



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 1 of 22	

TABLE OF CONTENTS

0.1 Circulation List

0.2 Amendment Record

FOREWORD

- 1. SCOPE**
- 2. REFERENCES**
- 3. TERMS AND DEFINITIONS**
- 4. REQUIREMENTS**
- 5. TESTS AND INSPECTION**
- 6. MARKING AND PACKING**
- 7. DOCUMENTATION**

ANNEX A: *Guaranteed Technical Particulars (to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records, four customer reference letters, the manufacturer's experience and copies of complete test reports for tender evaluation, all in English Language)*

Issued by: Head of Section, Standards Development

Signed:

Date: 2015-10-09

Authorized by: Head of Department, Standards

Signed:

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 2 of 22	

0.1 Circulation List

COPY NO.	COPY HOLDER
1	Manager, Standards
Electronic copy (pdf) on Kenya PowerServer (currently :Network-\\stima-fprnt-001\techstd&specs	

0.2 Amendment Record

Rev No.	Date (YYYY-MM-DD)	Description of Change	Prepared by (Name & Signature)	Approved by (Name & Signature)
0	2015-08-03	New Issue	Michael Apudo	Dr. Eng. Peter Kimemia

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 3 of 22	

FOREWORD

This specification has been prepared by the Standards Department in collaboration with Human Resource & Administration Department; Safety, Health & Environment Department (SHE) of The Kenya Power and Lighting Company Limited (KPLC/Kenya Power) and The Kenya Electrical Trade & Allied Workers Union. The specification lays down requirements for personal protective equipment (PPE) – protective helmets for motorcycle riders. It is intended for use by Kenya Power in purchasing these helmets.

The supplier shall submit information which confirms satisfactory service experience with products which fall within the scope of this specification

1. SCOPE

- 1.1. This specification lays down the requirements regarding material, construction, workmanship, finish, mass and performance for protective helmets (with lower face cover) for everyday use by motorcycle riders in KPLC.
- 1.2. It also specifies the requirements for protection, ergonomic characteristics, innocuousness, mechanical properties, marking and information for users. It also describes the appropriate test methods.
- 1.3. The specification stipulates the minimum requirements for protective helmets for motorcycle riders in the company and it shall be the responsibility of the supplier to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the helmets for The Kenya Power & Lighting Company.
- 1.4. The specification does not purport to include all the necessary provisions of a contract.

2. REFERENCES

The following standards contain provisions which, through reference in this text constitute provisions of this specification. Unless otherwise stated, the latest editions (including amendments) apply.

ISO/DIS 6220: Head-forms, for use in the testing of protective helmets.

BS 6658: Specification for Protective helmets for vehicle users

BS 4110: Specification for Visors for vehicle user

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 4 of 22	

BS EN 960: Head-forms for use in the testing of protective helmets

ECE Regulation No. 22: Uniform provisions concerning the approval of protective helmets for drivers and passengers of motor cycles and mopeds.

KS 77: Protective helmets for motorcyclists — Specification

3. TERMS AND DEFINITIONS

For the purpose of this specification, the definitions given in the reference standards shall apply

4. REQUIREMENTS

4.1. SERVICE CONDITIONS

The protective helmets for motorcycle riders shall be suitable for use outdoors in tropical climate with:

- Altitudes of up to 2200m above sea level,
- Humidity of up to 90%,
- Average ambient temperature of +30°C with a minimum of -1°C and a maximum of +40°C
- Heavy saline conditions along the coast and
- Isokeraunic levels of up to 180 thunderstorm days per year.

4.2. DESIGN AND CONSTRUCTION

4.2.1. General

- 4.2.1.1. The protective helmets for motorcycle riders shall be designed, manufactured and tested in accordance with BS 6658, KS 77, BS EN 960 and ISO/DIS 6220 and the visors used shall conform to BS 4110
- 4.2.1.2. The basic construction of the helmet shall be in the form of a hard outer shell containing additional means of absorbing impact energy and a retention system.
- 4.2.1.3. The protective helmet shall be fitted with ear flaps and a neck curtain. It shall also have a detachable peak, a visor and a lower face cover.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09

