

EU TYPE EXAMINATION CERTIFICATE



NOTIFIED BODY 2575

The PPE detailed herein meets the criteria of an EU Type Examination in accordance with Annex V, including the applicable clauses of the Essential Health and Safety Requirements of the PPE Regulation EU 2016/425, for the category II followed by conformity to type based on internal production control (module C) set out in Annex VI.

Following an EU Declaration of Product Conformity you are hereby licensed to mark the product(s) detailed in accordance with Article 17 of the PPE Regulation EU 2016/425.

VALIDITY OF CERTIFICATE

This certificate will cease its validity at any time if needed, in particular if changes in the manufacturing process, in the raw materials or in PPE components will occur.

INTERTEK ITALIA SpA
Via Miglioli, 2/A
Cernusco sul Naviglio (MI), Italy
T: +39 02 95383833
F: +39 02 95383832



PRD N° 277B

Membro degli Accordi di Mutuo Riconoscimento EA, IAF e ILAC

Signatory of EA, IAF and ILAC Mutual Recognition Agreements

Manufacturer: Mid Ocean Brands B.V.

Address: Po Box 644, 6710 BP, Ede, The Netherlands

Authorised Representative: -

Address: -

Certificate No.: ITASLNB23016244

Category Product: II

Model/Product Reference: KC8282-08, KC8282-14

Article: Yellow, Silver

Product type: High Visibility Clothing

Reference(s) Standard: EN 17353:2020

Description:

Reflective arm straps for upper limbs foldable with square pattern and black velvet backing; One strap for left and right arms to be worn to ensure 360° visibility. Type B2 for dark conditions; Sizes: L and XL,

This has been shown through satisfactory testing to: EN 17353:2020

KC8282-08 Yellow, KC8282-14 Silver -reflective arm straps

Examination of the Technical File Documentation, No: foldable with square pattern and black velvet backing - Rev.1
04/07/2023

Test Report no. See Technica File

Remark:

Note:

Issue Date 06/09/2023

Expiry Date 05/09/2028

Issued at: Lastra a Signa (FI)

General Manager Elena Ruffino

For and on behalf of INTERTEK ITALIA Spa



This Certificate is for the exclusive use of Intertek's client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the Client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.

Intertek Italia S.p.A. Via Miglioli, 2/A - 20063 Cernusco sul Naviglio, Milano - Italy

UKCA TYPE EXAMINATION CERTIFICATE

intertek
Total Quality. Assured.

**UK
CA**

APPROVED BODY AB0362

The PPE detailed herein meets the criteria of a UKCA Type Examination in accordance with PPE regulation 2016/425 on personal protective equipment, as amended to apply in GB Essential Health and Safety Requirements (Annex II of EU Regulation 2016/425) for category II products.

This has been shown through satisfactory testing to EN 17353:2020 and examination of the Technical File Documentation.

ITS Testing Services (UK) Ltd.
Centre Court
Meridian Business Park
Leicester, LE19 1WD
United Kingdom
Phone: +44 (0)116 263 0330

Manufacturer

: MID OCEAN BRANDS B.V.

PO BOX 644, 6710 BP (NL)

Issue Date

: 24 August 2023

Expiry Date

: 24 August 2028

Certificate No.

: LECFI00388569

Product Reference(s)

: KC8282-08 Yellow reflective arm straps foldable with square pattern and black velvet backing
KC8282-14 Silver reflective arm straps foldable with square pattern and black velvet backing

Description

: Type B2 for dark conditions
In accordance with EN 17353:2020 with areas of or retroreflective material. Type B2 for dark conditions. One strap per arm will ensure 360° visibility.
Size: L and XL



KC8282-08



KC8282-14



5320

Assessor: *[Signature]* Date: 24/08/2023

Certification Manager: *[Signature]* Date: 24/08/2023

For and on behalf of ITS Testing Services (UK) Limited

intertek.com Registered in England No. 1408264 Registered Office: Academy Place, 1-9 Brook Street, Brentwood, Essex CM14 5NQ

This certificate is for the exclusive use of Intertek's Client and is provided pursuant to the Certification agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this Certificate. Only the client is authorized to permit copying or distribution of this Certificate and then only in its entirety. Use of Intertek's Certification mark is restricted to the conditions laid out in the agreement and in this Certificate. Any further use of the Intertek name for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek.



Total Quality. Assured.
TEST REPORT



中国认可
国际互认
检测
TESTING
CNAS L0220

Number: GZHT91331794

Date: Apr 30, 2025

Applicant: MID OCEAN BRANDS B.V.
7/F, KINGS TOWER, 111 KING LAM STREET,
CHEUNG SHA WAN, KOWLOON, HONG KONG
Attn: DEREK HUI

Sample Description:

Fifteen (15) pieces of submitted samples said to be Yellow reflective arm straps foldable with black velvet backing.

Standard : EN 17353:2020
ISO 13688:2013/Amd.1:2021
Styles No./Name : KC8282-08
Colour : Yellow
Manufacturer : 116209
Country Of Original : CHINA
Goods Exported to : Europe
Date of Sample Received : Apr. 23, 2025
Testing Period : Apr. 23, 2025– Apr. 30, 2025
Date Final Information Confirmed/ : --/--
Date Payment Received:

Test Result Please Refer To Attached Page(S).

Should you have any query on this report, you may contact at gzfootwear@intertek.com

Authorized By:
For Intertek Testing Services Shenzhen Ltd.
Guangzhou Branch

Guiliang Dong
Senior Lab Manager

Authorized By:
For Intertek Testing Services Shenzhen Ltd.
Guangzhou Branch

Rachel Lin
Technical Specialist



Page 1 Of 16

CM / stellaxue

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
深圳天祥质量技术服务有限公司广州分公司
Room 401/501/601/801/901/1003, No. 8, East BaoYing Road, Huangpu District, Guangzhou 510730
广州市黄埔区保盈东路8号401房、501房、601房、801房、901房、1003房
Tel: +86 20 2820 9114 Postcode: 510730

www.intertek.com

检验检测专用章

SHENZHEN BRANCH

(6)

