

ECE TYPE-APPROVAL CERTIFICATE



Communication concerning:²

Approval granted
~~Approval extended~~
~~Approval refused~~
~~Approval withdrawn~~
 Production definitely discontinued

of a type of headlamp pursuant to Regulation No. 112

Approval No: **E24*112R01/07*0284*00**

Reason for extension:

N/A

1. Trade name or mark of the device:



2. Manufacturer's name for the type of device:

ZK-01-001

3. Manufacturer's name and address:

Changzhou Zhongkai Vehicle Parts Co., Ltd.
Menghe Avenue, Henghe Town, Xinbei District, Changzhou City, Jiangsu Province
P.C.: 213001

4. If applicable, name and address of manufacturer's representative:

N/A

5. Submitted for approval on:

09.01.2018

6. Technical service responsible for conducting approval tests:

TÜV SÜD Auto Service GmbH
Westendstraße 199
D-80686 München
Germany

7. Date of test report issued by that service:

03.01.2018

8. Number of report issued by that service:

17-01914-CX-SHA-00

¹ Distinguishing number of the country which has granted/refused/withdrawn approval (see the provisions of the Regulation concerning approval).

² Strike out which does not apply.

Approval No: **E24*112R01/07*0284*00**

9. Brief description

Category as described by the relevant marking³:

HCR PL

Number and category(s) of filament lamp(s):

***1*H1 for passing beam
1*H1 driving beam***

Reference luminous flux used for the principal passing beam (lm):

1550 lm

Principal passing beam operated at approximately (V):

13.899V

Measures according to paragraph 5.8 of this Regulation:

(b), the passing beam headlamp fulfils the requirements of the paragraph 5.8.2. of the regulation with downward movement 0.5° of the beam

Number and specific identification code(s) of LED module(s) and for each LED module a statement of whether it is replaceable or not: ~~yes~~/no²

No

Number and specific identification code(s) of electronic light source control gear(s):

N/A

Total objective luminous flux as described in paragraph 5.9 exceeds 2000 lumens: ~~yes~~/~~no~~/does not apply²

Does not apply

The adjustment of the cut-off⁷ has been determined at: ~~10 m~~/25 m/~~does not apply~~²


25 m

The determination of the minimum sharpness of “cut-off” has been carried out at: ~~10 m~~/~~25 m~~/~~does not apply~~²

Does not apply

Approval No: E24*112R01/07*0284*00

- | | | |
|-----|--|--------------------------------------|
| 10. | Approval mark position: | <i>On the lens</i> |
| 11. | Reason(s) for extension of approval: | <i>N/A</i> |
| 12. | Approval granted/ extended / refused / withdrawn ² | <i>Granted</i> |
| 13. | Place: | <i>Dublin</i> |
| 14. | Date: | <i>25th January, 2018</i> |

15. Signature: 



16. The list of documents deposited with the Administrative Service which has granted approval, is annexed and may be obtained on request.

³ Indicate the appropriate marking selected from the list below:

- C, C, C, R, R PL, CR, CR, CR, C/R, C/R, C/R, C/, C/, C/,
 → ↔ → ↔ → ↔ → ↔ → ↔ → ↔ → ↔
 C, PL, C PL, C PL, CR PL, CR PL, CR PL, C/R PL, C/R PL, C/R PL,
 → ↔ → ↔ → ↔ → ↔ → ↔ → ↔
 C/PL, C/PL, C/PL
 → ↔ → ↔
 HC, HC, HC, HR, HR PL, HCR, HCR, HCR, HC/R, HC/R, HC/R, HC/, HC/, HC/,
 → ↔ → ↔ → ↔ → ↔ → ↔ → ↔ → ↔ → ↔
 HC PL, HC PL, HC PL, HCR PL, HCR PL, HCR PL, HC/R PL, HC/R PL, HC/R PL,
 → ↔ → ↔ → ↔ → ↔ → ↔ → ↔
 HC/PL, HC/PL, HC/PL
 → ↔ → ↔