Part 3: Helmet

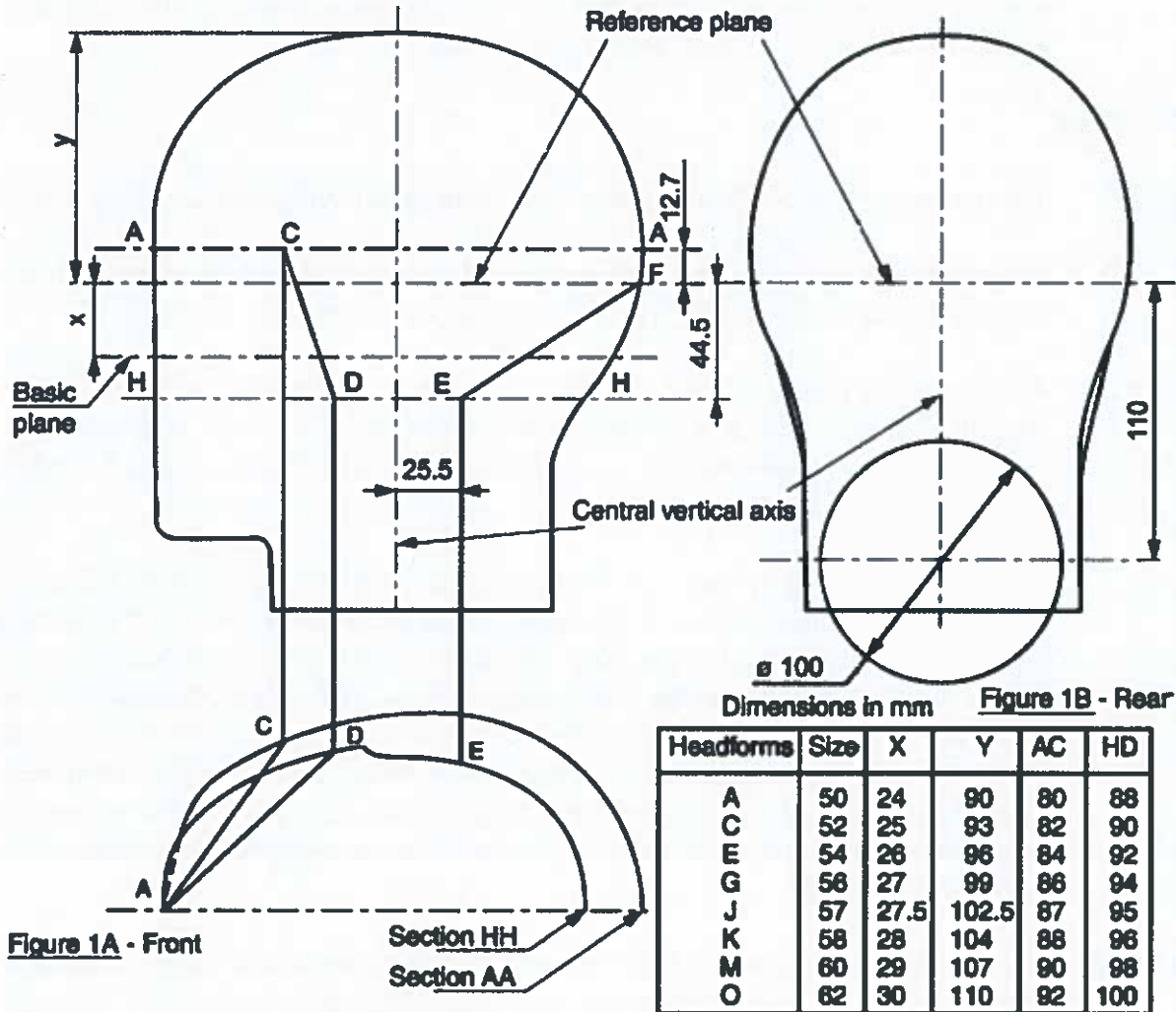


Figure 1A & B – Minimum extent of protection

- 4.2.1.4. No component or device shall be fitted to or incorporated in the protective helmet unless it is designed in such a way that it shall not cause injury and that, when it is fitted to or incorporated in the protective helmet, the helmet still complies with the requirements of this specification.
- 4.2.1.5. The characteristics of the materials used in the manufacture of helmets shall be known not to undergo appreciable alteration under the influence of ageing, or of the circumstances of use to which the helmet is normally subjected, such as exposure to

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:



Signed:



Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 6 of 22	

Part 3: Helmet

sun, extremes of temperature and rain. For those parts of the helmet coming into contact with the skin, the materials used should be known not to undergo appreciable alteration through the effect of perspiration or of toilet preparations. The materials known to cause skin troubles should not be used.

