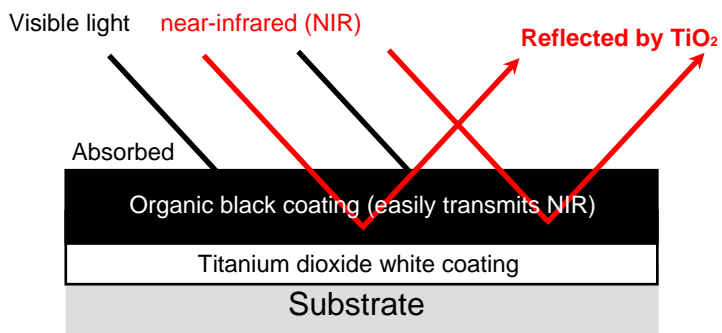
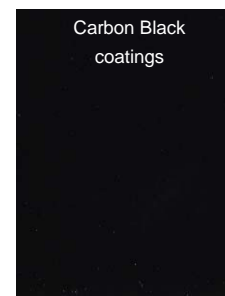


Heat blocking effect of TITANIX JR-1000 in two-coat film

● NIR reflectance model with double-layer coating



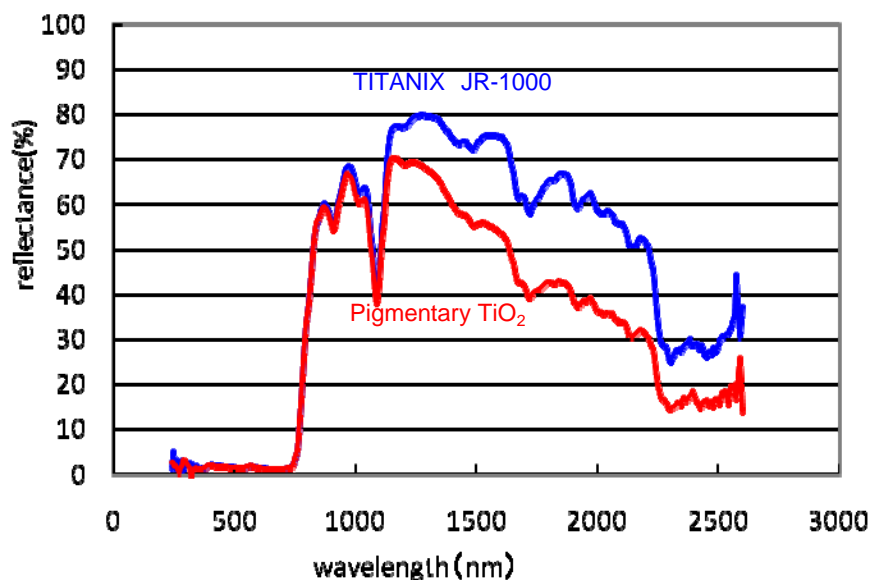
● Black film color sample



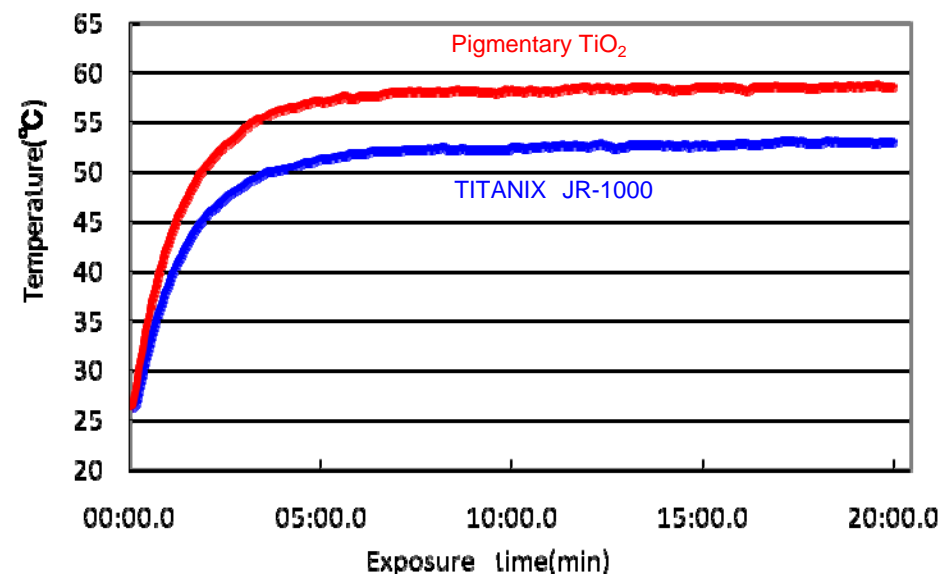
Top coatings	Under coatings	Hunter color value			Solar reflectance (%)		
		L	a	b	300 - 780 nm	780 - 2500 nm	300 - 2500 nm
Organic black	TITANIX JR-1000	8.7	-0.4	0	1.6	66.3	30.4
↑	Pigmentary TiO ₂	8.7	-0.4	0	1.5	52.5	26.1
Carbon black	Pigmentary TiO ₂	5.4	-0.4	-0.2	0.9	1.0	1.0