1 Types And Minimum Area Requirements (EN 17353:2020, 4)

4.1 Types

Size	-			
Requirements		Yes	No	N/A
The Enhanced Visibility Equipment Is Grouped Into Three Types Based On The Foreseeable Conditions Of Use:				
- Type A Equipment Worn By Users Where The Risk Of Not Being Seen Exists Only At Daylight Conditions. This Equipment Uses Only The Fluorescent Material As Enhanced Visibility Component.				✓
- Type B Equipment Worn By Users Where Risk Of Not Being Seen Exists Only At Dark Conditions. This Equipment Uses Only The Retroreflective Material As Enhanced Visibility Component.	✓			
Type B Is Subdivided In 3 Levels, As Below. The Classification Depends On The Total Area Worn Or On Placement Of The Device On User's Torso And Limbs:				
- Type B1 Includes Free Hanging Retroreflective Devices Only; These Devices Are Designed For Movement Recognition.				✓
- Type B2 Includes Retroreflective Devices Or Retroreflective Material Either Temporarily Or Permanently Placed On Limbs Only; These Products Are Designed For Movement Recognition. As A Minimum, The Retroreflective Material Shall Be Positioned On The Limbs As A Separate Removable Device Or Shall Be Incorporated Into Clothing Design On A Permanent Basis As A Retroreflective Element.	✓			
- Type B3 Includes Retroreflective Material Placed On Torso Or Torso And Limbs. These Products Are Designed For Form Recognition, Or Form And Movement Recognition. Type B3 Items Shall Not Be A Combination Of Permanently Attached Reflective Material And Removable Reflective Devices.				✓
- Type AB Equipment Worn By Users Where Risk Of Not Being Seen Exists During Daylight, Twilight And Dark Conditions. This Equipment Uses The Fluorescent As Well As The Retroreflective And/or Combined Performance Materials As Enhanced Visibility Components.				✓
For Each Type, The Relevant Material Requirements In Clause 6 Shall Be Fulfilled In Accordance To Clause 7.	✓			



Total Quality. Assured.

TEST REPORT

Tests Conducted (As Requested By The Applicant)



中国认可
国际互认
检测
TESTING
CNAS L0220

Number: GZHT91331794

(Cont)

4.2 Minimum Area Requirements

areas of material for Types B1 and B2			
Type	Retroreflective Materials	Requirement	Pass/Fail
B2	0.0192 m ²	0.018 m ² (*1)	Pass

Remark:

*1= If Devices, The Total Area Of Two Devices, Measured Flat.

NOTE The Area Of Visibility Material Shown In Table 3 Cannot Be Reduced Below The Minimum Requirements By The Application Of Logos, Lettering, Labels, Etc.

2 Design Requirements (EN 17353:2020, 5)

Size	-				
Requirements		Test Data	Yes	No	N/A
5.1 Size Designation					
The Size Designation For Garments Shall Be In Accordance With The Requirements Of EN ISO 13688:2013.		-			✓
5.2 Type A					
5.2.1 General					
Type A Garments (Including Partial Body Protective Clothing) Shall In Their Design Use At Least The Minimum Amount Of Fluorescent Material According To Table 3.		-			✓
5.2.2 Visibility From All Sides					
Type A Garments Shall Be Made Up Of Fluorescent Material On All Sides To Ensure 360° Visibility (Visibility From All Sides). For Upper Body Garments Fluorescent Material Shall Be Evenly Distributed Around The Torso And/OR Upper Arms And/OR Limbs, If Any.		-			✓
For Lower Body Garments, Fluorescent Material Shall Be Evenly Distributed Around The Legs.		-			✓
Visibility From All Sides Shall Be Reached As Follows:					
- Not Less Than 40 % Of The Minimum Required Amount Of Fluorescent Material Specified In Table 3 Is Present On Both The Front And The Back When Laid Flat, And		-			✓
- Not Less Than 10 % Of The Minimum Required Amount Of Fluorescent Material Specified In Table 3 Is Present On Both The Right And Left Sides When Laid Flat On The Back (Respectively On The Front).		-			✓
5.3 Type B					
5.3.1 General					
These Garments Or Devices Shall In Their Design Use At Least The Minimum Amount Of Retroreflective Material According To Table 2 Or Table 3.		0.0192 m ²	✓		
5.3.2 Type B1 – Free Hanging Devices					
The Devices Shall Be Removable.		-			✓
The Total Area Of The Devices In Use Shall Meet The Requirements In Table 2.		-			✓
A Type B1 Device Shall Be Retroreflective From Both Sides.		-			✓

Design Requirements (EN 17353:2020, 5) (Cont)

Requirements	Test Data	Yes	No	N/A
Its Optical Active Area Shall Be A Minimum 15 cm ² Per Side. The Total Area Shall Be Maximum 50 cm ² Per Side. In Order To Achieve 360° Visibility (Visibility From All Sides) At Least Two Devices Shall Be Used, These Shall Be Used On The Left And The Right Side Of The Torso. This Shall Be Specified In The User Information.	-			✓
The Device Shall Be Flat And Its Maximum Thickness Shall Be 10 mm.	-			✓
The Means Of Attachment (String, Ribbon, Cord, Spiral, Etc.) Shall Be A Minimum 10 cm, In Length Between The Points Of Attachment On The Garment And That On The Reflector To Enable Free Movement Of The Device Around Its Vertical Axis And Allow A Pendulum Effect.	-			✓
5.3.3 Type B2 – Equipment For Limbs				
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 2.	0.0192 m ²	✓		
To Ensure 360° Visibility (Visibility From All Sides), One Or More Devices Shall Be Applied To Each Upper And/Or Each Lower Limb.	-	✓		
When Retroreflective Material Is Applied To A Garment It Shall Also Be Positioned To Achieve 360° Visibility (Visibility From All Sides). The Material Shall Be Placed On The Limbs So As To Ensure A Minimum Width Of 20 mm Encircling Each Limb.	30 mm	✓		
Any Gap In The Lengthwise Continuity Of The Retroreflective Material Shall Not Be Greater Than 50 mm, Measured Parallel To The Direction Of The Material, And The Total Of Such Gaps Shall Not Be Greater Than 50 mm Around The Limbs. Any Offset Not Greater Than The Width Of The Material Plus 5 mm Is Allowed.	-	✓		
Additionally, Separate Retroreflective Elements May Form Part Of An Applied Design In Conjunction With The Above. The Retroreflective Elements Shall Have A Minimum Area Of 25 cm ² Each.	-			✓
In The Case Of B2 Garments Covering Upper And Lower Limbs, The Retroreflective Material Can Be Applied On The Upper Limbs Only, On The Lower Limbs Only Or On Both The Upper And Lower Limbs. In The Latter Case, The Minimum Amount Of Table 2 Shall Be Used For Upper Limbs And Also For The Lower Limbs.	-	✓		
5.3.4 Type B3 – Equipment For The Torso Or The Torso And Limbs				
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 3. Garments And Devices Shall Be Measured Flat And In Their Smallest Configuration.	-			✓