4.2.2. Shell

- 4.2.2.1. The extent of the protection provided shall be as given in clauses 4.2.2.2 to 4.2.2.8.
- 4.2.2.2. The shell shall cover all areas above plane AA and shall extend downwards at least as far as the lines CDEF on both sides on the head-form (see Fig. 1A & B).
- 4.2.2.3. At the rear, the rigid parts and, in particular the shell shall not be within a cylinder of diameter 100 mm, with axis situated at the intersection of the medium plane of symmetry of the head-form and of a plane parallel to and 110 mm below the reference plane (see Fig. 1A & B).
- 4.2.2.4. The helmet shall not dangerously affect the wearer's ability to hear and shall conform to the requirements laid down in clause 9.5 of BS 6658. Ventilation shall be provided for increasing the comfort of the rider. The outer surface shall be perfectly smooth. Above the reference plane, the shape shall be in the form of a continuous, convex curve except where shaping is provided for functional purposes. Below the reference plane, irregularities in the cure shall be smoothly faired. The shell shall not incorporate an integral peak, but may incorporate an integral lower face cover. Where means for attaching a visor are not provided, the profile at the front edge shall not prevent the wearing of goggles.
- 4.2.2.5. There shall be no external projections greater than 5 mm above the outer surface of the shell. Where a goggle fitting is provided at the rear of the helmet and is designed to be detachable this requirement shall not apply to such a fitting.
- 4.2.2.6. Any external projections other than press fasteners shall be smooth and adequately faired. Rivet heads shall be reduced and shall not project more than 2 mm above the outer surface of the shell.
- 4.2.2.7. There shall be no inward-facing sharp edges on the inside of the helmet. Rigid projecting internal parts shall be covered with padding so that any stresses transmitted to the head are not highly concentrated. Rivet heads shall be reduced and shall not project more than 2 mm above the internal surface of the shell.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09

Part 3: Helmet

4.2.2.8. The components of the helmet which are intended to protect the head of the user shall be assembled such that they may not become easily detached or move under the conditions of the test as specified in clause 4.5 of this specification.

4.2.3. Protective Padding

The protective padding shall cover as the areas defined in 4.2.2.1 taking into account the requirements given in 4.2.2.3.

4.2.4. Retention System

The helmet shall be held in place on the wearer's head by means of a retention system which is secured under the lower jaw and is firmly attached to the shell. The illustration details of the helmet shall be as per Fig. 2.

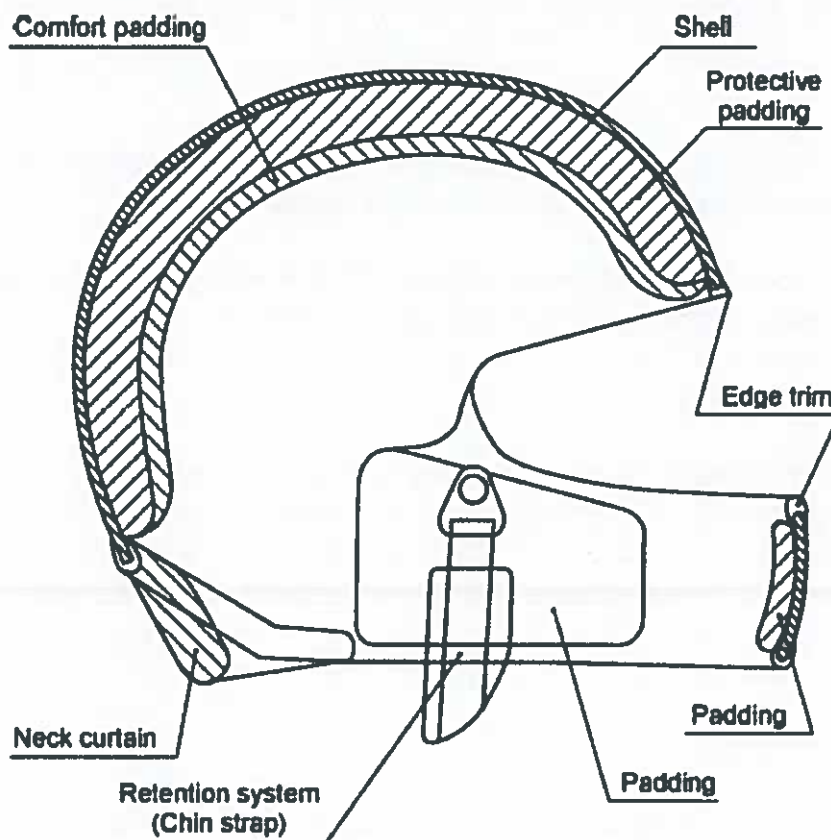


Figure 2- A typical sketch showing internal components of helmet

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:



Signed:



Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**
Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 8 of 22	