● Difference in TiO₂ (2 coats)

-reflectance curves, film color, & solar reflectance

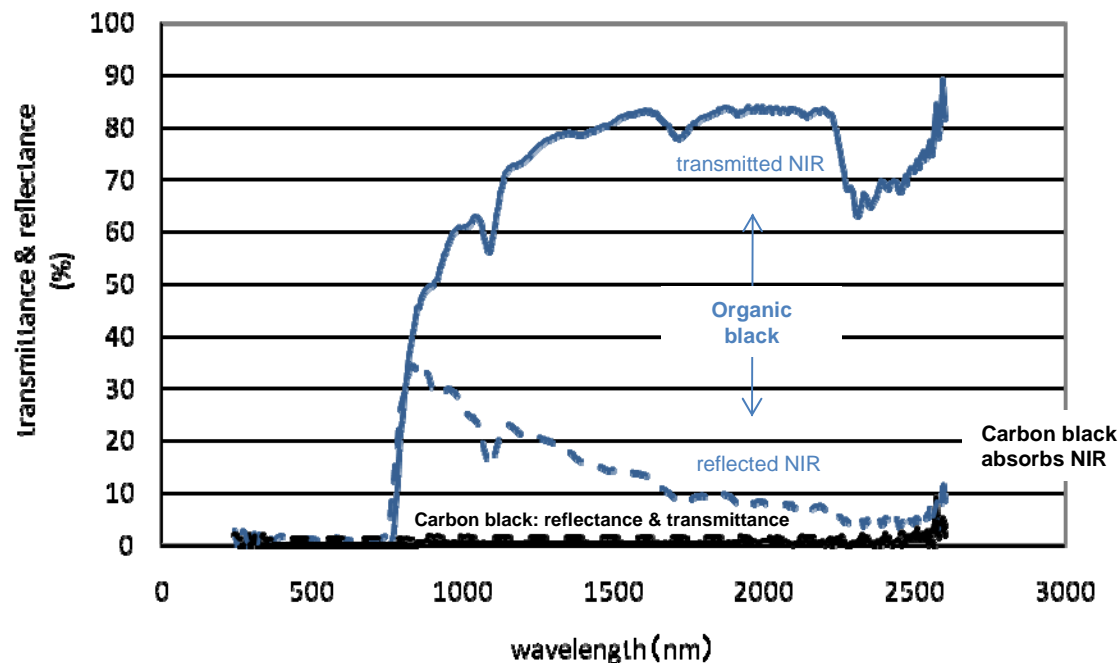


● Heat blocking test (2 coats)



Heat blocking effect of TITANIX JR-1000 in two-coat film

- Organic black can transmit NIR
-reflectance curves & solar reflectance



Top coatings	Solar transmittance (%)			Solar reflectance (%)		
	380 - 780 nm	780 - 2500 nm	300 - 2500 nm	380 - 780 nm	780 - 2500 nm	300 - 2500 nm
Organic black	1.3	16.8	11.6	0	73.6	30.1
Carbon black	1.3	1.5	1.4	0	0.4	0.2

- Two-coat formulation & coating conditions

- 1) Paint formulation
 - a) Top coat (Pigment concentration, 10 PHR)

Dispersion	Content (g)
Organic or carbon Black pigment *1	50
Beckosol J-524 (solid content, 60%) *2	12
Xylene/Butyl alcohol = 8/2	12
Silicone for leveling	1

Letdown	Content (g)
Beckosol J-524 (solid content, 60%) *2	46.3
Super Beckamine J-820 (solid content, 60%) *2	25

- b) Under coat (Pigment concentration, 100 PHR)

Dispersion	Content (g)
Titanium dioxide	50
Beckosol J-524 (solid content, 60%) *2	12
Xylene/Butyl alcohol = 8/2	12
Silicone for leveling	1

Letdown	Content (g)
Beckosol J-524 (solid content, 60%) *2	46.3
Super Beckamine J-820 (solid content, 60%) *2	25

*1 Organic black prepared using the following:

Red pigment : AZO red pigment 8040

(Dainichiseika color & chemicals Mfg.)

Blue pigment : Copper phthalocyanine blue pigment FastogenBlue TGR

(DIC)

*2 from DIC

2) Coating conditions

Coating method	Bar coater
Substrate	Tin free steel(20 x 20 cm)
Film thickness	40 μm