Index to the Information Package

Date of issue:	<i>25th January, 2018</i>
Date of latest amendment:	<i>N/A</i>
Reason for extension/revision:	<i>N/A</i>
1. Additional conditions, and advisory notes on legal alternatives.	
2. Test report(s)	
- numbers(s):	<i>17-01914-CX-SHA-00</i>
- date of issue:	<i>03.01.2018</i>
- date of latest amendment:	<i>N/A</i>
3. Information document	
- number(s):	<i>ZK-01-001-00</i>
- date of issue:	<i>14.12.2017</i>
- date of latest amendment:	<i>N/A</i>
Documentation:	<i>23 pages</i>



Approval No: E24*112R01/07*0284*00

Appendix: **Additional conditions, and advisory notes on legal alternatives.**

A: Additional conditions:

1. The device, Type ZK-01-001, shall be marked as prescribed in the regulation.
2. The attached technical report, with any of its attachments, forms part of this Type Approval certificate.
3. Each individual product from series production shall be to the measurements specified in the attached drawings, and shall be manufactured only from the materials specified in the Approval documents.
4. Changes in the product are permitted only with the explicit permission of NSAI. Breaches of this requirement will lead to a withdrawal of the Type Approval, and in addition may be subject to criminal prosecution.
5. This Type Approval will expire when it is surrendered by the holder, or withdrawn by NSAI, or when the approved type of product no longer conforms to legal requirements. The recall of the Type Approval can be issued by NSAI when the conditions required for the issuing or continuation of the Type Approval are no longer current, or when the Approval holder is in breach of the duties attached to the Type Approval, or when it is established that the approved type no longer meets the requirements of traffic safety.
6. NSAI may at any time check the correct performance of the duties imposed by the grant of this Type Approval, and in order to do so, may make tests, or have tests made.
7. Changes in the company name, address or manufacturing site, as well as in any of the sales or other agents specified in the issuing of the approval must immediately be notified to the NSAI.
8. The duties imposed by the issuing of this certificate are not transferable. The legal protection of third parties is not affected by this certificate.
9. When the manufacture or sale of the vehicle, system, component or separate technical unit has not been started within one year of the date of issue of this certificate, then NSAI is to be informed. This requirement also applies when the manufacture or sale has been halted for more than one year, or when it ought to have been halted for more than one year. The initial commencement of manufacture or sale, or the resumption of manufacture or sale, shall then be notified to NSAI within one month of commencement or resumption.

B : Legal Options

Any objection to the requirements set out in this certificate shall be made within one month of the date of issue. The objection shall be made, in writing, to NSAI in Dublin.



Technical Report No.: 17-01914-CX-SHA-00
Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
Type: ZK-01-001

TECHNICAL REPORT

No.: 17-01914-CX-SHA-00

Test according to ECE regulation relating to

ECE Regulation No.: 112

Headlamps emitting an asymmetrical passing beam or a driving beam
(Equipped with Filament Lamps)


including all amendments up to
supplement 07 to the 01 series of amendments

Approvals granted up to now		
ECE	Number of approval	Date
	---	---

Technical Report No.: 17-01914-CX-SHA-00
Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
Type: ZK-01-001

Page 2 / 9

I. Technical description

- 0.1. Make (trade name of manufacturer) : 
- 0.2. Type : ZK-01-001
- 0.2.1. Variants : N/A
- 0.3. Means of identification of type : By digits and letters
- 0.4. Concise description
- Category as described by the relevant marking : HCR PL
- Number and category(ies) of filament lamp(s) : 1*H1 for passing beam and 1*H1 driving beam
- Reference luminous flux used for the principal passing beam (lm) : 1550
- Principal passing beam operated at approximately (V) : 13.899
- Measures according to paragraph 5.8 of this Regulation : (b), the passing beam headlamp fulfils the requirements of the paragraph 5.8.2. of the regulation with downward movement 0.5° of the beam
- Number and specific identification code(s) of LED module(s) and for each LED module a statement whether it is replaceable or not : No
- Number and specific identification code(s) of electronic light source control gear(s) : N/A
- Total objective luminous flux as described in paragraph 5.9. exceeds 2,000 lumens : N/A
- The adjustment of the cut-off has been determined at : 25m

Technical Report No.: 17-01914-CX-SHA-00
Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
Type: ZK-01-001

Page 3 / 9

The determination of the minimum sharpness of the 'cut-off' has been carried out at : N/A

0.5. Name and address of manufacturer : Changzhou Zhongkai Vehicle Parts Co., Ltd.
Menghe Avenue, Henghe Town, Xinbei District, Changzhou City, Jiangsu Province
P.C.: 213001

0.6. Address of assembly plant : See 0.5.

0.7. Location of the approval mark : On the lens

0.8. If applicable, name and address of the manufacturer's representative : N/A

II. Test record

1. Test conditions

1.1. Technical data of the test samples : Two samples were tested.
Sample No. 1, left side mounting.
Sample No. 2, right side mounting.
For information about the form of the lamp, the position of the reference point and the reference axis, see information document.

