Total Quality. Assured.

TEST REPORT

Number: GZHT91180605

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

Date: Apr 17, 2023

Sample Description:

Forty (40) pieces of submitted sample said to be Yellow reflective arm straps foldable with Black velvet backing

Standard	:	EN 17353:2020
Colour	:	Yellow
Size (s) Range	:	L & XL
Styles/Models No.	:	KC8282-08
Manufacturer	:	116209
Country Of Original	:	China
Goods Exported To	:	Europe
Date Received/Date Test Started:		Mar 31, 2023
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

wx/bonnieliu

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

4.1 Types

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

Size: L			
Areas Of Material For Types B1 And B2			
Type	Retroreflective Materials	Requirement	Pass/Fail
B2	0.0203 m^2	0.018 m^2 (*1)	Pass

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

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: +86 020-28209114 Postcode:510730
www.intertek.com

2 Design Requirements (EN 17353:2020, 5)

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.	0.0203 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.	-			√
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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

Requirements	Test Data	Yes	No	N/A
5.3.3 Type B2 – Equipment For Limbs				
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 2.	0.0203 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.	-			√
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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

Requirements	Test Data	Yes	No	N/A
5.3.4 Type B3 – Equipment For The Torso Or The Torso And Limbs				
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 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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

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 ≤ 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

x-Direction (Horizontal: ε=0°)				
Observation Angle	Entrance Angle β_1 (β_2=0)	Coefficient Of Retroreflection	Requirement	Pass/Fail
12′	5°	504 cd/(lx·m^2)	Min. 330 cd/(lx·m^2) (*)	Pass
12′	20°	446 cd/(lx·m^2)	Min. 290 cd/(lx·m^2) (*)	Pass
12′	30°	450 cd/(lx·m^2)	Min. 180 cd/(lx·m^2) (*)	Pass
12′	40°	289 cd/(lx·m^2)	Min. 65 cd/(lx·m^2) (*)	Pass
20′	5°	470 cd/(lx·m^2)	Min. 250 cd/(lx·m^2) (*)	Pass
20′	20°	310 cd/(lx·m^2)	Min. 200 cd/(lx·m^2) (*)	Pass
20′	30°	254 cd/(lx·m^2)	Min. 170 cd/(lx·m^2) (*)	Pass
20′	40°	177 cd/(lx·m^2)	Min. 60 cd/(lx·m^2) (*)	Pass
1°	5°	47.5 cd/(lx·m^2)	Min. 25 cd/(lx·m^2) (*)	Pass
1°	20°	44.1 cd/(lx·m^2)	Min. 15 cd/(lx·m^2) (*)	Pass
1°	30°	47.3 cd/(lx·m^2)	Min. 12 cd/(lx·m^2) (*)	Pass
1°	40°	37.0 cd/(lx·m^2)	Min. 10 cd/(lx·m^2) (*)	Pass
1° 30′	5°	19.3 cd/(lx·m^2)	Min. 10 cd/(lx·m^2) (*)	Pass
1° 30′	20°	15.5 cd/(lx·m^2)	Min. 7 cd/(lx·m^2) (*)	Pass
1° 30′	30°	14.9 cd/(lx·m^2)	Min. 5 cd/(lx·m^2) (*)	Pass
1° 30′	40°	13.7 cd/(lx·m^2)	Min. 4 cd/(lx·m^2) (*)	Pass

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

y-Direction (Vertical: ε=90°)				
Observation Angle	Entrance Angle β_1 (β_2=0)	Coefficient Of Retroreflection	Requirement	Pass/Fail
12′	5°	894 cd/(lx·m^2)	Min. 248 cd/(lx·m^2) (*)	Pass
12′	20°	642 cd/(lx·m^2)	Min. 218 cd/(lx·m^2) (*)	Pass
12′	30°	563 cd/(lx·m^2)	Min. 135 cd/(lx·m^2) (*)	Pass
12′	40°	322 cd/(lx·m^2)	Min. 47 cd/(lx·m^2) (*)	Pass
20′	5°	573 cd/(lx·m^2)	Min. 188 cd/(lx·m^2) (*)	Pass
20′	20°	493 cd/(lx·m^2)	Min. 150 cd/(lx·m^2) (*)	Pass
20′	30°	380 cd/(lx·m^2)	Min. 128 cd/(lx·m^2) (*)	Pass
20′	40°	230 cd/(lx·m^2)	Min. 45 cd/(lx·m^2) (*)	Pass
1°	5°	137 cd/(lx·m^2)	Min. 18.8 cd/(lx·m^2) (*)	Pass
1°	20°	92.2 cd/(lx·m^2)	Min. 11.3 cd/(lx·m^2) (*)	Pass
1°	30°	76.5 cd/(lx·m^2)	Min. 9 cd/(lx·m^2) (*)	Pass
1°	40°	43.3 cd/(lx·m^2)	Min. 7.5 cd/(lx·m^2) (*)	Pass
1° 30′	5°	37.9 cd/(lx·m^2)	Min. 7.5 cd/(lx·m^2) (*)	Pass
1° 30′	20°	27.9 cd/(lx·m^2)	Min. 5.25 cd/(lx·m^2) (*)	Pass
1° 30′	30°	30.2 cd/(lx·m^2)	Min. 3.75 cd/(lx·m^2) (*)	Pass
1° 30′	40°	21.8 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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′	504 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′	894 cd/(lx·m^2)	
Difference Between x & y Direction	390 cd/(lx·m^2)		
Difference Expressed As A Percentage (%)	77.4%		Sensitive