4.2.5. Chin Strap

- 4.2.5.1. The strap shall not be less than 20 mm wide under a load of (150 N ± 5) N applied during dynamic test of the retention system.
- 4.2.5.2. The chin strap shall not include a chin cup.
- 4.2.5.3. The device to open the retention system shall not be capable of opening other than as a result of a deliberate act. In the case of a press fastener opening device, the press-fastener shall be recessed that is, the surface to which the pressure is applied shall be fitted with a fairing about its whole periphery so that opening does not occur when the surface is pressed with a sphere of 100 mm diameter.
- 4.2.5.4. The retention of the helmet on the head by the retention system shall be verified when the test described in clause 9.6 of BS 6658 is carried out.

4.2.6. Peripheral Vision

- 4.2.6.1. The helmet shall be placed on the head-form (see ISO/DIS 6220) corresponding to its size by the procedure as specified in this standard.
- 4.2.6.2. In the conditions mentioned in clause 4.2.6.1, there shall be no occultation in the field of vision and shall satisfy the following requirements:

a) Horizontally

Two segments of dihedral angles symmetrical in relation to the median longitudinal vertical plane of the head-form and situated between the reference and the basic planes. Each of these dihedral angles is defined by longitudinal vertical median plane of the head-form and the vertical plane forming an angle of not less than 105° with the median longitudinal vertical plane and whose edge is the straight line L₁, L₂; the points L₁ and L₂ representing the eyes (see Fig. 3a & b).

b) Upwards

A dihedral angle defined by the reference plane of the head-form and a plane forming an angle of not less than 7° with the reference plane and whose edge is the straight line L-K.

Issued by: Head of Section, Standards Development	Authorized by: Head of Department, Standards
Signed: 	Signed: 
Date: 2015-10-09	Date: 2015-10-09

Part 3: Helmet

c) Downwards

A dihedral angle defined by the basic plane of the head-form and a plane forming an angle of not less than 45° with the basic plane and whose edge is the straight line K_1, K_2 .