1.2. Test procedures used : According to ECE Regulation No. 112.01.

1.3. Measuring and test equipment : Full automatic photometric test system for automobile lamps
EVERFINE PHOTO-E-INFO CO.,LTD
Type GO-HD5

2. Test results

2.1. General Specifications

The headlamps have been made as to retain their prescribed photometric characteristics and to remain in good working order when in normal use, in spite of the vibrations to which they may be subjected.

Headlamps have been give adequate illumination without dazzle when emitting the passing-beam, and good illumination when emitting the driving-beam.

No light source module or light generator is used.

2.2. Test record of the photometric measurements of the passing beam, Class B, sample No. 1 and No. 2, test voltage 13.899V.

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	HV	---	625.00	490.15	503.22	Complies
2	B50L	---	350.00	198.54	202.85	Complies
3	BR	---	1750.00	257.10	269.94	Complies
4	75R	10100.00	---	15287.83	15145.54	Complies
5	75L	---	10600.00	4796.58	4643.47	Complies
6	50L	---	13200.00	5211.26	5129.27	Complies
7	50V	5100.00	---	13805.34	14277.56	Complies
8	25L	1700.00	---	4299.53	4158.34	Complies
9	25R	1700.00	---	5500.15	5376.15	Complies
10	Z III	---	625.00	525.62	521.43	Complies
11	ZA 1	---	625.00	132.71	145.91	Complies
12	ZA 2	---	625.00	134.98	156.46	Complies
13	ZA 3	---	625.00	108.35	106.59	Complies
14	ZA 1+ZA 2+ZA 3	190.00	---	376.04	408.96	Complies
15	ZB 4	---	625.00	264.27	240.44	Complies
16	ZB 5	---	625.00	201.64	211.05	Complies
17	ZB 6	---	625.00	188.43	181.40	Complies
18	ZB 4+ZB 5+ZB 6	375.00	---	654.34	632.89	Complies
19	ZA 7	65.00	---	173.74	182.11	Complies
20	ZB 8	125.00	625.00	189.95	190.24	Complies
21	Z IV MIN.	2500.00	---	4446.92	4610.84	Complies
22	50R	10100.00	---	18398.92	19881.30	Complies
23	Z I MAX.	---	2*I _{50R}	19009.48	20914.05	Complies

* In case where a headlamp in which LED modules are producing a passing beam in conjunction with an electronic light source control gear, the measured value shall not be more than 18500 cd.

Technical Report No.: 17-01914-CX-SHA-00
Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
Type: ZK-01-001

Page 5 / 9

2.3. Test record of the photometric measurements of the driving beam, sample No. 1 and No. 2, test voltage 13.899V.

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	lmax.	40500.00	215000.00	46239.83	45582.93	Complies
2	HV	0.8lmax.	---	45714.28	44118.93	Complies
3	H-5L	5100.00	---	15770.25	15165.39	Complies
4	H-2.5L	20300.00	---	23847.38	23798.75	Complies
5	H-2.5R	20300.00	---	22779.29	24480.95	Complies
6	H-5R	5100.00	---	14677.73	15872.61	Complies

Reference Mark (lmax / 4300): 10 *Average of the value for Sample No. 1 and Sample No. 2.

2.4. Test record of different traffic condition, sample No. 1 and No. 2, test voltage 13.899V.

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	1.72L 0.86D	2500.00	---	3257.72	4464.64	Complies
2	3.43R 0.57U	---	880.00	598.89	637.61	Complies

2.5. Test record of the photometric measurement in different positions, sample No. 1 and No. 2, test voltage 13.899V.

2.5.1. Passing beam (+2°)

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	B50L	---	350.00	202.28	212.01	Complies
2	75R	10100.00	---	15376.84	15402.84	Complies

2.5.2. Passing beam (-2°)

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	B50L	---	350.00	213.98	218.87	Complies
2	75R	10100.00	---	15589.98	15718.25	Complies

