K-Lite(Shanghai) Industrial Co., Ltd

QUALITY TEST REPORT

Product Name:	Aluminum Road stud
Model :	KT-303(double side)
Applicant :	K-Lite(Shanghai) Industrial Co., Ltd Room101, No.3, Alley 88, Jinyu Road, Minhang District, Shanghai, P. R. China
Manufacturer :	K-Lite(Shanghai) Industrial Co., Ltd Room101, No.3, Alley 88, Jinyu Road, Minhang District, Shanghai, P. R. China
Report No.:	SCS1001071227
Test Standard:	EN1463-1：2009
Test Result:	**PASS**

Copy of marking plate: As reflected below or displayed in the attachment.

CE

K-Lite(Shanghai) Industrial Co., Ltd

Room101, No.3, Lane 88, Jinyu Road,
Minhang District, Shanghai, P. R. China
Chengdong New District, Economic Development Zone,
Yuyao City, Zhejiang Province, P. R. China

Road stud

10

P3A

SCS1001071227

EN1463-1: 2009

Mandated characteristics:
Retroreflectivity—Type 3
Retroreflector color—Red/White

Durability in use—R2

TEST REPORT DESCRIPTION

Applicant	:	K-Lite(Shanghai) Industrial Co., Ltd
Adress	:	Room101, No.3, Lane 88, Jinyu Road, Minhang District, Shanghai, P. R. China Chengdong New District, Economic Development Zone, Yuyao City, Zhejiang Province, P. R. China
EUT	:	Road stud
Model No.	:	KM-202(double side)

Measurement Procedure Used:

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Possible test case verdicts:

-test case does not apply to the test object : N/A
- test object does meet the requirement : P
- test object does not meet the requirement : F

General remarks:

"(see Attachment #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.
Throughout this report a point is used as the decimal separator.
The tests results presented in this report relate only to the object tested.
This report shall not be reproduced except in full without the written approval of the testing laboratory.
List of test equipment must be kept on file and available for review.

Prepared by : Kadeem Wang / Assistant

Reviewer : Mary Du / Supervisor

Approved & Authorized Signer : Cabin / Manager

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Clause	***Requirement – Test***	***Result - Remark***	***Verdict***
4	Types of road stud		P
	Road studs are classified in this European Standard in accordance with Tables 1, 2 and 3.		P
	Table 1 - Classification of road studs by use Use / Type Permanent road stud / P Temporary road stud / T	Permanent road stud, type P	P
	Table 2 - Classification of road studs by reflector Reflector / Type Glass / 1 Plastic / 2 Plastic with abrasion resistant layer / 3	Plastic with abrasion resistant layer , type 3	P
	Table 3 - Classification of road studs by design Design / Type Non depressible road stud / A Depressible road stud / B	Non depressible road stud, A	P
5	Performance requirements		P
5.1	Construction		P
	For safety reasons the enveloping profile of the road studs shall not present any sharp edges to traffic.	No sharp edges	P
5.2	Dimensions		P
	The height of that part of a road stud designed to be above the road surface shall be as follows: - class H 0 - no performance determined; - class H 1 - up to 18 mm; - class H 2 - from more than 18 mm to 20 mm; - class H 3 - from more than 20 mm to 25 mm.	White: Class H1, 18.0mm Red: Class H2, 18.5mm	P
	Maximum horizontal dimensions of that part of a road stud which is exposed to traffic after installation are classified as follows: - class HD 0 - no performance determined; - class HD 1 - in the direction of travel: length 250 mm, width 190 mm; - class HD 2 - in the direction of travel: length 320 mm, width 230 mm.	White:Class HD1 Length: 102.5mm Width: 102.0mm Red:Class HD1 Length:102.5mm Width:102.0mm	P