Design Requirements (EN 17353:2020, 5) (Cont)

Requirements	Test Data	Yes	No	N/A
Retroreflective Material Shall Be Placed On The Torso So As To Ensure A Minimum Width Of 20 mm Encircling The Torso. Alternatively, Retroreflective Materials May Be Placed To Encircle The Upper Arms.	-			✓
If A B3 Garment Covers Limbs Below The Elbows Or Knees, Then Retroreflective Material On The Limbs Is Required. In This Case, Type B2 Requirements (See 5.3.3) For The Limbs Shall Be Fulfilled Whilst The Remainder Of The Material Shall Be Placed On The Torso. It Is Not Necessary For A Minimum 20 mm Wide Band To Be Applied On The Limbs In This Case.	-			✓
Additionally, Separate Retroreflective Elements May Form Part Of An Applied Design In Conjunction With The Above. The Retroreflective Elements Shall Have A Minimum Area Of 25 cm ² Each.	-			✓
Visibility From All Sides Shall Be Reached As Follows:				
- Not Less Than 40 % Of The Minimum Required Amount Of Retroreflective Material Specified In Table 3 Is Present On Both The Front And The Back When Laid Flat, And	-			✓
- Not Less Than 10 % Of The Minimum Required Amount Of Retroreflective Material Specified In Table 3 Is Present On Both The Right And Left Sides When Laid Flat On The Back (Respectively On The Front).	-			✓
Any Gap In The Lengthwise Continuity Of The Retroreflective Material Shall Not Be Greater Than 50 mm, Measured Parallel To The Direction Of The Material, And The Total Of Such Gaps Shall Not Be Greater Than 100 mm Around The Torso. Any Offset Not Greater Than The Width Of The Material Plus 5 mm Is Allowed.	-			✓
In The Case Of B3 Garments Covering The Torso, And The Upper And Lower Limbs, The Retroreflective Material Can Be Applied On The Torso And The Upper Limbs Only, On The Torso And Lower Limbs Only Or On Both The Torso And The Upper And Lower Limbs. In The Latter Case, The Minimum Amount Of Table 2 Shall Be Used For Upper Limbs And Also For The Lower Limbs.	-			✓
5.4 Type AB				
These Garments Shall In Their Design Use The Minimum Amount Of Fluorescent Material And Retroreflective Material Or Combined Performance Material Of Appropriate Group According To Table 3. Design Requirements For Type AB Clothing Shall Follow The Same Rules In Terms Of Distribution Of Fluorescent Material As Applied To Type A In 5.2.	-			✓

Design Requirements (EN 17353:2020, 5) (Cont)

Requirements	Test Data	Yes	No	N/A
Design Requirements For Type AB Clothing Shall Follow The Same Rules In Terms Of Distribution Of Reflective Material As Applied To Type B2 As In 5.3.3 Or Type B3 In 5.3.4.	-			✓
Combined Performance Material Shall Be Used Only In A Form That Maintains A Width Of ≥ 20 mm.	-			✓
When Using Combined Performance Material, The Area Of Fluorescent Material Can Be Reduced By The Amount Of Combined Performance Material Used.	-			✓

Remark:

Table 2 - Minimum Required Areas Of Material In m^2 For Types B1 And B2

	B1 ^a	B2 ^b
Retroreflective Material	0.003	0.018

^a Total Area Of Both Sides Of A Single Device.

^b If Devices, The Total Area Of Two Devices, Measured Flat.

Table 3 - Minimum Required Areas Of Material In m^2 For Types A, B3 And AB

	A	B3	AB	A	B3	AB
Height H Of The User	$h \leq 140 \text{ cm}^a$			$h > 140 \text{ cm}^a$		
Fluorescent Material	0.14	-	0.14	0.24	-	0.24
Retroreflective Material	-	0.06	0.06	-	0.08	0.08
Combined Performance Material	-	-	0.14	-	-	0.24

^a If The Height Range (Interval Figures As Described In EN ISO 13688:2013) Includes 140 cm (E.G. Garment Designed For Height Range From 138 cm To 142 cm), Then The Requirements As Stated In The Column "H > 140" Apply.

Compliance: The Submitted Sample **MEETS** The Design Requirements Of Type B2 Of EN 17353:2020, Clause 5.

- 3 Retroreflective Performance Of Separate Performance New Materials For Type B2, B3 And AB (EN 17353:2020, 6.3.3 & CIE 54.2:2001)

x-Direction (Horizontal: $\epsilon=0^\circ$)				
Observation Angle	Entrance Angle β_1 ($\beta_2=0$)	Coefficient Of Retroreflection	Requirement	Pass / Fail
12'	5°	742 cd/(lx·m ²)	Min. 330 cd/(lx·m ²) (*)	Pass
12'	20°	487 cd/(lx·m ²)	Min. 290 cd/(lx·m ²) (*)	Pass
12'	30°	375 cd/(lx·m ²)	Min. 180 cd/(lx·m ²) (*)	Pass
12'	40°	243 cd/(lx·m ²)	Min. 65 cd/(lx·m ²) (*)	Pass
20'	5°	748 cd/(lx·m ²)	Min. 250 cd/(lx·m ²) (*)	Pass
20'	20°	300 cd/(lx·m ²)	Min. 200 cd/(lx·m ²) (*)	Pass
20'	30°	232 cd/(lx·m ²)	Min. 170 cd/(lx·m ²) (*)	Pass
20'	40°	162 cd/(lx·m ²)	Min. 60 cd/(lx·m ²) (*)	Pass
1°	5°	64.0 cd/(lx·m ²)	Min. 25 cd/(lx·m ²) (*)	Pass
1°	20°	54.7 cd/(lx·m ²)	Min. 15 cd/(lx·m ²) (*)	Pass
1°	30°	76.2 cd/(lx·m ²)	Min. 12 cd/(lx·m ²) (*)	Pass
1°	40°	22.3 cd/(lx·m ²)	Min. 10 cd/(lx·m ²) (*)	Pass
1° 30'	5°	18.5 cd/(lx·m ²)	Min. 10 cd/(lx·m ²) (*)	Pass
1° 30'	20°	17.8 cd/(lx·m ²)	Min. 7 cd/(lx·m ²) (*)	Pass
1° 30'	30°	14.6 cd/(lx·m ²)	Min. 5 cd/(lx·m ²) (*)	Pass
1° 30'	40°	16.9 cd/(lx·m ²)	Min. 4 cd/(lx·m ²) (*)	Pass