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

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: +86 020-28209114 Postcode:510730
www.intertek.com

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: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	361 cd/(lx·m^2)	Min. 30 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	438 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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)℃ For 4 h
Observation After Folding	No Cracking Or Loss Of Surface Material

x-Direction (Horizontal: ε=0°)					
Material Type	Observation Angle α	Entrance angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	452 cd/(lx·m^2)	Min. 30 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	806 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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±2)℃; Immediately Followed By b) 20 h At (-30±2)℃; And c) Conditioned For At Least 2 h At (20±2)℃ And (65±5)% r.h.

x-Direction (Horizontal: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	525 cd/(lx·m^2)	Min. 30 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	848 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	192 cd/(lx·m^2)	Min. 30 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Orientation Sensitive & Combined Performance Material	12′	5°	289 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

End of Report

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: +86 020-28209114 Postcode:510730
www.intertek.com

Total Quality. Assured.

TEST REPORT

Number: GZHT91180607

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

Date: Apr 17, 2023

Sample Description:

Forty (40) pieces of submitted samples said to be Silver reflective arm straps foldable with square pattern and Black velvet backing

Standard	:	EN 17353:2020 ISO 13688:2013/AMD.1:2021
Colour	:	Silver
Size (s) Range	:	L & XL
Styles/Models No.	:	KC8282-14
Manufacturer	:	116209
Country Of Original	:	China
Goods Exported To	:	Europe
Date Received/Date Test Started:		Mar 31, 2023
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

Vivian Li
Assistant Technical Manager

wx/bonnieliu

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

4.1 Types

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

Size: L			
Areas Of Material For Types B1 And B2			
Type	Retroreflective Materials	Requirement	Pass/Fail
B2	0.0203 m^2	0.018 m^2 (*1)	Pass

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

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: +86 020-28209114 Postcode:510730
www.intertek.com

2 Design Requirements (EN 17353:2020, 5)

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.	0.0203 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.	-			√
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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

Requirements	Test Data	Yes	No	N/A
5.3.3 Type B2 – Equipment For Limbs				
The Minimum Area Of Retroreflective Material Shall Fulfil The Requirements In Table 2.	0.0203 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.	-			√
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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

Requirements	Test Data	Yes	No	N/A
5.3.4 Type B3 – Equipment For The Torso Or The Torso And Limbs				
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 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.	-			√

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

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 ≤ 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

x-Direction (Horizontal: ε=0°)				
Observation Angle	Entrance Angle β_1 (β_2=0)	Coefficient Of Retroreflection	Requirement	Pass/Fail
12′	5°	1187 cd/(lx·m^2)	Min. 330 cd/(lx·m^2) (*)	Pass
12′	20°	893 cd/(lx·m^2)	Min. 290 cd/(lx·m^2) (*)	Pass
12′	30°	764 cd/(lx·m^2)	Min. 180 cd/(lx·m^2) (*)	Pass
12′	40°	479 cd/(lx·m^2)	Min. 65 cd/(lx·m^2) (*)	Pass
20′	5°	883 cd/(lx·m^2)	Min. 250 cd/(lx·m^2) (*)	Pass
20′	20°	704 cd/(lx·m^2)	Min. 200 cd/(lx·m^2) (*)	Pass
20′	30°	500 cd/(lx·m^2)	Min. 170 cd/(lx·m^2) (*)	Pass
20′	40°	249 cd/(lx·m^2)	Min. 60 cd/(lx·m^2) (*)	Pass
1°	5°	138 cd/(lx·m^2)	Min. 25 cd/(lx·m^2) (*)	Pass
1°	20°	93.9 cd/(lx·m^2)	Min. 15 cd/(lx·m^2) (*)	Pass
1°	30°	82.0 cd/(lx·m^2)	Min. 12 cd/(lx·m^2) (*)	Pass
1°	40°	29.5 cd/(lx·m^2)	Min. 10 cd/(lx·m^2) (*)	Pass
1° 30′	5°	30.4 cd/(lx·m^2)	Min. 10 cd/(lx·m^2) (*)	Pass
1° 30′	20°	24.2 cd/(lx·m^2)	Min. 7 cd/(lx·m^2) (*)	Pass
1° 30′	30°	30.9 cd/(lx·m^2)	Min. 5 cd/(lx·m^2) (*)	Pass
1° 30′	40°	16.8 cd/(lx·m^2)	Min. 4 cd/(lx·m^2) (*)	Pass