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Clause	*Requirement – Test*	*Result - Remark*	*Verdict*
	Minimum horizontal dimensions of that part of a temporary road stud which is exposed to traffic after installation are classified as follows: - class HDT 0 - no performance determined; -class HDT1 - in the direction of travel: length 35 mm, width 84 mm; -class HDT2- in the direction of travel: length 75 mm, width 90 mm.	Permanent road stud	N
5.3	Night-time visibility		P
5.3.1	Photometric requirements		P
5.3.1.1	Permanent road stud		P
	When tested in accordance with Annex A, each retroreflective face of the road stud shall have a coefficient of luminous intensity (R) as classified (see Table 4) multiplied by the appropriate colour factor given in Table 5. -class PRP 0 - no performance determined; - class PRP 1- not less than given in Table 4.	Class PRP 1, Red/White	P
5.3.1.2	Temporary road studs		N
	When tested in accordance with Annex A, each retroreflective face of the road stud shall have a coefficient of luminous intensity (R) as classified (see Tables 6 to 8) multiplied by the appropriate colour factor given in Table 5: - class PRT 0 - no performance determined; - class PRT 1 - not less than Table 6; - class PRT 2 - not less than Table 7; - class PRT 3 - not less than Table 8.	Permanent road stud	N
5.3.1.3	Interpretation of the results		P
	A road stud shall not be considered to fail the photometric requirements if the measured coefficient of luminous intensity at any one position of measurement is less than the values specified in Tables 4 or 6 to 8, multiplied by the respective colour factor given in Table 5 provided that: a) the value is not less than 80 % of the specified minimum; and b) the average of the left (-) and right (+) measurements for the specific angle is greater	These requirements have been complied with.	P

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	than the specified minimum.		
5.3.2	Colorimetric requirements		P
	When tested in accordance with Annex B, the retroreflected radiation of a road stud shall be classified as follows and have chromaticity co-ordinates that lie within the permitted regions defined in Table 9. - class NCR 0 - no performance determined; - class NCR 1 - as specified in Table 9.	White&Red:Class CNR1, X: 0.455 Y: 0.409	P
5.4	Daytime visibility of temporary road studs		N
	When tested in accordance with Annex C and using the measuring geometry 45/0 the road stud body shall have chromaticity coordinates that lie within the permitted regions defined in Table 10 and shall have the minimum luminance factor given in Table 10. Daytime visibility is classified as follows: - class DCR 0 - no performance determined; - class DCR 1 - as specified in Table 10.	Permanent road stud	N
5.5	Resilience of depressible road studs		N
	When tested in accordance with Annex D depressible road studs shall show no breakdown of the depressing action and no permanent deformation of such an extent that the retroreflecting part is permanently obscured, even partially.		N
6.	Road stud fixing		P
	All road studs shall be laid in accordance with the manufacturer's instructions. Removal of temporary road studs shall be possible without damage to the road surface and with a minimum of residue.	The manufacturer's instructions have been provided laid method.	P
7	Marking		P
	All road studs shall be clearly and permanently marked. The following information shall be on the road stud or the packaging or the accompanying commercial documents using a hierarchical method in that order: a) name or identifying mark of the manufacturer; b) the road stud type and performance classes as identified in	The informaiton has been provided in the road stud and the packaging and the accompanying commercial documents	P

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	Clauses 4 and 5 of this standard and Clause 6 of EN 1463-2:2000.		
	The environmental parameter classes for test modules are listed in Table 7.		N
	Minimum information on the product: c) the name or identifying mark of the manufacturer	The information has been provided in the nameplate.	P
	On the packaging: d) all information given on the product, plus e) the road stud type and performance classes as identified in Clauses 4 and 5 of this standard and Clause 6 of EN 1463-2:2000.	The information has been provided in the packaging	P
	On the accompanying commercial documents: f) none, if all information has already been supplied on the product and packaging; g) any information which has not already been given on the product or packaging plus all the information given on the product and packaging.		N

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Table 4 - Class PRP 1 - Minimum R values for type 1, type 2 and type 3 road studs as new

Entrance angle β_H $\beta_V = 0°$	Observation angle α	Min. R mcd · lx^{-1}		
		Type		
		1	2	3
± 15°	2°	2	2,5	1,5
± 10°	1°	10	25	10
± 5°	0,3 °	20	220	150

Table 5 - Colour factors for the retroreflectors of road studs

Colour	Colour factor
White	1,0
Yellow	0,6
Amber	0,5
Red	0,2
Green	0,2

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Table 9 - Corner points of chromaticity regions for retroreflected radiation of permanent and temporary road studs as new - class CNR1

Colour	Point	x	y
White (uncoloured)	1	0,390	0,410
	2	0,440	0,440
	3	0,500	0,440
	4	0,500	0,390
	5	0,420	0,370
Yellow	1	0,539	0,460
	2	0,530	0,460
	3	0,580	0,410
	4	0,589	0,410
Amber	1	0,549	0,450
	2	0,543	0,450
	3	0,590	0,395
	4	0,605	0,395
Red	1	0,665	0,335
	2	0,645	0,335
	3	0,721	0,259
	4	0,735	0,265
Green	1	0,030	0,385
	2	0,228	0,351
	3	0,321	0,493
	4	0,302	0,692

NOTE 1 If two of the points lie on the spectrum locus line, they shall not be connected by a straight line but shall, in this case, be joined by the boundary of the spectrum locus.