2.5.3. Driving beam (+2°)

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	lmax.	40500.00	215000.00	45372.93	44637.39	Complies
2	HV	0.8lmax.	---	44428.88	42774.54	Complies

2.5.4. Driving beam (-2°)

No.	Point of the measurement	Limits [cd]		Measured values [cd]		Conclusion
		Minimum	Maximum	Sample No. 1	Sample No. 2	
1	I _{max.}	40500.00	215000.00	45729.82	45073.10	Complies
2	HV	0.8I _{max.}	---	45018.84	43389.84	Complies

2.6. Stability of photometric performance of headlamp in operation.

2.6.1. Clean headlamp – Sample No. 1.

No.	Point of the measurement	Measured values			Conclusion
		Value before operating (cd)	Value after operating (cd)	Discrepancy (≤ 10%)	
1	Passing beam: HV	490.15	506.85	3.41%	Complies
2	Passing beam: B50L*	198.54	208.98	10.44cd	Complies
3	Passing beam: 25L	4299.53	4089.98	0.22%	Complies
4	Passing beam: 50R	18398.92	18137.93	1.42%	Complies

2.6.2. Dirty headlamp – Sample No. 1.

No.	Point of the measurement	Measured values			Conclusion
		Value before operating (cd)	Value after operating (cd)	Discrepancy (≤ 10%)	
1	Passing beam: HV	506.85	512.93	1.20%	Complies
2	Passing beam: B50L*	208.98	216.25	7.27cd	Complies
3	Passing beam: 25L	4089.98	3923.40	4.07%	Complies
4	Passing beam: 50L	18137.93	17937.93	1.10%	Complies

*The value measured at Point B50L shall not exceed the photometric value measured prior to the test by more than 170cd.

2.6.3. Clean headlamp – Sample No. 1.

No.	Point of the measurement	Measured values			Conclusion
		Value before operating (cd)	Value after operating (cd)	Discrepancy (≤ 10%)	
1	Driving beam: I _{max.}	46239.83	45788.93	0.98%	Complies

2.6.4. Dirty headlamp – Sample No. 1.

No.	Point of the measurement	Measured values			Conclusion
		Value before operating (cd)	Value after operating (cd)	Discrepancy (≤ 10%)	
1	Driving beam: I _{max.}	45788.93	45422.82	0.80%	Complies

2.6.5. Test record of cut-off line under the influence of heat – Sample No. 1.
 - Change: 0.69 mrad < 2 mrad (limit)

* The result complies with the requirements prescribed in paragraph 1.1.2. of Annex 4 in this Regulation.

2.7. Tests on plastic lens

2.7.1. Test report for plastic material of the lens attached to the manufacturer's information document.

2.7.2. Tests of the complete headlamp incorporating a lens of plastic material.

2.7.2.1. Test of adherence of coatings - Sample No. 1.
 - No appreciable impairment of the gridded area – Complies.

2.7.2.2. Resistance to mechanical deterioration of the lens surface - Sample No. 2.

No.	Point of the measurement	Limits [cd]		Measured values [cd]	Conclusion
		Minimum	Maximum		
1	HV	---	812.50	536.94	Complies
2	B50L	---	455.00	227.94	Complies
3	75R	9090.00	---	15674.54	Complies

* The result complies with the requirements prescribed in paragraph 2.6.1.2. of Annex 6 in this Regulation.

2.8. Test record of the colour

2.8.1. Passing beam - White

Sample	Measured values		Limits
	x	y	
			W12 green boundary: $y = 0.150 + 0.640 x$ W23 yellowish green boundary: $y = 0.440$ W34 yellow boundary: $x = 0.500$ W45 reddish purple boundary: $y = 0.382$ W56 purple boundary: $y = 0.050 + 0.750 x$ W61 blue boundary: $x = 0.310$
No. 1	0.4319	0.4026	Complies
No. 2	0.4325	0.4030	Complies

2.8.2. Driving beam - White

Sample	Measured values		Limits
	x	y	
			W12 green boundary: $y = 0.150 + 0.640 x$ W23 yellowish green boundary: $y = 0.440$ W34 yellow boundary: $x = 0.500$ W45 reddish purple boundary: $y = 0.382$ W56 purple boundary: $y = 0.050 + 0.750 x$ W61 blue boundary: $x = 0.310$
No. 1	0.4283	0.4012	Complies
No. 2	0.4288	0.4019	Complies