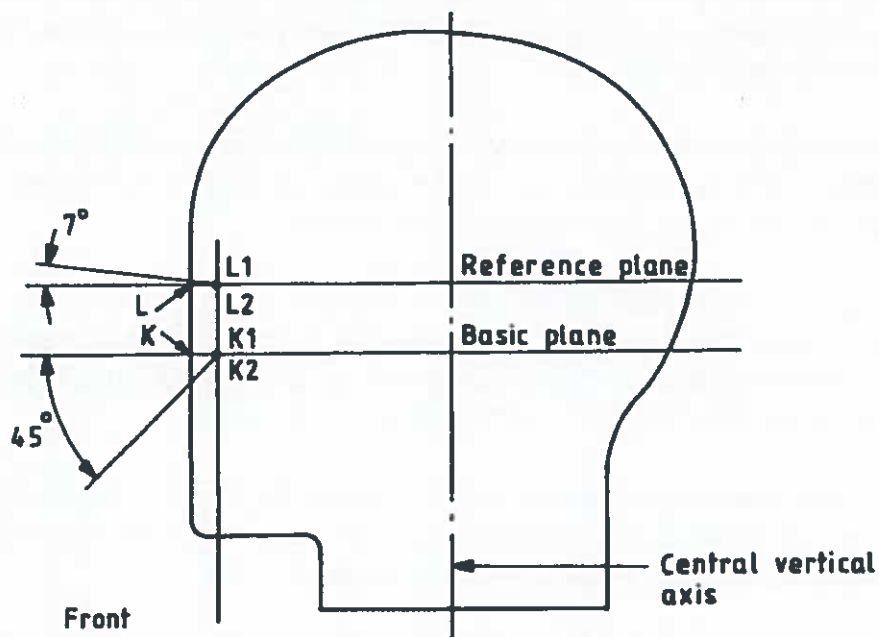


Figure 3a- Section of head-form on a longitudinal vertical plane

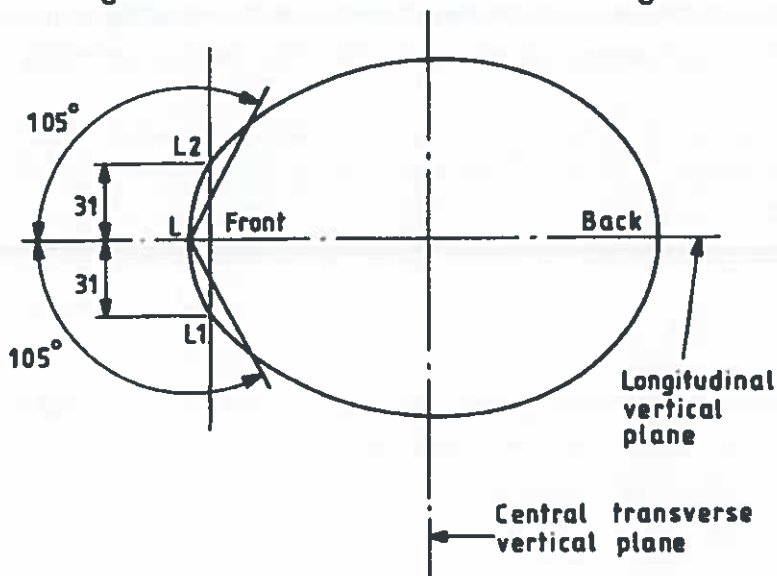
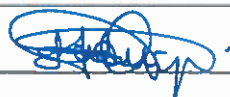


Figure 3b – Section of head-form in reference plane

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:



Signed:



Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 10 of 22	

4.2.7. Visors

- 4.2.7.1. The visors used shall conform fully to the requirements of BS 4110 and KS 77:2012.
- 4.2.7.2. The requirements in regard to visor shall not be reducing the peripheral vision afforded by the helmet. When in any designed open mode, functional features shall only be provided where their total area does not exceed 250 mm² on either side of the vertical centre-line of the visor.
- 4.2.7.3. These features shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor. In all modes of operation, visor markings shall not be visible in the field of vision offered by the helmet.
- 4.2.7.4. Ventilation features that are provided on the lens of the visor shall be formed from the visor material itself. They shall be an integral part of the visor, and shall not be painted or covered by any other means. They shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor.
- 4.2.7.5. The total area of such features shall not exceed 500 mm² on either side of the vertical centre-line of the visor, and their design shall be such that the wearer is still protected in these regions from impacts and/or airborne particles.
- 4.2.7.6. Lifting elements shall be formed from the visor material itself and shall be an integral part thereof. Where a lifting element which overlaps the vertical centre-line of the visor is provided, it shall not encroach more than 5 mm from the visor edge and shall have a peripheral length not exceeding 10 mm each side of the vertical centre-line of the visor.
- 4.2.7.7. Where a lifting element or lifting elements are provided at the side or sides of the visor, they shall not encroach more than 5 mm from the visor edge and shall have a peripheral length not exceeding 25 mm. Such lifting elements shall not be situated in the defined ocular areas in any of the designed modes of operation of the visor.

4.3. WORKMANSHIP AND FINISH

- 4.3.1. The helmet shall have RAL 363 - **bold yellow** colour finish. It shall be marked at the factory (in indelible ink or superior method) with **Kenya Power** logo in blue colour with the word spacing of 80mm x 120mm ±5mm centrally positioned at the back of the helmet.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 11 of 22	

- 4.3.2. All edges shall be smooth and rounded. Any external or internal projection permitted under clauses 4.2.2.4, 4.2.2.5 and 4.2.2.6 shall be soft, smooth and adequately faired to other surfaces.
- 4.3.3. Retro-reflective tape/material shall be applied to the helmets. The retro-reflective tape shall be applied on the front and back of the helmet as well as both sides to provide 360° reflectivity. The tape shall also be applied to earmuffs to ensure that the tape on the sides of the helmet cannot be obscured. Other stickers should be placed on a hardhat in such a way as to not obstruct the retro-reflective tape.

4.4. MASS

The helmets with lesser mass are preferred and may be available with the increasing availability of more advanced composites and materials. However, mass of the complete helmet (without peak, visor and detachable lower face cover), shall not exceed 1500g.

4.5. PERFORMANCE REQUIREMENTS

4.5.1. Impact Absorption Test

4.5.1.1. Types of conditioning

Prior to any type of further conditioning for mechanical tests, each helmet shall be subjected to:

a) Solvent conditioning

Take a cotton cloth approximately 150 mm square and a quantity approximately 25 ml of a solvent consisting of test liquid with 70 percent octane and 30 percent toluene. Using the cloth soaked in solvent, apply the solvent to all those regions of the outside surface of the helmet shell within 50 mm of the chin strap fixings and keep these regions wet within the solvent for 7.5 ± 2.5 seconds. Repeat the procedure on the remainder of the external surface including any chin guard, keeping these regions wet for 12.5 ± 2.5 seconds. No further conditioning or testing shall be done during the following 30 minutes.

