

# Technical Information



Nippon Kayaku (Thailand) CO., LTD.  
Technical Service Center

(vol. 15)

## [Additional light fastness results of KP 5L-SF 200 and KM 6L-SF]

Please see the following documents for reference:

- 1) [Introduction of KP 5L-SF 200 and KM 6L-SF series](#)
- 2) [KP 5L-SF 200 and KM 6L-SF technical information](#)

In addition to the above documents, we have conducted additional light fastness tests in comparison on different materials, which will be the focus of this document.

Additional fabric materials wherein light fastness tests were conducted:

- (A) Front 1d Brushed Polyester /Back 3d Polyester
- (B) Polyester blackout curtain material  
(Material in which carbon yarn is woven in the middle of the front and back)
- (C) Ultra-fine polyester fiber

NIPPON KAYAKU (THAILAND) CO., LTD.

ADD: 13<sup>th</sup> Floor, Ramaland Building, 952 Rama IV road, Suriyawongse, Bangrak, Bangkok 10500  
TEL: +66-2-235-2843 HP: <http://www.kayakuth.co.th>

(A) Front 1d Brushed Polyester /Back 3d Polyester

Light Fastness Test: JIS Carbon-arc		Material: Polyester (front 1d/back 3d)						Judge Blue: Blue Scale Black: Grey Scale			
%o.w.f.	表(front)	裏(back)	Grade 4		Grade 5		Grade 6				
			4 ↑	4-5	5 ↑	4-5	5-6	4-5			
KP Yellow 5L-SF 200	0.107										
KP Red 5L-SF 200	0.052										
KP Blue 5L-SF 200	0.170										
KM Yellow 6L-SF	0.145			4 ↑	4-5		5 ↑	4-5		6 ↑	4-5
KM Red 6L-SF	0.104										
KM Blue 6L-SF	0.246										
KP Yellow Brown 3RL(EC) 143	0.145			4	4-5		3-4			2-3	
KYC Red E-GL	0.060										
KYC Blue E-TB	0.228										
Disperse Orange KS	0.190			4	4-5		3-4			2-3	
KM Red C-LS(EC) conc	0.054										
KP Blue AN-SE	0.148										
KM Yellow AQ-LE	0.245			4	4		3-4			2-3	
KM Red AQ-LE	0.337										
KM Blue AQ-LE	0.388										
Disperse Orange 30	0.116			4 ↓	3-4		3			1-2	
Disperse Red 167.1	0.032										
Disperse Blue 79.1	0.149										
Other company SE type trichromatic colors <b>A</b>	0.171			4 ↑	4-5		4-5	4		2-3	
	0.094										
	0.335										
Other company SE type trichromatic colors <b>B</b>	0.105			4	4-5		4			2-3	
	0.202										
	0.401										

(B) Polyester blackout curtain material (carbon-doped yarn is woven between the front and back)

Light Fastness Test: JIS Carbon-arc		Material: Polyester Blackout curtain						Judge Blue: Blue Scale Black: Grey Scale			
%o.w.f.	表(front)	裏(back)	Grade 4		Grade 5		Grade 6				
			4 ↑	4-5	5 ↑	4-5	5-6	4			
KP Yellow 5L-SF 200	0.107										
KP Red 5L-SF 200	0.052										
KP Blue 5L-SF 200	0.170										
KM Yellow 6L-SF	0.145			4 ↑	4-5		5 ↑	4-5		6 ↑	4-5
KM Red 6L-SF	0.104										
KM Blue 6L-SF	0.246										
KP Yellow Brown 3RL(EC) 143	0.145			4	4		2-3			2	
KYC Red E-GL	0.060										
KYC Blue E-TB	0.228										
Disperse Orange KS	0.190			4	4		2-3			2	
KM Red C-LS(EC) conc	0.054										
KP Blue AN-SE	0.148										
KM Yellow AQ-LE	0.245			4	4		3			2	
KM Red AQ-LE	0.337										
KM Blue AQ-LE	0.388										
Disperse Orange 30	0.116			4 ↓	3		2			1-2	
Disperse Red 167.1	0.032										
Disperse Blue 79.1	0.149										
Other company SE type trichromatic colors <b>A</b>	0.171			4	4		2-3			2	
	0.094										
	0.335										
Other company SE type trichromatic colors <b>B</b>	0.105			4	3-4		2-3			2	
	0.202										
	0.401										

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(c) Ultrafine fiber Polyester