Retroreflective Performance Of Separate Performance New Materials For Type B2, B3 And AB (EN 17353:2020, 6.3.3 & CIE 54.2:2001) (Cont)

y-Direction (Vertical: $\varepsilon=90^\circ$)				
Observation Angle	Entrance Angle β_1 ($\beta_2=0$)	Coefficient Of Retroreflection	Requirement	Pass / Fail
12'	5°	1009 cd/(lx·m ²)	Min. 248 cd/(lx·m ²) (*)	Pass
12'	20°	786 cd/(lx·m ²)	Min. 218 cd/(lx·m ²) (*)	Pass
12'	30°	647 cd/(lx·m ²)	Min. 135 cd/(lx·m ²) (*)	Pass
12'	40°	396 cd/(lx·m ²)	Min. 47 cd/(lx·m ²) (*)	Pass
20'	5°	824 cd/(lx·m ²)	Min. 188 cd/(lx·m ²) (*)	Pass
20'	20°	507 cd/(lx·m ²)	Min. 150 cd/(lx·m ²) (*)	Pass
20'	30°	340 cd/(lx·m ²)	Min. 128 cd/(lx·m ²) (*)	Pass
20'	40°	186 cd/(lx·m ²)	Min. 45 cd/(lx·m ²) (*)	Pass
1°	5°	132 cd/(lx·m ²)	Min. 18.8 cd/(lx·m ²) (*)	Pass
1°	20°	57.6 cd/(lx·m ²)	Min. 11.3 cd/(lx·m ²) (*)	Pass
1°	30°	47.0 cd/(lx·m ²)	Min. 9 cd/(lx·m ²) (*)	Pass
1°	40°	47.8 cd/(lx·m ²)	Min. 7.5 cd/(lx·m ²) (*)	Pass
1° 30'	5°	32.5 cd/(lx·m ²)	Min. 7.5 cd/(lx·m ²) (*)	Pass
1° 30'	20°	22.0 cd/(lx·m ²)	Min. 5.25 cd/(lx·m ²) (*)	Pass
1° 30'	30°	18.0 cd/(lx·m ²)	Min. 3.75 cd/(lx·m ²) (*)	Pass
1° 30'	40°	14.9 cd/(lx·m ²)	Min. 3 cd/(lx·m ²) (*)	Pass

Remark: * = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Orientation Sensitive Check Test (For Original Material)			
Sample Direction	Observation Angle	Entrance Angle 5°	Comment
x-Direction [Horizontal]	12'	742 cd/(lx·m ²)	If The Difference Between The X And Y Values Is Less Than 15% The Sample Is Not Considered Orientation Sensitive.
y-Direction [Vertical]	12'	1009 cd/(lx·m ²)	
Difference Between x & y Direction	267 cd/(lx·m ²)		
Difference Expressed As A Percentage (%)	35.9%		Sensitive

Expanded Uncertainty: 4.01%, With k = 1.96 At 95% Confidence Level.

- 4 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.1)

Test Exposure	Test Method
Abrasion	EN ISO 12947-2:2016, Using The Wool Fabric Abradant At A Pressure: 9 kPa, 5000 Cycles

x-Direction (Horizontal: $\varepsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	323 cd/(lx·m ²)	Min. 30 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\varepsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	401 cd/(lx·m ²)	Min. 22.5 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 3.99%, With k = 1.96 At 95% Confidence Level.

- 5 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.2)

Test Exposure	Test Method
Folding At Cold Temperatures	ISO 4675:2017, (-20±2)°C For 4h
Observation After Folding	No Cracking Or Loss Of Surface Material

x-Direction (Horizontal: $\epsilon=0^\circ$)					
Material Type	Observation angle α	Entrance angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	714 cd/(lx·m ²)	Min. 30 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\epsilon=90^\circ$)					
Material Type	Observation angle α	Entrance angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	866 cd/(lx·m ²)	Min. 22.5 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 4.23%, With k = 1.96 At 95% Confidence Level.

- 6 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.3)

Test Exposure	Test Method
Temperature Variation	a) For 12 h At $(50 \pm 2)^\circ\text{C}$; Immediately Followed By b) 20 h At $-(30 \pm 2)^\circ\text{C}$; And c) Conditioned For At Least 2 h At $(20 \pm 2)^\circ\text{C}$ And $(65 \pm 5) \% \text{ r.h.}$

x-Direction (Horizontal: $\epsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	603 cd/(lx·m ²)	Min. 30 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\epsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	686 cd/(lx·m ²)	Min. 22.5 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 4.17%, With k = 1.96 At 95% Confidence Level.

7 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.4)

Test Exposure	Test Method
Rainfall	EN ISO 20471:2013, 7.4.5

x-Direction (Horizontal: $\epsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	320 cd/(lx·m ²)	Min. 30 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\epsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Combined Performance Material & Orientation Sensitive Material	12'	5°	414 cd/(lx·m ²)	Min. 22.5 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 5.23%, With $k = 1.96$ At 95% Confidence Level.

8 pH Value

As Per ISO 13688:2013/Amd.1:2021, 4.2, With Reference To ISO 3071:2020 For Textile, Potassium Chloride (KCl) Solution Extracted, pH Value Was Measured By pH Meter.

Tested Component	Result	Requirement
Black Velvet Backing	6.3	*

Temperature Of The Extracting Solution: 23.7 °C

pH Of The Extracting Solution: 6.07

Remark: * = The pH Value Shall Be Greater Than 3.5 And Less Than 9.5

The Expanded Uncertainty Of The pH Value Of Specimen Is 15%, Which An Uncertainty With A Coverage Factor k=2, At Approximately 95% Confidence Level.