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

y-Direction (Vertical: ε=90°)				
Observation Angle	Entrance Angle β_1 (β_2=0)	Coefficient Of Retroreflection	Requirement	Pass/Fail
12′	5°	592 cd/(lx·m^2)	Min. 248 cd/(lx·m^2) (*)	Pass
12′	20°	309 cd/(lx·m^2)	Min. 218 cd/(lx·m^2) (*)	Pass
12′	30°	220 cd/(lx·m^2)	Min. 135 cd/(lx·m^2) (*)	Pass
12′	40°	123 cd/(lx·m^2)	Min. 47 cd/(lx·m^2) (*)	Pass
20′	5°	790 cd/(lx·m^2)	Min. 188 cd/(lx·m^2) (*)	Pass
20′	20°	272 cd/(lx·m^2)	Min. 150 cd/(lx·m^2) (*)	Pass
20′	30°	180 cd/(lx·m^2)	Min. 128 cd/(lx·m^2) (*)	Pass
20′	40°	79.9 cd/(lx·m^2)	Min. 45 cd/(lx·m^2) (*)	Pass
1°	5°	89.7 cd/(lx·m^2)	Min. 18.8 cd/(lx·m^2) (*)	Pass
1°	20°	88.7 cd/(lx·m^2)	Min. 11.3 cd/(lx·m^2) (*)	Pass
1°	30°	71.4 cd/(lx·m^2)	Min. 9 cd/(lx·m^2) (*)	Pass
1°	40°	16.4 cd/(lx·m^2)	Min. 7.5 cd/(lx·m^2) (*)	Pass
1° 30′	5°	29.4 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°	30.1 cd/(lx·m^2)	Min. 3.75 cd/(lx·m^2) (*)	Pass
1° 30′	40°	11.9 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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′	1187 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′	592 cd/(lx·m^2)	
Difference Between x & y Direction	595 cd/(lx·m^2)		
Difference Expressed As A Percentage (%)	50.1%		Sensitive

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

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: +86 020-28209114 Postcode:510730
www.intertek.com

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: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	1086 cd/(lx·m^2)	Min. 100 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	491 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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)℃ For 4 h
Observation After Folding	No Cracking Or Loss Of Surface Material

x-Direction (Horizontal: ε=0°)					
Material Type	Observation Angle α	Entrance angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	1078 cd/(lx·m^2)	Min. 100 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	715 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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±2)℃; Immediately Followed By b) 20 h At (-30±2)℃; And c) Conditioned For At Least 2 h At (20±2)℃ And (65±5)% r.h.

x-Direction (Horizontal: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	984 cd/(lx·m^2)	Min. 100 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	634 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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: ε=0°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	356 cd/(lx·m^2)	Min. 100 cd/(lx·m^2) (*)	Pass

y-Direction (Vertical: ε=90°)					
Material Type	Observation Angle α	Entrance Angle β1 (β2 = 0°)	Coefficient Of Retroreflection	Requirement	Pass/Fail
Retroreflective Material & Orientation Sensitive Material	12′	5°	254 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 Retroflection Of This Material At One Of The Two Rotation Angles Shall Comply With The Minimum Requirement, The Coefficient Of Retroflection 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.

