



Certificate of Test

We hereby declare that the item described below has been tested by the Merchandise Testing Laboratories (U.K.) Ltd. And complies with the requirements of

EN471:1994 Clause 6.1 Retroreflective performance requirements of new separate performance material, Class 2 and Clause 6.2 Retroreflective performance requirements after exposure to abrasion, flexing, folding at cold temperatures, temperature variation, washing (25 cycles), and influence of rainfall

The full details of the tests and the results are given in our reports

TR2204/55557B

Dated: 18/06/03

Description of item tested:

Reflective Tape model No. 2220

Submitted by:

Shanghai Nitestar Industry Co., Ltd, Floor 23, Bldg # 2 Tian Shan Building,
789 Tian Shan Road, Shanghai, China.

Certificate authorised by:

J Moore

Title: Textile Technologist

Date: 18th June 2003



This declaration applies to the particular sample tested and to the specific tests carried out as dated and detailed in the report referenced above. It does not signify any measure of approval, certification, supervision, control or surveillance by M.T.L. (UK) Ltd to this or any related product.

Test Report

Report reference TR2204/55557B

Submitted by Shanghai Nitestar Industry Co., Ltd, Floor 23, Bldg # 2 Tian Shan Building,
789 Tian Shan Road, Shanghai, China.

Customer Reference

Date 26th May 2003

Sample Received 29th May 2003

Items tested Reflective Tape model No. 2220

Specifications **High visibility warning clothing** - BS EN 471: 1994
Photometric & physical performance requirements
for retroreflective material. - BS EN 471: 1994 clause 6.0

Test results As detailed in this report

Prepared by J.Moore(Miss)

Authorised by S.Welden

Date 18th June 2003

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Test Report

TR2204/55557B

Details of Sample: Reflective Tape model No. 2220

Date of Receipt: 29th May 2003

Date of Test: 16th June 2003

Test Specification: Photometric performance of retroreflective material - BS EN471:1994 clause 6.1

Deviations/Exclusions: None

Test Results: Retroreflective performance of new material.

The coefficient of reflection R' shall be determined in accordance with the procedure defined in CIE publication No. 54:1982. The measured focal length of photometer = 1016 mm.

When measured at the two rotation angles $E_1 = 0^\circ$ and $E_2 = 90^\circ$, the coefficient of retroreflection of this material did not differ by more than 15%. Therefore, this materials is defined as not orientation sensitive.

Coefficients of retroreflective luminous intensity R' cd/(lx . m ²)												
Angle of illumination												
Observation angle	5°			20°			30°			40°		
	result	spec. class 1 min.	spec. class 2 min.	result	spec. class 1 min.	spec. class 2 min.	result	spec. class 1 min.	spec. class 2 min.	result	spec. class 1 min.	spec. class 2 min.
12'	444	250	330	441	220	290	444	135	180	400	50	65
20'	307	120	250	297	100	200	283	75	170	298	30	60
1°	37.7	25	25	36.4	15	15	34.4	12	12	27.7	10	10
1° 30'	22.1	10	10	20.3	7	7	21.8	5	5	17.3	4	4

Compliance: This material **MEETS** the requirements of BS EN 471:1994 Clause 6 (Harmonised European Standard) for Minimum coefficient of retroreflection for separate performance material, Class 2.

Technologist: 
J. Moore(Miss)

S. Welden
Report Auditor



Test Report

TR2204/55557B

Details of Sample: Reflective Tape model No. 2220

Date of Receipt: 29th May 2003

Date of Test: 16th June 2003

Test Specification: Photometric performance of retroreflective material - BS EN471:1994 clause 6.2

Deviations/Exclusions: None

Test Results: Retroreflective performance after test exposure.

Exposure	Result cd/(lx . m ²)	spec. min
After abrasion	268	100
After flexing	401	100
After folding at cold temp.	432	100
After temperature variation	437	100
After washing (25 cycles)	413	100
Influence of rainfall	188	100

After Abrasion: BSEN 530:1991 Method 2 - 5000 rubs.

After Flexing: ISO 7854:1984 Method A - 7,500 cycles


After Folding at Cold Temperatures: ISO 4675:1990 (-20°C)

After Exposure to temperature variation: 12 hours @ 50±2°C, 20 hours @ -30±2°C. cond. >2 hrs.

After Washing: ISO 6330:1984 Method 2A; dried stress-free at 50 ± 5°C.- 25 cycles. Samples were prepared in accordance with BS EN471:1994 clause 7.4.5.1.

Compliance:

This material **MEETS** the requirements of BS EN 471:1994 (Harmonised European Standard) for Minimum coefficient of retroreflection for separate performance material after exposure to abrasion, flexing, folding at cold temperatures, temperature variation, washing (25 cycles) and influence of rainfall.

Technologist: 
J. Moore(Miss)

S. Welden
Report Auditor 

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