Conclusion:

Standard
ISO 13688:2013/Amd.1:2021 For pH Value

Result
Pass

9 Azo Colourants Content

With Reference To Test Method: Textile Method (ISO 14362-1:2017)

Amines Content Was Determined By Gas Chromatography-Mass Spectrometry (GC-MS)

	Forbidden Amine	CAS No.	Results (mg/kg)	
			Method T	Method D
1.	4-Aminodiphenyl	92-67-1	<5	<5
2.	Benzidine	92-87-5	<5	<5
3.	4-Chloro-o-toluidine	95-69-2	<5	<5
4.	2-Naphthylamine	91-59-8	<5	<5
5.	o-Aminoazotoluene	97-56-3	<5	<5
6.	2-Amino-4-nitrotoluene	99-55-8	<5	<5
7.	p-Chloroaniline	106-47-8	<5	<5
8.	2,4-Diaminoanisole	615-05-4	<5	<5
9.	4,4'-Diaminodiphenylmethane	101-77-9	<5	<5
10.	3,3'-Dichlorobenzidine	91-94-1	<5	<5
11.	3,3'-Dimethoxybenzidine	119-90-4	<5	<5
12.	3,3'-Dimethylbenzidine	119-93-7	<5	<5
13.	3,3'-Dimethyl-4,4'-diaminodiphenylmethane	838-88-0	<5	<5
14.	p-Cresidine	120-71-8	<5	<5
15.	4,4'-Methylene-bis(2-chloroaniline)	101-14-4	<5	<5
16.	4,4'-Oxydianiline	101-80-4	<5	<5
17.	4,4'-Thiodianiline	139-65-1	<5	<5
18.	o-Toluidine	95-53-4	<5	<5
19.	2,4-Toluylenediamine	95-80-7	<5	<5
20.	2,4,5-Trimethylaniline	137-17-7	<5	<5
21.	o-Anisidine	90-04-0	<5	<5
22.	4-Aminoazobenzene	60-09-3	<5	<5

Remark: Requirement = 30 mg/kg

Reporting limit = 5 mg/kg

Method T: Direct Buffer Extraction As Per ISO 14362-1:2017 Section 10.2

Method D: Colourant Extraction With Xylene As Per ISO 14362-1:2017 Section 10.1

Tested Component: Black Velvet Backing

Conclusion:

Standard

ISO 13688:2013/Amd.1:2021 Protective Clothing -
General Requirements - Azo Colourants Content

Result

Pass



End Of Report

This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or wilful misconduct. No copy of the test report(except for full text copy) shall be made without the written approval by Intertek.

Remark:

1. As Requested by the Applicant, For Details Refer to Attached Page (5).
2. All the tested item are tested under the standard condition.
3. The report is valid with commission test only for the test samples in the case of delivering samples by clients.



Total Quality. Assured.

TEST REPORT



中国认可
国际互认
检测
TESTING
CNAS L0220

Number: GZHT91331808

Date: Apr 30, 2025

Applicant: MID OCEAN BRANDS B.V.
7/F, KINGS TOWER, 111 KING LAM STREET,
CHEUNG SHA WAN, KOWLOON, HONG KONG

Attn: DEREK HUI

Sample Description:

Fifteen (15) pieces of submitted samples said to be Silver reflective arm straps foldable with square pattern and black velvet backing.

Standard	:	EN 17353:2020
Styles No./Name	:	KC8282-14
Colour	:	Silver
Manufacturer	:	116209
Country Of Original	:	CHINA
Goods Exported to	:	Europe
Date of Sample Received	:	Apr. 23, 2025
Testing Period	:	Apr. 23, 2025 – Apr. 28, 2025
Date Final Information Confirmed/	:	--/--
Date Payment Received:	:	

Test Result Please Refer To Attached Page(S).

Should you have any query on this report, you may contact at gzfootwear@intertek.com

Authorized By:
For Intertek Testing Services Shenzhen Ltd.
Guangzhou Branch

Guiliang Dong
Senior Lab Manager



Page 1 Of 13

WQ / stellaxue

Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
深圳天祥质量技术服务有限公司广州分公司
Room 401/501/601/801/901/1003, No. 8, East BaoYing Road, Huangpu District, Guangzhou 510730
广州市黄埔区保盈东路8号401房、501房、601房、801房、901房、1003房
Tel: +86 20 2820 9114 Postcode: 510730

www.intertek.com

检验检测专用章

SHENZHEN BRANCH

(6)

1 Types And Minimum Area Requirements (EN 17353:2020, 4)

4.1 Types

Size	-			
Requirements		Yes	No	N/A
The Enhanced Visibility Equipment Is Grouped Into Three Types Based On The Foreseeable Conditions Of Use:				
- Type A	Equipment Worn By Users Where The Risk Of Not Being Seen Exists Only At Daylight Conditions. This Equipment Uses Only The Fluorescent Material As Enhanced Visibility Component.			√
- Type B	Equipment Worn By Users Where Risk Of Not Being Seen Exists Only At Dark Conditions. This Equipment Uses Only The Retroreflective Material As Enhanced Visibility Component.	√		
Type B Is Subdivided In 3 Levels, As Below. The Classification Depends On The Total Area Worn Or On Placement Of The Device On User's Torso And Limbs:				
-	Type B1 Includes Free Hanging Retroreflective Devices Only; These Devices Are Designed For Movement Recognition.			√
-	Type B2 Includes Retroreflective Devices Or Retroreflective Material Either Temporarily Or Permanently Placed On Limbs Only; These Products Are Designed For Movement Recognition. As A Minimum, The Retroreflective Material Shall Be Positioned On The Limbs As A Separate Removable Device Or Shall Be Incorporated Into Clothing Design On A Permanent Basis As A Retroreflective Element.	√		
-	Type B3 Includes Retroreflective Material Placed On Torso Or Torso And Limbs. These Products Are Designed For Form Recognition, Or Form And Movement Recognition. Type B3 Items Shall Not Be A Combination Of Permanently Attached Reflective Material And Removable Reflective Devices.			√
- Type AB	Equipment Worn By Users Where Risk Of Not Being Seen Exists During Daylight, Twilight And Dark Conditions. This Equipment Uses The Fluorescent As Well As The Retroreflective And/or Combined Performance Materials As Enhanced Visibility Components.			√
	For Each Type, The Relevant Material Requirements In Clause 6 Shall Be Fulfilled In Accordance To Clause 7.	√		

4.2 Minimum Area Requirements

Areas Of Material For Types B1 And B2			
Type	Retroreflective Materials	Requirement	Pass/Fail
B2	0.0192 m ²	0.018 m ² (*1)	Pass

Remark: *1 = If Devices, The Total Area Of Two Devices, Measured Flat.

NOTE: The Area Of Visibility Material Shown In Table 3 Cannot Be Reduced Below The Minimum Requirements By The Application Of Logos, Lettering, Labels, Etc.

