

High-visibility clothing - Test methods and requirements (EN ISO 20471:2013+A1:2016)

Conclusion	A	Remark
Clause 5.1 Colour Performance Requirements of New Material	PASS	
Clause 5.1 Colour Performance Requirements of Material after Domestic Washing	PASS	
Clause 5.2 Colour Performance Requirements of Materials after Xenon Test	PASS	
Clause 5.3.1 Colour Fastness To Rubbing	PASS	
Clause 5.3.2 Colour Fastness To Perspiration	PASS	
Clause 5.3.3 Colour Fastness To Washing	PASS	
Clause 5.3.3 Colour Fastness to Hot Pressing	PASS	
Clause 5.4 Dimensional Change after Domestic Washing	PASS	
Clause 5.5.1 Tensile Strength	PASS	

Remark(s) : PASS=Meet General Requirement



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Test Result

High-visibility clothing - Test methods and requirements

EN ISO 20471:2013+A1:2016

Clause 5.1 Colour Performance Requirements of New Material

(EN ISO 20471:2013+A1:2016, Clause 7.2)

	Unit	A
Chromaticity coordinates, x value	-	0.370
Chromaticity coordinates, y value	-	0.536
Luminance Factor, β	-	0.98

Conclusion: Pass

Remark:

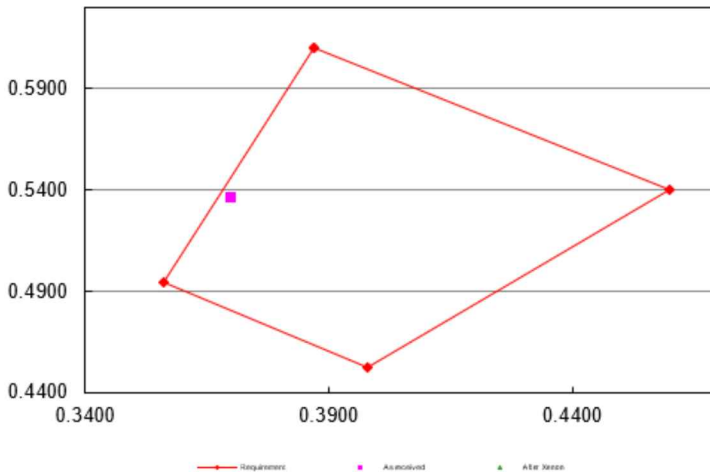
The chromaticity coordinates and the luminance factor shall comply with the requirement as below. The chromaticity shall be within one of the areas and the luminance factor shall comply with the corresponding minimum value.

Fluorescent yellow:

Chromaticity coordinates x/y: 0.387/0.610, 0.356/0.494, 0.398/0.452, 0.460/0.540.

Minimum luminance factor β_{min} : 0.70

Graphs:



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Clause 5.1 Colour Performance Requirements of Material after Domestic Washing

(EN ISO 20471:2013+A1:2016, Clause 7.2)

After 5 Washes

	Unit	A
Chromaticity coordinates, x value	-	0.369
Chromaticity coordinates, y value	-	0.535
Luminance Factor, β	-	0.99

Conclusion: Pass

Remark:

1. Pre-treatment(cleaning procedure): ISO 6330:2021:Using horizontal axis, front-loading type machine; Procedure No.3N, Machine Wash At 30°C; with 2kg total dry mass (Type III (100% Polyester) Ballast+Specimen) and 20±1 g ECE reference detergent 98 without optical brightener, Line Dry

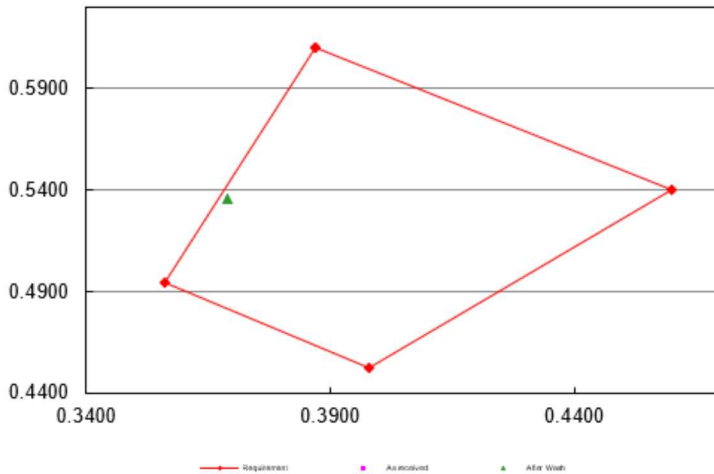
2. The chromaticity coordinates and the luminance factor shall comply with the requirement as below. The chromaticity shall be within one of the areas and the luminance factor shall comply with the corresponding minimum value.

Fluorescent yellow:

Chromaticity coordinates x/y: 0.387/0.610, 0.356/0.494, 0.398/0.452, 0.460/0.540.