Technical Report No.: 17-01914-CX-SHA-00
Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
Type: ZK-01-001

Page 8 / 9

2.9. Apparent surface

2.9.1. Passing beam

Limit (I)	Limit (O)	Limit (U)	Limit (D)
30mm	30mm	30mm	30mm

2.9.2. Driving beam

Limit (I)	Limit (O)	Limit (U)	Limit (D)
48mm	48mm	48mm	48mm

3. Specimen submitted to test on : 2017-12-14 (YYYY-MM-DD)

4. Place of test : Jiangsu Huachen Vehicle Inspection Co., Ltd., Zhenjiang City, P.R. China

Date of test : 2017-12-19 to 2017-12-20
: (YYYY-MM-DD)

III. Enclosures

Manufacturer's information document No. : ZK-01-001-00

Dated on : 2017-12-14 (YYYY-MM-DD)



Technical Report No.: 17-01914-CX-SHA-00
 Manufacturer: Changzhou Zhongkai Vehicle Parts Co., Ltd.
 Type: ZK-01-001

IV. Statement of conformity

The information folder as mentioned under No. III and the type described therein are in compliance with the test specification mentioned above. The worst-case was selected in accordance with document "Preparation of Test Reports".

The test report may be reproduced and published in full and by the client only. It can be reproduced partially with the written permission of the test laboratory only.

München, 2018-01-03
 (YYYY-MM-DD)



Joe Zhou


Test Laboratory / DIN EN ISO 17025

Genehmigungsbehörde/ Approval authority	Land/Country	Registriernummer/ Registration-number	Aktueller Benennungsumfang/ Actual scope list
Kraftfahrt-Bundesamt (KBA)	Deutschland/ Germany	KBA-P 00100-10	www.kba.de
Vehicle Certification Agency (VCA)	Vereintes Königreich/ United Kingdom	VCA-TS-006	http://ec.europa.eu/enterprise/sectors/automotive/approval-authorities-technical-services/technical-services/index_en.htm
Approval Authority of the Netherlands (RDW)	Niederlande/ The Netherlands	RDWT-082-XX	
National Standards Authority of Ireland (NSAI)	Irland/ Ireland	Technical Service Number: 49	
Vehicle Safety Certification Center (VSCC)	Taiwan/ Taiwan	DE04-06-2	http://www.vsc.org.tw/English/Default.aspx

Information folder No. : ZK-01-001-00

First application date : December 14, 2017

1. Specification data

Type		ZK-01-001			
Function		Front group lamp			
		Head lamp		Front position lamp	Front direction indicator lamp
		Passing beam	Driving beam		
Color		White	White	White	Amber
Rated	Voltage	24V	24V	24V	24V
	Wattage	70W	70W	10W	21W
Application Regulation ECE		R112.01 Class B PL RHT		R7.02 A	R6.01 Cat. 1a
Location of marking	Number and category of light source	H1	H1	R10W	PY21W
	Trade mark	Marked on housing			
					
	Approval mark	Marked on lens			
Remark		The lamp is only for use on a vehicle fitted with a tell-tale indicating failure: No			
		Sequential activation of light sources: No			