2 Design Requirements (EN 17353:2020, 5)

Size	-				
Requirements		Test Data	Yes	No	N/A
5.1 Size Designation					
The Size Designation For Garments Shall Be In Accordance With The Requirements Of EN ISO 13688:2013.		-			√
5.2 Type A					
5.2.1 General					
Type A Garments (Including Partial Body Protective Clothing) Shall In Their Design Use At Least The Minimum Amount Of Fluorescent Material According To Table 3.		-			√
5.2.2 Visibility From All Sides					
Type A Garments Shall Be Made Up Of Fluorescent Material On All Sides To Ensure 360° Visibility (Visibility From All Sides). For Upper Body Garments Fluorescent Material Shall Be Evenly Distributed Around The Torso And/OR Upper Arms And/OR Limbs, If Any.		-			√
For Lower Body Garments, Fluorescent Material Shall Be Evenly Distributed Around The Legs.		-			√
Visibility From All Sides Shall Be Reached As Follows:					
- Not Less Than 40 % Of The Minimum Required Amount Of Fluorescent Material Specified In Table 3 Is Present On Both The Front And The Back When Laid Flat, And		-			√
- Not Less Than 10 % Of The Minimum Required Amount Of Fluorescent Material Specified In Table 3 Is Present On Both The Right And Left Sides When Laid Flat On The Back (Respectively On The Front).		-			√
5.3 Type B					
5.3.1 General					
These Garments Or Devices Shall In Their Design Use At Least The Minimum Amount Of Retroreflective Material According To Table 2 Or Table 3.		0.0192 m ²	√		

Design Requirements (Cont)

Size	-				
Requirements		Test Data	Yes	No	N/A
5.3.2 Type B1 – Free Hanging Devices					
The Devices Shall Be Removable.		-			√
The Total Area Of The Devices In Use Shall Meet The Requirements In Table 2.		-			√
A Type B1 Device Shall Be Retroreflective From Both Sides.		-			√
Its Optical Active Area Shall Be A Minimum 15 cm ² Per Side. The Total Area Shall Be Maximum 50 cm ² Per Side. In Order To Achieve 360° Visibility (Visibility From All Sides) At Least Two Devices Shall Be Used, These Shall Be Used On The Left And The Right Side Of The Torso. This Shall Be Specified In The User Information.		-			√
The Device Shall Be Flat And Its Maximum Thickness Shall Be 10 mm.		-			√
The Means Of Attachment (String, Ribbon, Cord, Spiral, Etc.) Shall Be A Minimum 10 cm, In Length Between The Points Of Attachment On The Garment And That On The Reflector To Enable Free Movement Of The Device Around Its Vertical Axis And Allow A Pendulum Effect.		-			√
5.3.3 Type B2 – Equipment For Limbs					
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 2.		0.0192 m ²	√		
To Ensure 360° Visibility (Visibility From All Sides), One Or More Devices Shall Be Applied To Each Upper And/Or Each Lower Limb.		-	√		
When Retroreflective Material Is Applied To A Garment It Shall Also Be Positioned To Achieve 360° Visibility (Visibility From All Sides). The Material Shall Be Placed On The Limbs So As To Ensure A Minimum Width Of 20 mm Encircling Each Limb.		30 mm	√		
Any Gap In The Lengthwise Continuity Of The Retroreflective Material Shall Not Be Greater Than 50 mm, Measured Parallel To The Direction Of The Material, And The Total Of Such Gaps Shall Not Be Greater Than 50 mm Around The Limbs. Any Offset Not Greater Than The Width Of The Material Plus 5 mm Is Allowed.		-	√		
Additionally, Separate Retroreflective Elements May Form Part Of An Applied Design In Conjunction With The Above. The Retroreflective Elements Shall Have A Minimum Area Of 25 cm ² Each.		-			√
In The Case Of B2 Garments Covering Upper And Lower Limbs, The Retroreflective Material Can Be Applied On The Upper Limbs Only, On The Lower Limbs Only Or On Both The Upper And Lower Limbs. In The Latter Case, The Minimum Amount Of Table 2 Shall Be Used For Upper Limbs And Also For The Lower Limbs.		-	√		

Design Requirements (Cont)

Size	-				
Requirements		Test Data	Yes	No	N/A
5.3.4 Type B3 – Equipment For The Torso Or The Torso And Limbs					
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 3. Garments And Devices Shall Be Measured Flat And In Their Smallest Configuration.		-			√
Retroreflective Material Shall Be Placed On The Torso So As To Ensure A Minimum Width Of 20 mm Encircling The Torso. Alternatively, Retroreflective Materials May Be Placed To Encircle The Upper Arms.		-			√
If A B3 Garment Covers Limbs Below The Elbows Or Knees, Then Retroreflective Material On The Limbs Is Required. In This Case, Type B2 Requirements (See 5.3.3) For The Limbs Shall Be Fulfilled Whilst The Remainder Of The Material Shall Be Placed On The Torso. It Is Not Necessary For A Minimum 20 mm Wide Band To Be Applied On The Limbs In This Case.		-			√
Additionally, Separate Retroreflective Elements May Form Part Of An Applied Design In Conjunction With The Above. The Retroreflective Elements Shall Have A Minimum Area Of 25 cm ² Each.		-			√
Visibility From All Sides Shall Be Reached As Follows:					
- Not Less Than 40 % Of The Minimum Required Amount Of Retroreflective Material Specified In Table 3 Is Present On Both The Front And The Back When Laid Flat, And		-			√
- Not Less Than 10 % Of The Minimum Required Amount Of Retroreflective Material Specified In Table 3 Is Present On Both The Right And Left Sides When Laid Flat On The Back (Respectively On The Front).		-			√
Any Gap In The Lengthwise Continuity Of The Retroreflective Material Shall Not Be Greater Than 50 mm, Measured Parallel To The Direction Of The Material, And The Total Of Such Gaps Shall Not Be Greater Than 100 mm Around The Torso. Any Offset Not Greater Than The Width Of The Material Plus 5 mm Is Allowed.		-			√
In The Case Of B3 Garments Covering The Torso, And The Upper And Lower Limbs, The Retroreflective Material Can Be Applied On The Torso And The Upper Limbs Only, On The Torso And Lower Limbs Only Or On Both The Torso And The Upper And Lower Limbs. In The Latter Case, The Minimum Amount Of Table 2 Shall Be Used For Upper Limbs And Also For The Lower Limbs.		-			√

Design Requirements (Cont)

Size	-				
Requirements		Test Data	Yes	No	N/A
5.4 Type AB					
These Garments Shall In Their Design Use The Minimum Amount Of Fluorescent Material And Retroreflective Material Or Combined Performance Material Of Appropriate Group According To Table 3. Design Requirements For Type AB Clothing Shall Follow The Same Rules In Terms Of Distribution Of Fluorescent Material As Applied To Type A In 5.2.		-			√
Design Requirements For Type AB Clothing Shall Follow The Same Rules In Terms Of Distribution Of Reflective Material As Applied To Type B2 As In 5.3.3 Or Type B3 In 5.3.4.		-			√
Combined Performance Material Shall Be Used Only In A Form That Maintains A Width Of ≥ 20 mm.		-			√
When Using Combined Performance Material, The Area Of Fluorescent Material Can Be Reduced By The Amount Of Combined Performance Material Used.		-			√

Remark:

Table 2 - Minimum Required Areas Of Material In m² For Types B1 And B2

	B1 ^a	B2 ^b
Retroreflective Material	0.003	0.018

^a Total Area Of Both Sides Of A Single Device.