b) Ambient (Temperature and humidity) condition

The helmet shall be exposed to a temperature of $25 \pm 5^{\circ}\text{C}$ and a relative humidity of 65 ± 5 percent for at least 4 hours in an oven.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 12 of 22	

c) Heat conditioning

The helmet shall be exposed to the temperature of $50 \pm 2^{\circ}\text{C}$ for not less than 4 hours and not more than 6 hours in dry heat.

d) Low temperature

The helmet shall be exposed to the temperature of $-20 \pm 2^{\circ}\text{C}$ for not less than 4 hours and not more than 6 hours in cold chamber.

e) Ultraviolet – radiation conditioning and moisture conditioning

The outer surface of the protective helmet shall be exposed to ultraviolet radiation by a 125 watt zenon filled quart lamp for 48 hours at a range of 25 cm subsequently spraying for 4 to 6 hours with water at ambient temperature at the rate of 1 litre per minute.

4.5.1.2. Test method for impact test

The conditioned helmet shall be tested for impact absorption test method BS 6658:1985 and KS 77:2012. The first impact shall be carried out within 45 seconds. All the subsequent impacts shall be completed within not more than 5 minutes after subjecting to the conditions specified in 4.3.1.1 (a) to (e) above, and samples to be conditioned shall be as per Table 1 of BS 6658:1985.


The conditioned helmet shall meet the requirements, when resultant acceleration (RMS value of acceleration measured along the three directions) measured at the centre of gravity of the head-form shall be $\leq 150 g_n$ (where $g_n = 9.81 \text{ m/sec}^2$) for any 5 milliseconds continuously and at no time exceeds $300 g_n$.

4.5.2. Resistance to penetration test

Helmet shall be subjected to test in accordance to the method specified in BS 6658:1985 and KS 77:2012 at two points within the area of protection at least 75 mm distant from each other and from any earlier point of impact, after subjected to process of conditioning which has given the best, satisfactory results in impact – absorption test. During the test, the head of punch shall not come closer than 5 mm measured vertically to the head-form.

4.5.3. Rigidity Test

The helmet shall be tested by the method prescribed in BS 6658:1985 and KS 77:2012 and shall meet the following requirements;

Issued by: Head of Section, Standards Development	Authorized by: Head of Department, Standards
Signed: 	Signed: 
Date: 2015-10-09	Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 13 of 22	

- (i) Along each axis, the deformation measured under 630 N load shall not exceed by 40 mm than that measured under the initial 30 N load.
- (ii) After restoration of 30 N load, the deformation measured shall not exceed by 15 mm than that measured under the initial 30 N load.

4.5.4. Dynamic Test of Retention system

Helmet shall be tested for their retention system by the method given in BS 6658:1985 and KS 77:2012 and it shall meet the following requirements:

- (i) The dynamic displacement of the point of application of the force shall not exceed 35mm.
- (ii) After two minutes, the residual displacement of the point of application of the force, as measured under a mass of 15 ± 0.5 kg shall not exceed 25 mm.
- (iii) Damage to the retention, system shall be accepted provided that it is still possible to take the helmet easily off the head-form and that the requirements given in (i) and (ii) above are met.

4.5.5. Audibility Test

The helmet shall be tested for their sound attenuation properties by the method given in BS 6658:1985 and KS 77:2012. The sound transmission loss shall be not more than 10 dB over the frequency range 250 to 2 000 Hz.

4.5.6. Retention Test of Helmet

- 4.5.6.1. The helmet previously conditioned at ambient temperature and humidity, shall be placed on and secured to the appropriate head-form, selected from those listed in Fig. 2A and 2B, in accordance with the requirements given in BS 6658:1985 and KS 77:2012
- 4.5.6.2. A device to guide and release a falling mass (the total mass- being 3 ± 0.1 kg) is hooked on to the rear part of the shell in the median vertical plane of the helmet, as shown in Figure. 7 of BS 6658:1985.
- 4.5.6.3. The falling mass of ($10 \text{ kg } 1 \pm 0.01 \text{ kg}$) is then released and drops in a guided free fall from a height of $0.50 \text{ m } \pm 0.01 \text{ m}$.
- 4.5.6.4. After the test, the angle between the reference line situated on the crown of the helmet and the reference plane of the head-form shall not exceed 30° .

