	407kgf	469kgf	525kgf	576kgf
Glass (t) Only	✓	X				
9H Glass PET	✓	✓	△	X		
1 st	✓	✓	✓	✓	X	
2 nd	✓	✓	✓	✓	X	
3 rd	✓	✓	✓	X		
4 th	✓	✓	✓	✓	X	

Reflection test

Film contamination test:

1. 10%, 5%, 0.5% acid applied in 10mm radius
2. Applied for 24 hours, after 48h wiped and removed

RESULT: No change

Stain resistance test:

1. Test sample was applied to a Diesel truck's muffler. The truck drove 400km (2 days)
2. Cleaned with paper

Colour results after wipe					
Sample		L	A	b	ΔE
2009T FM	Sample 1 Upper	-32.41	1.78	7.61	32.34
	Sample 1 Middle	-18.81	0.48	10.20	21.4
	Sample 2 Overall	-35.53	1.91	9.02	36.71

L: Whiteness
 A: - Yellow, + Red
 B: - Blue, +Yellow
 ΔE: Colour change

Salt water test:

1. JIS K 560-4-7 test method piece was applied for 48 hours
2. JIS K 5600-7-1 test method piece was applied for 240 hours then tested within 1 hour

Test results:

Visual: Maintained
 Grey scale: None
 Gloss meter: Within 91%
 Contamination class: 5

*Note: 1000mg of salt water used for test contains 35g of salt and 965g of water

Room temperature friction test:

1. Material was applied to a PC board then installed to bumper
2. Results were recorded after 6 months of road test after wiping

Test results:

No changes found on Clear Shield protector

Super UV test:

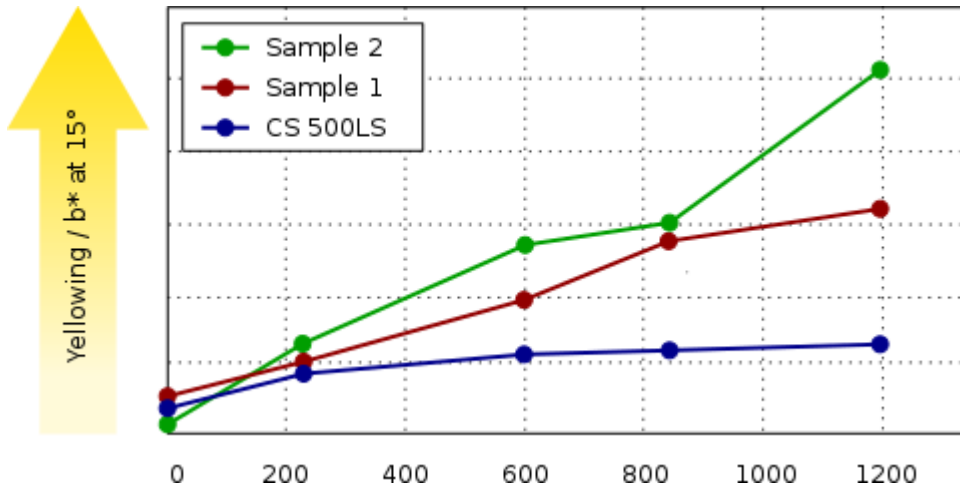
Light source: Metal halide lamp
 Radius: 295~400nm
 Heat ray strength: 1000W/m²
 Black panel temp.: 50°C ± 3°C
 Humidity: UV On 40% RH, UV Off 90% RH
 Duration: UV On 6h, UV Off 2h
 Probe: A= PET (100μ) + Top coating, B= PET (100μ)*



M-WOM Accel test:

Light source: Metal halide lamp
 Radius: 295~430nm
 Heat: 90W/cm²
 Black panel temp.: 50°C ± 3°C
 Cycle: UV on – Blackout – On/Off
 Material: PPF

* Equivalent to 10years of testing



Application

Clear Shield BladeSave protection films have been specially developed for protecting susceptible areas of turbines blades from damage from stone chips and scuffing. The films are produced from high grade polyurethane, which has excellent high impact resistance, excellent transparency and high gloss. The films are coated with quality acrylic adhesive with very good long term ageing properties. Tested in most extreme climatic conditions in Russia and United Arab Emirates, the films will not crack, discolour or shrink.