Manufacturer : **KWON CHEN MANUFACTURER CO., LTD.**
Type : **A-611**

TEST REPORT

according with ECE-Regulation

Uniform provisions concerning the approval of protective helmets and their visors for drivers and passengers of motor cycles and mopeds

ECE-R 22

including all amendments

Amend. 05, Suppl. 1

Previously granted		
ECE – approval	:	E13*22R00*22R05*0146*00

Structure of the test report :

0 General
1 Test object(s)
2 Test minutes
3 Comments to test object
4 Appendices
5 Statement of conformity

0. General

0.1	Trade name or mark	:	ARC
0.2	Type	:	A-611
0.3	Helmet category	:	See appendix L, item 9
0.4	Name and address		
	of the manufacturer	:	KWON CHEN MANUFACTURER CO , LTD No 113, Chung Shang Rd., Jen-Te Hsiang, Tainan Hsien, Taiwan, R O C.
	of the authorized representative	:	Not applicable
0.5	Number of information folder	:	A-611-01
	Date	:	April 8, 2011
	Revision status	:	--

1. Test object(s)

1.1	Description		
	Identification number	:	Prototype, marking after granting ECE-approval
	Type	:	A-611
1.1.1	Structure of the helmet	:	See appendix L, item 8
1.1.2	Structure of visor	:	See appendix L, item 11, for version A-611V
1.1.3	List of parts	:	See information document of the manufacturer
1.1.4	Location of the marking	:	Chinstrap
1.1.5	Helmet sizes	:	See appendix L, item 3
1.1.6	Material of the outer shell	:	See appendix L, item 8
1.1.7	Material of the visor	:	Polycarbonat (PC), for version A-611V

1.1.8	Marking of the visor	:	See appendix L, item 10, for version A-611V
1.2.	Remarks	:	--

2. Test minutes

2.1	Test equipment	:	The measurement equipment used was in compliance with the test requirements
2.2.	Test results		
2.2.1	Summary of test results	:	See test minutes Appendix 1
2.3	General information about the tests		
2.3.1.	Test object received on	:	March 21, 2011
2.3.2	Test date	:	March 21, 2011
2.3.3	Test site	:	TÜV Rheinland Kraftfahrt GmbH Technologiezentrum Verkehrssicherheit Typprüfstelle Fahrzeuge/Fahrzeugteile Postfach 91 09 51 D-51101 Köln / Germany
2.3.4	Remark	:	The results of the test refer exclusively to the object(s) mentioned at point 1 of this report

3. Comments to the test object : All variants and versions of the type as stated in the information document are covered with the test objects respectively.

4. Appendices

0 List of modifications

L Technical description of type and communication concerning the ECE-approval

1 Test minutes : Appendix 1

Information folder : A-611-01 (12 pages)

5. Statement of conformity

The above mentioned information folder and the type described in that comply with the requirements mentioned on page 1

Luxemburg, April 14, 2011

KWU/WW

M S.M.E K Wu

Manufacturer : **KWON CHEN MANUFACTURER CO., LTD.**
Type : **A-611**

List of modifications

Appendix 0

Correction of : --

Modification of : --

Addition of : - Version A-611P and A-611V

Deletion of : --

Manufacturer : **KWON CHEN MANUFACTURER CO., LTD.**
Type : **A-611**

Technical description of type and communication concerning the ECE-approval

Appendix L

1.	**Trade mark**	: ARC
2.	**Type** **Version**	: A-611 : A-611P and A-611V
3.	**Sizes**	: 55 (S), 57 (M), 59 (L), 61 (XL)
4.	**Manufacturer's name**	: KWON CHEN MANUFACTURER CO , LTD.
5.	**Address**	: No 113, Chung Shang Rd , Jen-Te Hsiang, Tainan Hsien, Taiwan, R O C
6.	**If applicable, name of manufacturer's representative**	: Not applicable
7.	**Address**	: Not applicable
8.	**Brief description of helmet**	: Protective helmet made of ABS (Acrylonitrile-Butadiene-Styrene) with lower face cover, protective padding made of EPS (Expanded Poly Styrene) in several parts The adaptation of the different head size is done by different thickness of protective liner and comfort paddings.
9.	**Helmet**	: Without protective lower face cover (J)
10.	**Type of visor or visors**	: A-613, for version A-611V only
11.	**Brief description of the visor**	: Clear visors, three dimensional injected, made of Polycarbonat (PC), thickness 2 8 mm, for version A-611V only
12.	**Submitted for approval on**	: March 21, 2011
14.	**Date of report of technical service**	: April 14, 2011