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 14 of 22	

4.5.7. Opening Angle (Visor) Test



- 4.5.7.1. The helmet, fitted with the visor being tested, shall be placed on a test head-form of appropriate size, selected from those listed in Figure. 2A, in accordance with the provisions given in BS 4110 and KS 77:2012.
- 4.5.7.2. When the visor is in the raised position, the angle between the secant MN defined in Figure. 8 of BS 6658:1985 and the horizontal shall be at least 5°, with the point M situated below the horizontal plane passing through point N.
- 4.5.7.3. The following shall be the characteristics of the visor as per KS 77:2012 and proof of test shall indicate compliance to the following parameters as per table 1 below:

Table 1: Functional characteristics of the visor

Parameter		Required	Test method	
Luminance transmittance τ_y , relative to the standard illuminant D65		80%	Annex B of KS 77	
Light diffusion,	Before abrasion	<0.65 cd/m ² /l		
	After abrasion	<5.0 cd/m ² /l		
Relative visual attenuation quotient (Q)		>0.80 for red and yellow signal lights; >0.60 for green signal light; >0.40 for blue signal light.		
Spectral transmittance in the range 500 nm to 650 nm,		>0.2. τ_y		
Permissible refractive power values for visors	Spherical effect, m ⁻¹	0.12		
	Astigmatic effect, m ⁻¹	0.12		
	Prismatic effect difference	Horizontal, cm/m	Base in 1.0 Base out 0.25	
		Vertical cm/m	0.25	

4.5.8. Flexibility of Peak

Where provided, it shall be tested by the method described in BS 6658:1985 and KS 77:2012. The peak shall neither break nor become detached from the helmet. Its deflection shall be between 6 mm and 32 mm

Issued by: Head of Section, Standards Development	Authorized by: Head of Department, Standards
Signed: 	Signed: 
Date: 2015-10-09	Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 15 of 22	

4.6. SAMPLES FOR TESTING

In order to determine whether a lot of protective helmets containing up to 500 helmets of one class, type, size and origin, complies with the standard, a sample of 6 helmets shall be taken at random from the lot and tested as per the test schedule specified in clause 5.0.

4.7. QUALITY MANAGEMENT SYSTEM

- 4.7.1. The supplier shall submit a quality assurance plan (QAP) that will be used to ensure that the requirements for protection, ergonomic characteristics, innocuousness, mechanical properties, marking of the protective helmet for motorcycle riders, will fulfill the requirements stated in the contract documents, standards, specifications and regulations.
- 4.7.2. The Manufacturer's Declaration of Conformity to applicable standards and copies of quality management certifications shall be submitted with the tender for evaluation.

5. TESTS AND INSPECTION

- 5.1. The protective helmet for motorcycle riders shall be inspected and tested in accordance with ISO/DIS 6220, BS 6658, BS 4110, BS EN 960, KS 77 and the requirements of this specification. It shall be the responsibility of the supplier to perform or to have performed all the tests specified.
- 5.2. Copies of previous **Test Reports confirming conformity to clause 4 for the protective helmet for motorcycle riders issued by a third party testing laboratory that is accredited to ISO/IEC 17025** shall be submitted with the tender for the purpose of technical evaluation. The accreditation certificate for the third party testing laboratory shall also be submitted with the tender (all in English Language).
- 5.3. Test Reports for the protective helmet for motorcycle riders to be supplied under the contract shall be submitted to The Kenya Power & Lighting Company for approval before shipment/delivery and shall include all the tests in clause 4.5:
- a) Peripheral vision test
 - b) Penetration resistance test
 - c) Effectiveness of retention system test
 - d) Strength of retention system test
 - e) Shock absorption test
 - f) Sound attenuation test
 - g) Rigidity test

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 16 of 22	

- h) Visor test
- (i) Field of vision
 - (ii) Luminous transmittance, Light diffusion, Recognition of signal lights, Spectral transmittance
 - (iii) Mist retardant visor
 - (iv) Refractive powers
 - (v) Mechanical characteristics
 - (vi) Optical quality and scratch resistance

5.4. The protective helmet for motorcycle riders shall be subject to acceptance tests at the manufactures' works before dispatch. Acceptance tests (routine & sample tests) will be witnessed by at least two (2) Tender Processing Committee (TPC) members appointed by The Kenya Power and Lighting Company Limited (KPLC). Routine and sample test reports for the protective helmet for motorcycle riders to be supplied shall be submitted to KPLC for approval before shipment of the goods.