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: +86 020-28209114 Postcode:510730
www.intertek.com

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	7.0	*

Temperature Of The Extracting Solution: 22.2℃
pH Of The Extracting Solution: 6.39

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

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

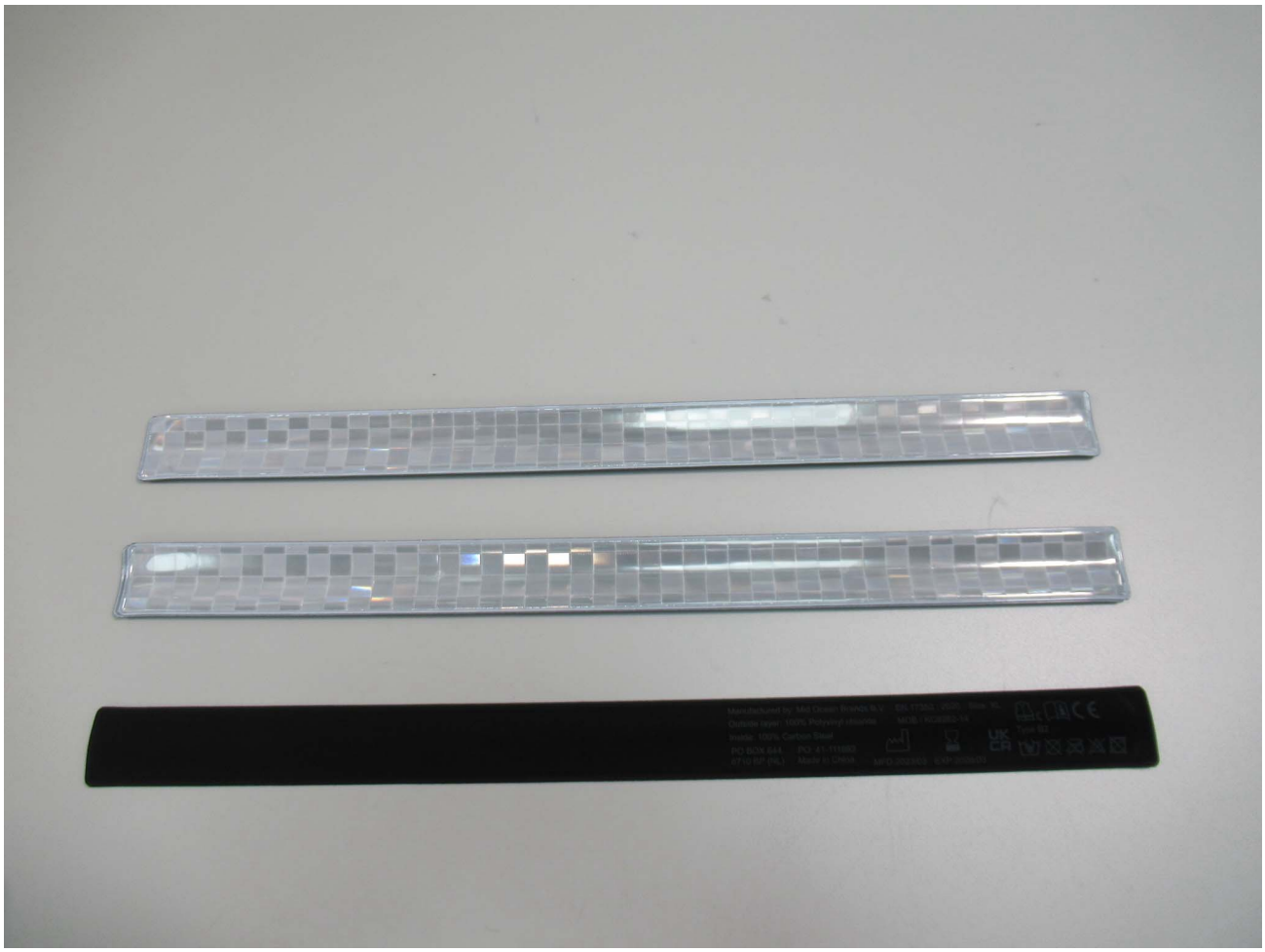
Remark: Requirement = 30 mg/kg
Reporting Limit = 5 mg/kg
Method T: Direct Buffer Extraction As Per ISO 14362-1:2017 Section 10.2
Method D: Colourant Extraction With Xylene As Per ISO 14362-1:2017 Section 10.1

Tested Component: Black Velvet Backing

Conclusion:

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

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: +86 020-28209114 Postcode:510730
www.intertek.com



End of Report

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: +86 020-28209114 Postcode:510730
www.intertek.com

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

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO

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

Examination of the Technical File Documentation, No: KC8282-08 Yellow, KC8282-14 Silver -reflective arm straps 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

UKCA TYPE EXAMINATION CERTIFICATE

intertek
Total Quality. Assured.

UKCA

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

UKAS PRODUCT CERTIFICATION
5320

Assessor: _____ Date: 24/08/2023

Certification Manager: J moore Date: 24/08/2023

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