^b If Devices, The Total Area Of Two Devices, Measured Flat.

Table 3 - Minimum Required Areas Of Material In m² For Types A, B3 And AB

	A	B3	AB	A	B3	AB
Height H Of The User	$h \leq 140$ cm ^a			$h > 140$ cm ^a		
Fluorescent Material	0.14	-	0.14	0.24	-	0.24
Retroreflective Material	-	0.06	0.06	-	0.08	0.08
Combined Performance Material	-	-	0.14	-	-	0.24

^a If The Height Range (Interval Figures As Described In EN ISO 13688:2013) Includes 140 cm (E.G. Garment Designed For Height Range From 138 cm To 142 cm), Then The Requirements As Stated In The Column "H > 140" Apply.

Compliance: The Submitted Sample **MEETS** The Design Requirements Of Type B2 Of EN 17353:2020, Clause 5.

- 3 Retroreflective Performance Of Separate Performance New Materials For Type B2, B3 And AB (EN 17353:2020, 6.3.3 & CIE 54.2:2001)

x-Direction (Horizontal: $\epsilon=0^\circ$)				
Observation Angle	Entrance Angle β_1 ($\beta_2=0$)	Coefficient Of Retroreflection	Requirement	Pass / Fail
12'	5°	1020 cd/(lx·m ²)	Min. 330 cd/(lx·m ²) (*)	Pass
12'	20°	776 cd/(lx·m ²)	Min. 290 cd/(lx·m ²) (*)	Pass
12'	30°	654 cd/(lx·m ²)	Min. 180 cd/(lx·m ²) (*)	Pass
12'	40°	372 cd/(lx·m ²)	Min. 65 cd/(lx·m ²) (*)	Pass
20'	5°	736 cd/(lx·m ²)	Min. 250 cd/(lx·m ²) (*)	Pass
20'	20°	587 cd/(lx·m ²)	Min. 200 cd/(lx·m ²) (*)	Pass
20'	30°	361 cd/(lx·m ²)	Min. 170 cd/(lx·m ²) (*)	Pass
20'	40°	204 cd/(lx·m ²)	Min. 60 cd/(lx·m ²) (*)	Pass
1°	5°	81.9 cd/(lx·m ²)	Min. 25 cd/(lx·m ²) (*)	Pass
1°	20°	44.7 cd/(lx·m ²)	Min. 15 cd/(lx·m ²) (*)	Pass
1°	30°	47.0 cd/(lx·m ²)	Min. 12 cd/(lx·m ²) (*)	Pass
1°	40°	19.8 cd/(lx·m ²)	Min. 10 cd/(lx·m ²) (*)	Pass
1° 30'	5°	22.7 cd/(lx·m ²)	Min. 10 cd/(lx·m ²) (*)	Pass
1° 30'	20°	21.1 cd/(lx·m ²)	Min. 7 cd/(lx·m ²) (*)	Pass
1° 30'	30°	13.6 cd/(lx·m ²)	Min. 5 cd/(lx·m ²) (*)	Pass
1° 30'	40°	11.5 cd/(lx·m ²)	Min. 4 cd/(lx·m ²) (*)	Pass

Retroreflective Performance Of Separate Performance New Materials For Type B2, B3 And AB (Cont)

y-Direction (Vertical: $\varepsilon=90^\circ$)				
Observation Angle	Entrance Angle β_1 ($\beta_2=0$)	Coefficient Of Retroreflection	Requirement	Pass / Fail
12'	5°	672 cd/(lx·m ²)	Min. 248 cd/(lx·m ²) (*)	Pass
12'	20°	455 cd/(lx·m ²)	Min. 218 cd/(lx·m ²) (*)	Pass
12'	30°	415 cd/(lx·m ²)	Min. 135 cd/(lx·m ²) (*)	Pass
12'	40°	210 cd/(lx·m ²)	Min. 47 cd/(lx·m ²) (*)	Pass
20'	5°	680 cd/(lx·m ²)	Min. 188 cd/(lx·m ²) (*)	Pass
20'	20°	283 cd/(lx·m ²)	Min. 150 cd/(lx·m ²) (*)	Pass
20'	30°	238 cd/(lx·m ²)	Min. 128 cd/(lx·m ²) (*)	Pass
20'	40°	128 cd/(lx·m ²)	Min. 45 cd/(lx·m ²) (*)	Pass
1°	5°	107 cd/(lx·m ²)	Min. 18.8 cd/(lx·m ²) (*)	Pass
1°	20°	130 cd/(lx·m ²)	Min. 11.3 cd/(lx·m ²) (*)	Pass
1°	30°	111 cd/(lx·m ²)	Min. 9 cd/(lx·m ²) (*)	Pass
1°	40°	34.1 cd/(lx·m ²)	Min. 7.5 cd/(lx·m ²) (*)	Pass
1° 30'	5°	57.4 cd/(lx·m ²)	Min. 7.5 cd/(lx·m ²) (*)	Pass
1° 30'	20°	38.0 cd/(lx·m ²)	Min. 5.25 cd/(lx·m ²) (*)	Pass
1° 30'	30°	35.7 cd/(lx·m ²)	Min. 3.75 cd/(lx·m ²) (*)	Pass
1° 30'	40°	25.1 cd/(lx·m ²)	Min. 3 cd/(lx·m ²) (*)	Pass

Remark: * = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Orientation Sensitive Check Test (For Original Material)			
Sample Direction	Observation Angle	Entrance Angle 5°	Comment
x-Direction [Horizontal]	12'	1020 cd/(lx·m ²)	If The Difference Between The X And Y Values Is Less Than 15% The Sample Is Not Considered Orientation Sensitive.
y-Direction [Vertical]	12'	672 cd/(lx·m ²)	
Difference Between x & y Direction	348 cd/(lx·m ²)		
Difference Expressed As A Percentage (%)	34.1%		Sensitive

Expanded Uncertainty: 4.01%, With k = 1.96 At 95% Confidence Level.