Light Fastness Test: JIS Carbon-arc			Judge Blue: Blue Scale Black: Grey Scale			
Material: Polyester Ultrafine fiber						
%o.w.f.	表(front)	裏(back)	Grade 4		Grade 5	Grade 6
			4	4	3-4	2-3
KP Yellow 5L-SF 200	0.107					
KP Red 5L-SF 200	0.052					
KP Blue 5L-SF 200	0.170					
KM Yellow 6L-SF	0.145		4	4-5	4-5	4
KM Red 6L-SF	0.104					
KM Blue 6L-SF	0.246					
KP Yellow Brown 3RL(EC) 143	0.145		4	2-3	1-2	1-2
KYC Red E-GL	0.060					
KYC Blue E-TB	0.228					
Disperse Orange KS	0.190		4	3-4	2	1-2
KM Red C-LS(EC) conc	0.054					
KP Blue AN-SE	0.148					
KM Yellow AQ-LE	0.245		4	3-4	1-2	1-2
KM Red AQ-LE	0.337					
KM Blue AQ-LE	0.388					
Disperse Orange 30	0.116		4	2	1	1
Disperse Red 167.1	0.032					
Disperse Blue 79.1	0.149					
Other company SE type trichromatic colors <b>A</b>	0.171		4	3	2	1-2
	0.094					
	0.335					
Other company SE type trichromatic colors <b>B</b>	0.105		4	3	2	1-2
	0.202					
	0.401					

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Summary of light fastness results shown above

**Carbon-arc (JIS)**

Trichromatic	%owf	Front 1d Brushed Polyester Back 3d Polyester			PET Blackout curtain			Ultrafine PET		
		Grade 4	Grade 5	Grade 6	Grade 4	Grade 5	Grade 6	Grade 4	Grade 5	Grade 6
KP Yellow 5L-SF 200	0.107	4↑	5↑	5-6	4↑	5↑	5-6	4		
KP Red 5L-SF 200	0.052	4-5	4-5	4-5	4-5	4-5	4	4	3-4	2-3
KP Blue 6L-SF 200	0.170									
KM Yellow 6L-SF	0.145	4↑	5↑	6↑	4↑	5↑	6↑	4↑	4-5	
KM Red 6L-SF	0.104	4-5	4-5	4-5	4-5	4-5	4-5	4-5	4	3-4
KM Blue 6L-SF	0.246									
KP Yellow Brown 3RL(EC) 143	0.145	4			4			4↓		
KYC Red E-GL	0.060	4-5	3-4	2-3	4	2-3	2	2-3	1-2	1-2
KYC Blue E-TB	0.228									
Disperse Orange	0.190	4			4			4↓		
KM Red C-LS(EC) conc	0.054	4-5	3-4	2-3	4	2-3	2	3-4	2	1-2
KP Blue AN-SE	0.148									
KM Yellow AQ-LE	0.245	4			4			4↓		
KM Red AQ-LE	0.337	4	3-4	2-3	4	3	2	3-4	1-2	1-2
KM Blue AQ-LE	0.388									
C.I. Disperse Orange 30	0.116	4↓			4↓			4↓		
C.I. Disperse Red 167.1	0.032	3-4	3	1-2	3	2	1-2	2	1	1
C.I. Disperse Blue 79.1	0.149									
<b>Other company SE type trichromatic colors A</b>	0.171	4↑	4-5		4			4↓		
	0.094	4-5	4	2-3	4	2-3	2	3	2	1-2
	0.335									
<b>Other company SE type trichromatic colors B</b>	0.105	4			4			4↓		
	0.202	4-5	4	2-3	3-4	2-3	2	3	2	1-2
	0.401									

Judgement: **Upper (Blue): Blue scale** **Lower (Black): Grey scale**

- In the results of the light fastness tests, the numbers in blue represent the results by blue scale, while the numbers in black represent the results by grey scale. In the case of blue scale judgement, if the judgement by blue scale is concluded as 4↓ at Grade 4, the Grade 5 irradiation is not further conducted and will be judged as 4↓.
- When conducting Grade 4, Grade 5, and Grade 6 irradiation continuously, grey scale fading judgement may provide more clarity in interpreting the results.
- In fact, overseas, there is an increasing number of apparel standards that requires ISO or AATCC irradiation of X hours and a gray scale of 3-4 grade or higher for fading. The price of blue scale is high, and the dyes used for blue scale are different from JIS, ISO, and AATCC standards, so even if each blue scale is irradiated at the same time, the result will be different depending on the standards. Also, as you may have experienced, if the inspection agency implements light fastness, the blue scale that is simultaneously irradiated will not be returned unless requested. Thus, the result may not be verifiable.
- In terms of dyes, KP 5L-SF 200 and KM 6L-SF are recommended when there are requirements for high light fastness (5<sup>th</sup> Grade or higher). For some micro-polyester materials with poor light fastness, the light fastness may be improved by using an ultraviolet absorber. However, if the fastness is still not sufficient to pass the standard, we would like to recommend testing our KP 5L-SF 200 and KM 6L-SF as a solution.
- As a side note, sales of KM 6L-SF has been increasing recently as the number of materials or standards that require light fastness has been expanding overseas.

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