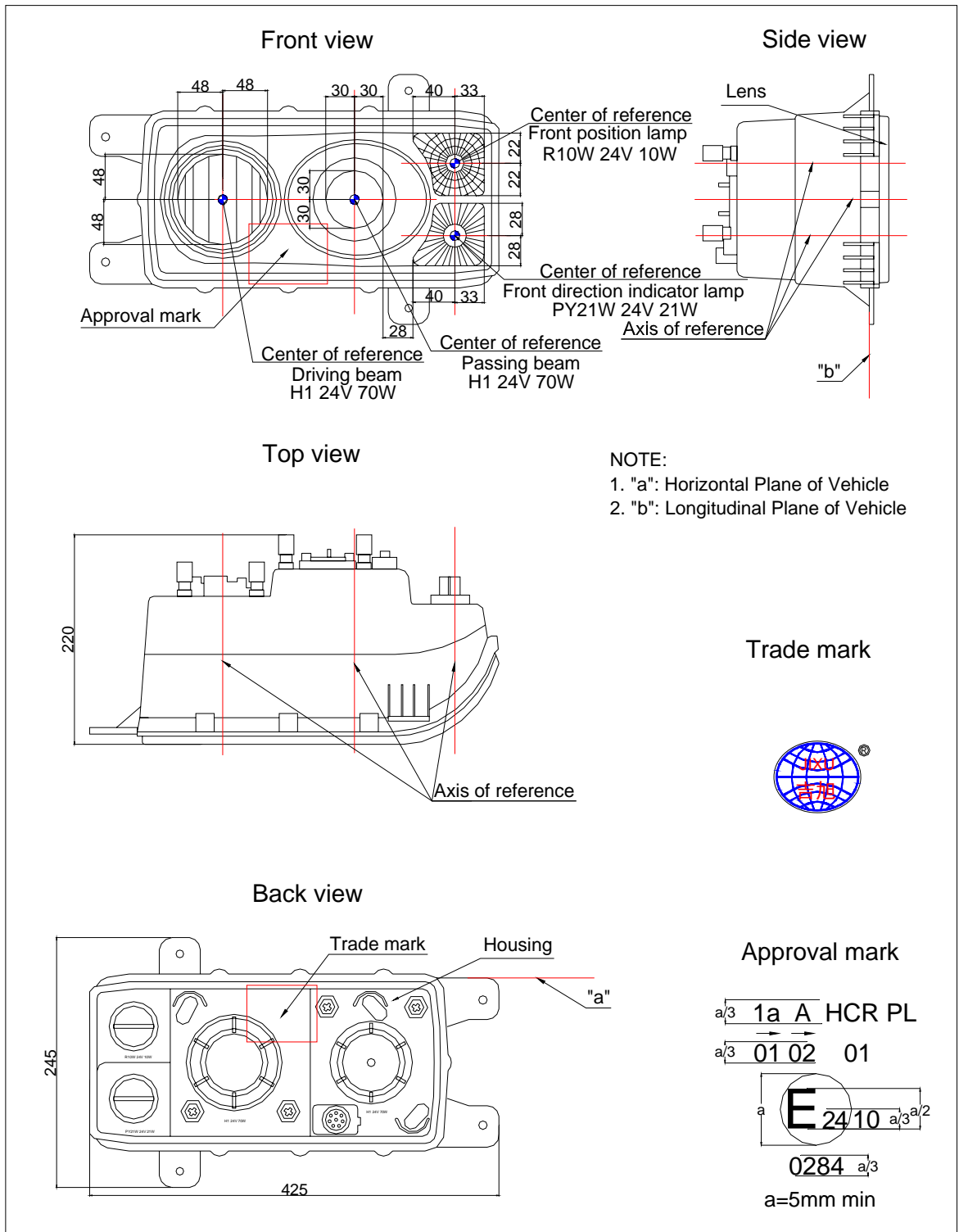
2. Construction and material

Construction		Material	Remarks
Outer lens		PC	Make: Bayer AG Type: Makrolon, AL 2647- hue 55/396 Coating and Coating System: Make: Red Spot Paint & Vamish Co. Inc. Evansville, Ind. USA Type: UVT 200 Q1
Inner lens	P.B.	Glass	Colour: Clear
Reflector	P.B.	BMC	AL vacuum vapour coating Painting on the inside surface Colour: Metal silver
	D.B.	BMC	
	F.P.L.	PC	
	F.D.L.	PC	
Housing		PP	Colour: Black
Electrical Wiring		Copper covered with insulation	--

3. Name and address of manufacturer : Changzhou Zhongkai Vehicle Parts Co., Ltd.
Menghe Avenue, Henghe Town, Xinbei District,
Changzhou City, Jiangsu Province P.C.: 213001

4. Name and address of the assembly plant : See 3.

5. Name and address of the manufacturer's representative : N/A



Product Type	ZK-01-001
General assembly drawing (Left side)	
Drawing No.	ZK-01-001-01

L i c h t t e c h n i s c h e s I n s t i t u t
U n i v e r s i t ä t K a r l s r u h e
L T I K

Report No. PMT 046

Prüfstelle für lichttechnische Einrichtungen an Fahrzeugen

L i c h t t e c h n i s c h e s I n s t i t u t
U n i v e r s i t ä t K a r l s r u h e
L T I K