Test minutes **Appendix 1**

Summary of test results

1. General arrangement

1 1	General requirements of the helmets	:	The requirements of the covered zones are fulfilled for all helmet-sizes All external projections are rounded and smooth There are projections of the outer shell, greater than 2 mm. All external projections ≤ 2 mm have a radius ≥ 1 mm Under a load of 150 N the width of the chin strap is ≥ 20 mm The chin strap is covered with an additional comfort padding It is not possible to open the bottom of the automatic buckle with a ball of diameter 100 mm Manufacturer-information about size and weight is located on the outer shell by adhesive label(s) Additional consumer information, in accordance to the ECE-R22, is given by the owners manual, which is enclosed to the offered helmet. The helmet is not equipped with retroreflective parts in accordance to the item 6.16 of the ECE-R22 The requirement in respect of item 6 15 3 5 of the ECE-R22 for the visors are fulfilled, free from significant defects like bulbs, scratches, inclusions, dull spots, holes, mold marks and failures
1 2	Shock-absorption-tests	:	The determined values of acceleration were below the limit of 275 g at an impact speed of 7,5 m/s (esp 5,5 m/s at point S) The HIC-values were below the limit of 2400

helmet size : S 56
test-head-size : 54
anvil : Flat (Helm 1), Kerbstone (Helm 2)

Conditioning	Impact point	Res. acceleration [g]	HIC [-]
Helmet 1	B	182	1240
Low Temp (-20°C)	X	185	1462
	P	201	1615
	R	205	1912
	S	--	--
Helmet 2	B	162	1031
Heat (+50°C)	X	143	926
	P	164	1390
	R	165	1254
	S	--	--

helmet size : M 57
test-head-size : 57
anvil : Flat (Helm 3), Kerbstone (Helm 4)

Conditioning	Impact point	Res. acceleration [g]	HIC [-]
Helmet 3	B	181	1194
Ambient	X	180	1200
	P	203	2150
	R	189	1530
	S	--	--
Helmet 4	B	161	980
Ambient	X	142	923
	P	167	1552
	R	167	1265
	S	--	--

helmet size : L 59
test-head-size : 57
anvil : Flat (Helm 5), Kerbstone (Helm 6)

Conditioning	Impact point	Res. acceleration [g]	HIC [-]
Helmet 5	B	187	1260
Low Temp (-20°C)	X	228	1417
	P	213	2011
	R	231	2213
	S	--	--

Helmet 6	B	163	1066
Heat (+50°C)	X	150	906
	P	154	1359
	R	171	1463
	S	--	--

helmet size : XL 61
test-head-size : 60
anvil : Flat (Helm 7), Kerbstone (Helm 8)

Conditioning	Impact point	Res acceleration [g]	HIC [-]
Helmet 7	B	225	1231
Low Temp (-20°C)	X	176	996
	P	183	885
	R	194	1416
	S	--	--
Helmet 8	B	173	994
Heat (+50°C)	X	135	835
	P	161	1260
	R	153	964
	S	--	--
UV radiation and moisture of the outershell.	Values corresponds to the other test-values The here described conditioning of the helmets has no negative influence to the material		

1.3 Dyn test of the retention system

Helmet size	S 55	L 59	Limits
Test head size	54	57	
Dynamic movement (mm)	29.4	21.3	≤ 35 mm
permant movement after 2 min. (mm)	6.3	5.2	≤ 25 mm

1.4 Test of field of vision

Helmet size	S 55	L 59	Limits
Test head size	54	57	
Vertical angle of vision (°)			
Upwards	14	17	≥ 7°