Minimum luminance factor β_{min} : 0.70

Graphs:



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Clause 5.2 Colour Performance Requirements of Materials after Xenon Test

(EN ISO 20471:2013+A1:2016, Clause 7.2)

-	Unit	A
Chromaticity coordinates, x value	-	0.368
Chromaticity coordinates, y value	-	0.531
Luminance Factor, β	-	0.97

Conclusion: Pass

Remark:

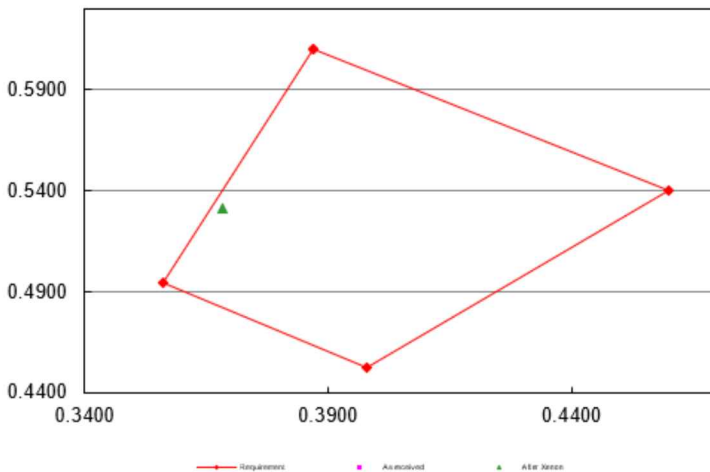
1. The chromaticity coordinates and the luminance factor shall comply with the requirement as below. The chromaticity shall be within one of the areas and the luminance factor shall comply with the corresponding minimum value.

Fluorescent yellow:

Chromaticity coordinates x/y: 0.387/0.610, 0.356/0.494, 0.398/0.452, 0.460/0.540.

Minimum luminance factor β_{min} : 0.70

Graphs:



Clause 5.3.1 Colour Fastness To Rubbing

(ISO 105-X12:2016; Size of rubbing finger: 16mm dia.)

As Received

-	Unit	A	Requirement
Dry Staining	Grade	4-5	Min.4

Remark: Grey Scale Rating is based on the 5-step scale of 1 to 5, where 1 is worst and 5 is best.



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Clause 5.3.2 Colour Fastness To Perspiration

(ISO 105-E04:2013; Test specimen in vertical position)

Acid

-	Unit	A	Requirement
Change in Shade	Grade	4-5	Min.4
Staining On Multi-fibre Stripe			Min.4
Acetate	Grade	4-5	
Cotton	Grade	4-5	
Polyamide	Grade	4-5	
Polyester	Grade	4-5*	
Acrylic	Grade	4-5	
Wool	Grade	4-5	

Alkaline

-	Unit	A	Requirement
Change in Shade	Grade	4-5	Min.4
Staining On Multi-fibre Stripe			Min.4
Acetate	Grade	4-5	
Cotton	Grade	4-5	
Polyamide	Grade	4-5	
Polyester	Grade	4-5*	
Acrylic	Grade	4-5	
Wool	Grade	4-5	

Grey Scale Rating is based on the 5-step scale of 1 to 5, where 1 is bad and 5 is good.

*Select only the fibre corresponding to the fibres of the background and non-fluorescent material.

Clause 5.3.3 Colour Fastness To Washing

(ISO 105-C06:2010; Test No.: A2S, Machine wash at 30°C with 4g/L ECE (B) and 1g/L Sodium Perborate with 10 Steel Balls)

-	Unit	A	Requirement
Change in Shade	Grade	4-5	Min.4-5
Staining On Multi-fibre Stripe			Min.4
Acetate	Grade	4-5	
Cotton	Grade	4-5	
Polyamide	Grade	4-5	
Polyester	Grade	4-5*	
Acrylic	Grade	4-5	
Wool	Grade	4-5	

Grey Scale Rating is based on the 5-step scale of 1 to 5, where 1 is bad and 5 is good.

*Select only the fibre corresponding to the fibres of the background and non-fluorescent material.



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Clause 5.3.3 Colour Fastness to Hot Pressing

(ISO 105-X11:1994; Press with Scorch Tester at 110°C for 15 seconds, single fibre: Cotton.)

A	Unit	Immediately observation	Observation after Conditioning	Requirement
Dry pressing				-
Change in Shade	Grade	4-5	4-5	Min.4-5
Staining on single fibre	Grade	4-5	4-5	Min.4

Remarks: Grey Scale Rating is based on the 5-step scale of 1 to 5, where 1 is bad and 5 is good.

Clause 5.4 Dimensional Change after Domestic Washing

(ISO 3759:2011/ISO 5077:2007/ISO 6330:2021; Using horizontal axis, front-loading type machine; Procedure No.3N, Machine Wash At 30°C; with 2.0±0.2kg total dry mass (Type III (100% Polyester) Ballast+ Specimen) and 20±1 g ECE reference detergent 98 without optical brightener, Line Dry)

After 5 Washes

	Unit	A	Requirement
-			
Lengthwise	%	-0.7	+/-3%
Widthwise	%	-0.5	+/-3%

Remark: (+)Means Growth; (-)Means Shrinkage

Clause 5.5.1 Tensile Strength

(ISO 13934-1:2013; Strip method)

As Received

	Unit	A	Requirement
-			
Warp/Length	N	1300	Min.100N
Weft/Width	N	1000	Min.100N



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Sample Photo



The statement of conformity in this test report is only based on measured values by the laboratory and does not take their uncertainties into consideration.

End of Report



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