Prüfstelle für lichttechnische
Einrichtungen an Fahrzeugen

76128 Karlsruhe
Kaiserstraße 12
Telefon 0721 608 2551
Telefax 0721 66 19 01

Report

about tests fixed in several
ECE-Regulations for headlamps

Number of the report : PMT 046
Date of the report : March, 17. 1994
Subject : Test of coated plastic materials to be
used for lenses of headlamps
Applicant : Bayer AG, 51368 Leverkusen

Description of the materials declared by the applicant

Basis-material	Makrolon, AL 2647-hue 55/396
Typ	
Kind of material	Bayer AG, 51368 Leverkusen
Manufacturer	
Coating	UVT 200 Q1
Type	
Kind of material	
Manufacturer	Red Spot Paint & Varnish Co. Inc Evansville, Ind. USA

For the tests of the described materials to be used for lenses of headlamps for vehicles relating to the application the requirements were based on the relevant annex in the ECE-Regulations No. 1, 5, 8, 19, 20, 31, 57 and 72.

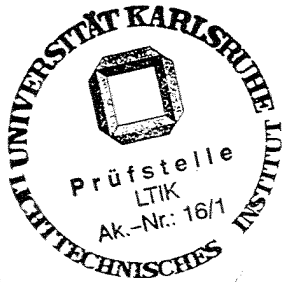
REQUIREMENTS FOR LAMPS INCORPORATING LENSES OF PLASTIC MATERIAL
- TESTING OF LENS OR MATERIAL SAMPLES AND OF COMPLETE LAMPS
(Technical annex)

(former document TRANS/SC1/WP29/306)

The devices necessary for the tests on flat samples were presented. The results of the tests are described in enclosures.

The requirements in accordance with the before-mentioned document are fulfilled.

This report consists of 8 pages.



Dr. Karl Manz

(Dr. K. Manz)

Tests

General: The mentioned paragraphs refer to the relevant annex in the ECE-Regulations No. 1, 5, 8, 19, 20, 31, 57 and 72:

REQUIREMENTS FOR LAMPS INCORPORATING LENSES OF PLASTIC MATERIAL
- TESTING OF LENS OR MATERIAL SAMPLES AND OF COMPLETE LAMPS
(Technical annex)

(former document TRANS/SC1/WP29/306)

Resistance to temperature changes

Three new lenses were subjected to the cycles of temperature changes referred to in 2.1.1.

Before and after this cycles the lenses were positioned to a headlamp *) provided for this test and tested photometrically in the measuring points required in 2.1.2.1.

The changes of the photometric values caused by the heat-test are summarized in the following table

Measuring point	Change of the photometric values by the heat test according to 2.1.1. in %			permissible change
	Sample 1	Sample 2	Sample 3	
Dipped beam B 50 L	2,5	5,7	2,5	10 %
50 R	3,4	1,5	0,8	
Highbeam E max	2,5	2,3	1,7	10 %

The permissible limits are not exceeded.

*) Test-headlamps type similar Hella 1A8.099

Resistance to atmospheric agents

Three new samples of material were subjected to the weathering- test referred to in 2.2.1.

After that no damages could be perceived at the samples, the values of transmission, as certified by the procedure corresponding to Annex 2 are summarized in the following table.

Measuring point	Sample		
	1	2	3
T2	88,4	88,4	88,3
T3	88,3	88,6	85,5
Δt	0,001	0	0
mean value Δt	0		
Δt_{\max}	0,020		

The permissible limits are not exceeded.

Resistance to chemical agents

At the samples of material referred before after the weathering-test according to 2.2.1 and the measurement according to 2.2.3.1 the procedures according to 2.2.2.2 and 2.2.2 were realized.

After a suitable drying time no damages could be perceived at the samples, the values of diffusion ascertained by the procedure corresponding to Annex 2 are summarized in the following table:

Measuring point	Sample		
	1	2	3
T2	88,4	88,4	88,3
T4	0,1	0,2	0,2
T5	1,0	0,6	0,7
Δd	0,010	0,005	0,006
Mean value Δd	0,007		
Δd_{\max}	0,020		

The permissible limits are not exceeded.

Resistance to detergents and hydrocarbons

Three new samples of material were subjected successively to the procedure described in 2.3.1 and 2.3.2.

The values of transmission ascertained by the procedure corresponding to Annex 2 are summarized in the following table.