Downwards	free	free	≥ 45°
Horizontal angle of vision (°)	210	211	≥ 210°

1.5 Rigidity-test

Helmet size	XL 61	Limits
Deformation under load (mm)		
Along the longitudinal axis	16.0	≤ 40 mm
Along the transversal axis	14.0	≤ 40 mm
Permanent deformation atfer 5 min		
Along the longitudinal axis	1.0	≤ 15 mm
Along the transversal axis	4.0	≤ 15 mm

1.6 Retention (detaching) test

Helmet size	S 55	L 59	Limits
Test head size	54	57	
Movement of the reference line (°)	17	17	≤ 30°

1.7 Chin strap and buckle test

1	Operation force of the automatic buckle according 7.11.2 Measured at static load of 150 N		
Helmet size	S 55		Limits
Test head size	54		
Openning force (N)	Automatic buckle: ≤ 30 N		≤ 30 N
2	Resistance of the automatic buckle according 7.11.2 The load of 2000 N at the automatic buckles made no fracture or disengage After the test the automaitc buckle was still capable of operation.		
3.	Microslip-test of the chin strap according 7.9		
	Automatic buckle: 2 mm	~~Double-D-ring: — mm~~	≤ 10 mm

4	Abrasion test the chin strap according 7 10 Not necessary in acc with 7 10 (a), because the movement of the chin strap after 500 cycles was less than 5 mm.

1 8 Shear assessment test for projections or irregularities in the outer surface according 7 4 2

	Test with positive result at the following points of the outer shell:	
Version A-611P	Side press button	Positive
Version A-611V	Cover of the visor fixing point	Positive

1 9 Test for friction assessment in acc with 7 4 2

1.	Main outer shell area	Positive

1 10 Visor tests: Test results were taken over from helmet type A-615, visor type A-613

1. Mechanical characteristics in acc. to 7.8.2

Helmet size	XL 61
Test head size	60
Conditioning of the visor	Low temp. (-20 °C)
Visor test piece 4	positive, no penetration, no sharp splinter
Visor test piece 5	positive, no penetration, no sharp splinter
Visor test piece 6	positive, no penetration, no sharp splinter

2. Optical characteristics and scratch resistance in acc. to 7.8.3

Test equipment:

a) Abrashion test in accordance to annex 10 of ECE R 22 05

LuminounsTransmission test in acc. to annex 11 item 2.1 method (b)	≥ 80 % ~~or 50 %~~*
Visor test piece 1	92.5 %
Visor test piece 2	93.5 %
Visor test piece 3	92.8 %

~~*) the visor is marked with the sentance / Sun symbol: „Daytime use only".~~

b) Light diffusion before abrashion test (Item 7.8.3.1.3.2) ≤ 2,5 %

Visor test piece 1	0.40 %
Visor test piece 2	0.28 %
Visor test piece 3	0.39 %

c) Light diffusion after abrashion test (Item 7.8.3.1.3.5) ≤ 20 %

Visor test piece 1	4.22 %
Visor test piece 2	4.48 %
Visor test piece 3	2.99 %

d) Spectral transmittance (Item 7.8.3.2.1.1.): τ_v in 500~650 nm ≥ $0.2\tau_v$

	τ_v	τ_v in 500~650 nm	$0.2\tau_v$
Visor test piece 1	0.894	0.886	0.18
Visor test piece 2	0.945	0.926	0.19
Visor test piece 3	0.943	0.928	0.19

e) Refractive powers (Item 6.15.3.8)

	Sperical effect [m^{-1}]	Astimatic effect [m^{-1}]	Horizontal Base [cm/m]		Vertical Base [cm/m]
			Out	In	
Limits	< ±0.12	< 0.12	1.00	0.25	0.25
Visor test piece 1	< 0.1	< 0.1	0.55	--	0.25
Visor test piece 2	< 0.1	< 0.1	0.55	--	0.03
Visor test piece 3	0.1	< 0.1	0.50	--	0.05

f) Recognition of signal lights (Item 6.15.3.6)

The test is dispensed as the clear visor with luminous transmittance values $\tau_v \geq 80$ %.

g) Mist retardant characteristics (Item 6.15.3.9)

~~The specular transmittance had a value ≥ 80% of the initial value 20 seconds after starting the test in accordance with annex 16.~~

These characteristics were not tested, because the test is optional.