NOTE 2 The night-time colours of retroreflective materials are at present being studied by the International Commission on Illumination (CIE TC 2.19). The limits given in this table are therefore of a provisional nature. It is proposed that these will be revised once TC 2.19 has completed its work.

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Table 10 - Corner points of chromaticity regions and minimum luminance factor for temporary road stud bodies as new - class DCR 1

Colour	Point	x	y	Luminance factor β
White	1	0,350	0,360	≥ 0,75
	2	0,300	0,310	
	3	0,290	0,320	
	4	0,340	0,370	
Fluorescent green-yellow	1	0,380	0,620	≥ 0,75
	2	0,320	0,540	
	3	0,380	0,480	
	4	0,460	0,540	
Yellow	1	0,522	0,477	≥ 0,45
	2	0,470	0,440	
	3	0,427	0,483	
	4	0,465	0,534	

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EUT PHOTOGRAPH

Fig .1

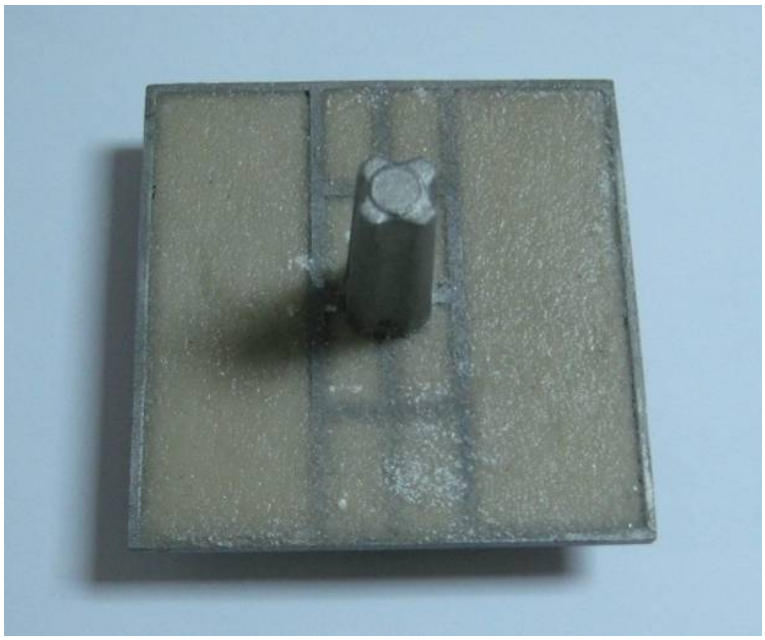

Fig .2

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Clause	*Requirement – Test*	*Result - Remark*	*Verdict*

Fig .3

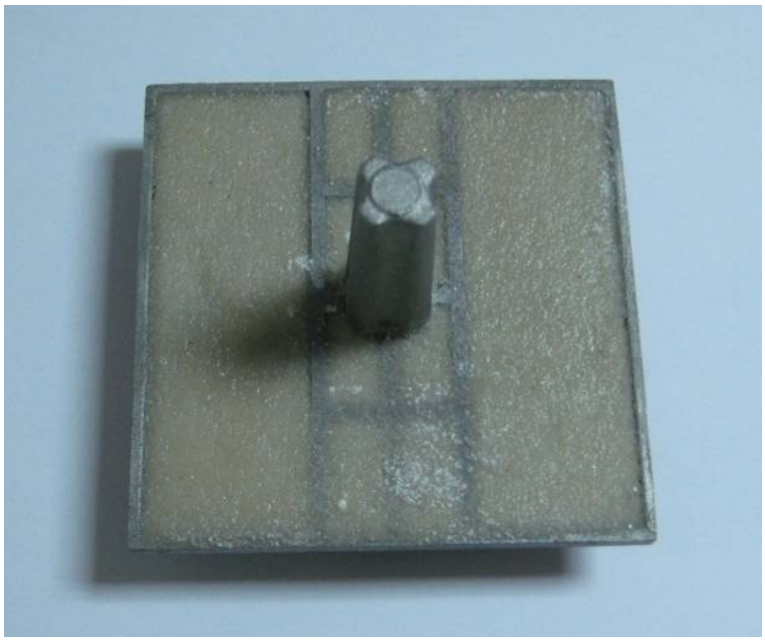

Fig .4