- 4 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.1)

Test Exposure	Test Method
Abrasion	EN ISO 12947-2:2016, Using The Wool Fabric Abradant At A Pressure: 9 kPa, 5000 Cycles

x-Direction (Horizontal: $\varepsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	513 cd/(lx·m ²)	Min. 100 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\varepsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	482 cd/(lx·m ²)	Min. 75 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 3.99%, With k = 1.96 At 95% Confidence Level.

- 5 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.2)

Test Exposure	Test Method
Folding At Cold Temperatures	ISO 4675:2017, (-20±2)°C For 4h
Observation After Folding	No Cracking Or Loss Of Surface Material

x-Direction (Horizontal: $\varepsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	788 cd/(lx·m ²)	Min. 100 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\varepsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	775 cd/(lx·m ²)	Min. 75 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 4.23%, With k = 1.96 At 95% Confidence Level.

- 6 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.3)

Test Exposure	Test Method
Temperature Variation	a) For 12 h At $(50 \pm 2)^{\circ}\text{C}$; Immediately Followed By b) 20 h At $-(30 \pm 2)^{\circ}\text{C}$; And c) Conditioned For At Least 2 h At $(20 \pm 2)^{\circ}\text{C}$ And $(65 \pm 5)\%$ r.h.

x-Direction (Horizontal: $\varepsilon=0^{\circ}$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^{\circ}$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	697 cd/(lx·m ²)	Min. 100 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\varepsilon=90^{\circ}$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^{\circ}$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	663 cd/(lx·m ²)	Min. 75 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 4.17%, With k = 1.96 At 95% Confidence Level.

7 Retroreflection Performance After Test Exposure For Type B2 And B3 And Type AB (EN 17353:2020, 6.4.1 & 7.4.4)

Test Exposure	Test Method
Rainfall	EN ISO 20471:2013, 7.4.5

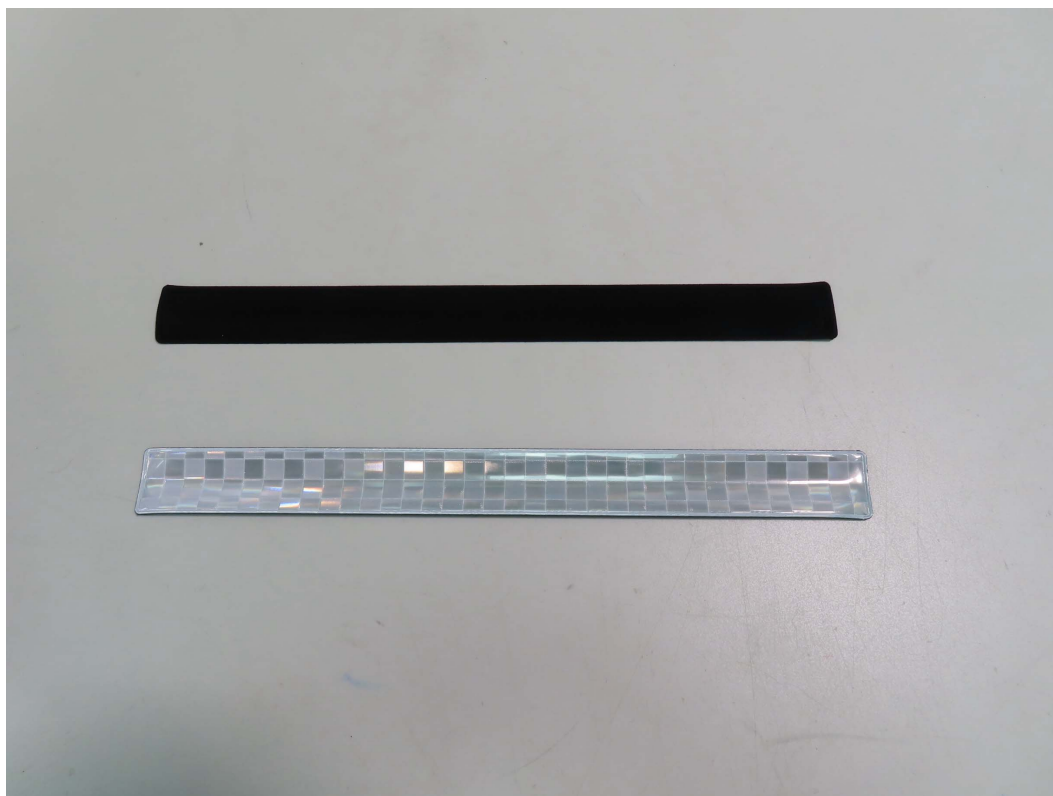
x-Direction (Horizontal: $\varepsilon=0^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	192 cd/(lx·m ²)	Min. 100 cd/(lx·m ²)(*)	Pass

y-Direction (Vertical: $\varepsilon=90^\circ$)					
Material Type	Observation Angle α	Entrance Angle β_1 ($\beta_2 = 0^\circ$)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12'	5°	157 cd/(lx·m ²)	Min. 75 cd/(lx·m ²)(*)	Pass

Remark:

* = If A Sample Is Defined As Orientation Sensitive In Orientation Sensitive Check Test, The Coefficient Of Retroreflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroreflection At The Other Rotation Angle Shall Comply With Not Less Than 75% Of The Minimum Requirement.

Expanded Uncertainty: 5.23%, With k = 1.96 At 95% Confidence Level.



End Of Report

This report is made solely on the basis of your instructions and/or information and materials supplied by you. It is not intended to be a recommendation for any particular course of action. Intertek does not accept a duty of care or any other responsibility to any person other than the Client in respect of this report and only accepts liability to the Client insofar as is expressly contained in the terms and conditions governing Intertek's provision of services to you. Intertek makes no warranties or representations either express or implied with respect to this report save as provided for in those terms and conditions. We have aimed to conduct the Review on a diligent and careful basis and we do not accept any liability to you for any loss arising out of or in connection with this report, in contract, tort, by statute or otherwise, except in the event of our gross negligence or wilful misconduct. No copy of the test report(except for full text copy) shall be made without the written approval by Intertek.

Remark:

1. As Requested by the Applicant, For Details Refer to Attached Page (5).
2. All the tested item are tested under the standard condition.
3. The report is valid with commission test only for the test samples in the case of delivering samples by clients.