Measuring point	Sample		
	1	2	3
T2	88,4	88,5	88,4
T3	88,3	88,4	88,3
Δt	0,001	0,001	0,001
mean value Δt	0,001		
Δt_{\max}	0,010		

The permissible limits are not exceeded.

Resistance to mechanical deterioration

Three new samples of material were subjected to the test of checking the resistance to mechanical deterioration according to Annex 3.

The values of transmission and diffusion ascertained by the procedure corresponding to Annex 2 are summarized in the following table.

Measuring point	Sample		
	1	2	3
T2	88,2	88,3	88,1
T3	87,6	87,7	87,6
T4	0,2	0,3	0,3
T5	0,7	0,8	0,8
Δt	0,007	0,007	0,006
Δd	0,006	0,006	0,006
Mean value Δt	0,007		
Δt_{\max}	0,100		
Mean value Δd	0,006		
Δd_{\max}	0,050		

The permissible limits are not exceeded.

Test of adherence of the coating

A lens was prepared corresponding to 2.5.1, after that the test of adherence of the coating according to 2.5.2 was realized.

After this test it was ascertained that the coating at no place removed from the basis material.

L i c h t t e c h n i s c h e s I n s t i t u t
U n i v e r s i t ä t K a r l s r u h e
L T I K

Prüfstelle für lichttechnische
Einrichtungen an Fahrzeugen

76128 Karlsruhe, den 04.05.94
Kaiserstraße 12
Telefon 0721 608 2551
Telefax 0721 66 19 01

PMT Reportextension AL 001

**Supplementary remarks to the reports No. PMT 001, PMT 002, PMT 003,
PMT 004, PMT 016, PMT 018, PMT 019, PMT 020, PMT 021, PMT 032, PMT 033,
PMT 038, PMT 039, PMT 040, PMT 041, PMT 042, PMT 043, PMT 044, PMT 045
und PMT 046.**

With the letter from 07.08.1993 Bayer AG applied to allow equal treatment of the following basis-materials

AL 2443 - hue 55/396
AL 2447 - hue 55/396
AL 2643 - hue 55/396
AL 2647 - hue 55/396

which are tested with several hardcoatings, registered in the above mentioned reports, and that these reports should be extended to these basis materials.

According to the manufacturer the difference between the basis material of the product group AL 2x43 to AL 2x47 is an additional release agent at AL 2x47 and the difference between the product group AL 24xx to AL26xx is a higher molecular weight of the product group AL 26xx.

As mentioned in the supplementary remarks of the reports no. PMT 001, PMT 002, PMT 003 and PMT 004 from 01.28.1993, there are no objections against equal treatment for the two materials AL 2443-hue 55/396 and AL 2447-hue 55/396.

To avoid the expenditure of a complete new approval, tests are made on special combinations of basis-materials and hardcoatings.

These combinations are as following

Basis-material	hardcoat	report
AL 2647-hue 55/396	Acryking K 101	PMT 038
AL 2443-hue 55/396	SHP 401/AS 4000	PMT 039
AL 2647-hue 55/396		PMT 040
AL 2447-hue 55/396		PMT 041
AL 2643-hue 55/396	SHP 401/SHC 4002	PMT 042
AL 2443-hue 55/396	PH 328	PMT 043
AL 2443-hue 55/396	PH 700	PMT 044
AL 2643-hue 55/396	HH 9800 U-N6	PMT 045
AL 2647-hue 55/396	UVT 200 Q1	PMT 046

Tests are made in accordance to the supplement 6 of the concerning ECE-headlamp regulations:

Requirements for Lamps incorporating lenses of plastic material

-Testing of lens or material samples and of complete lamps. (e.g. ECE-regulation no.20).

Test no. 2.2 to 2.5 are carried out.

The test no. 2.1 was done on lenses of basic-material AL 2647-hue 55/396 with hardcoating UVT 200 Q1 (PMT 046).

After these tests there is no significant difference in the results located. It is supposed, that other combinations of basis material and hardcoating lead to equal results as the materials proved in this connection.

There are no objections against an extension of the above mentioned reports to the basis materials:

AL 2443 - hue 55/396

AL 2447 - hue 55/396

AL 2643 - hue 55/396

AL 2647 - hue 55/396



Der Prüfstellenleiter

(Dr. K. Manz)