5.5. Tests to be witnessed at the factory before shipment shall be in accordance with ISO/DIS 6220, BS 6658, BS 4110, BS EN 960, KS 77 and this specification and shall include the following:

- a) Peripheral vision test
- b) Effectiveness of retention system test
- c) Strength of retention system test
- d) Sound attenuation test
- e) Visor test
 - (i) Field of vision
 - (ii) Luminous transmittance, Light diffusion, Recognition of signal lights, Spectral transmittance
 - (iii) Mistretardant visor
 - (iv) Refractive powers
 - (v) Mechanical characteristics
 - (vi) Optical quality and scratch resistance

NOTE: The test report shall include at least the following information:

- a) The number and year of publication of this Standard;
- b) The name or trademark of the manufacturer or the body taking responsibility for manufacture;
- c) Identification details of the protective helmet tested as specified in clause 6.1.
- d) Illustrations of the front and side of the helmet; a test line should be drawn on the illustration.

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 17 of 22	

- e) Results of tests in accordance with Clause 5, including information to clearly identify the impact test locations for each helmet tested;
- f) Any evidence that shows conformity with requirements in clause 4 and 5;
- g) Date of testing;
- h) Name of technician who performed the testing and if applicable, the laboratory manager or supervisor,
- i) Name of testing laboratory.

5.6. On receipt of the helmets, KPLC will inspect them and may perform or have performed any of the relevant tests in order to verify compliance with the specification. The supplier shall replace without charge to KPLC, helmets which upon examination, test or use fail to meet any of the requirements in the specification

6. MARKING AND PACKING

6.1. Marking

Every helmet shall have indelibly printed on it or otherwise permanently affixed to it, the following information, clearly and prominently displayed in no less than 8 point font:

- (i) The name of the manufacturer;
- (ii) Website address of the manufacturer or other contact information;
- (iii) The model name or model number of the product;
- (iv) The size or size range of the circumference of the helmet, quoted as the circumference (in centimeters) of the head which the helmet is intended to fit; and
- (v) The week, month and year of manufacture of the product
- (vi) The words, "intended for motorcycle riders;" "fasten the chin strap" and "Property of KPLC" on a label attached to the strap.
- (vii) The Kenya Power and Lighting logo symmetrically positioned in the front phase of the shell.

6.2. Packaging

The packaging in which the helmet is sold or is to be sold shall have indelibly printed on it or otherwise permanently affixed to it, clearly and prominently displayed, the information required by clause 6.1.

7. DOCUMENTATION

7.1. The bidder shall submit its tender complete with technical documents required by Annex A (Guaranteed Technical Particulars) for tender evaluation. The technical documents to be submitted (all in English language) for tender evaluation shall include the following:

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:

**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.

KP1/6C.1/13/TSP/01/009-3

Issue No.

1

Revision No.

0

Date of Issue

2015-10-09

Page 18 of 22

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Copies of the Manufacturer's catalogues, brochures, drawings and technical data;
- c) Sales records for the last five years and at least four customer reference letters;
- d) Details of the manufacturer's experience;
- e) Copies of required test reports by a third party testing laboratory accredited to ISO/IEC 17025 and a copy of accreditation certificate to ISO/IEC 17025 for the third party testing laboratory;
- f) Manufacturers letter of authorization, QMS certificate and other technical documents required in the tender.
- g) Packaging details (including packaging materials).

7.2. The successful bidder (supplier) shall submit the following documents/details to The Kenya Power & Lighting Company for approval before manufacture:

- a) Guaranteed Technical Particulars signed by the manufacturer;
- b) Design Drawings with details of the motorcycle footwear to be manufactured for KPLC.
- c) Quality assurance plan (QAP) that will be used to ensure that the design, material; workmanship, tests, service capability, maintenance and documentation will fulfil the requirements stated in the contract documents, standards, specifications and regulations. The QAP shall be based on and include relevant parts to fulfil the requirements of ISO 9001:2008
- d) Detailed test program to be used during factory testing;
- e) Marking details and method to be used in marking the motorcycle footwear;
- f) Manufacturer's undertaking to ensure adequacy of the design, good engineering practice, adherence to the specification and applicable standards and regulations as well as ensuring good workmanship in the manufacture of the motorcycle footwear for The Kenya Power & Lighting Company;
- g) Packaging details (including packaging materials).

7.3. The helmet for motorcycling shall be supplied with information and instructions for use. Instructions shall be precise, comprehensible and in English language to KPLC store. They shall contain at least the following information:

(i) Warnings

Every product shall have indelibly printed on it or otherwise permanently affixed to it the following information statements, clearly and prominently displayed:

- Words to the following effect: For adequate protection this helmet must fit closely. Purchasers are advised to secure the helmet and to ensure that it cannot be pulled or rolled off the head.
- Words to the following effect: This helmet is made to absorb some of the energy of a blow by partial destruction of its component parts and, even though damage may

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 19 of 22	

not be apparent, any helmet which has suffered an impact to the head in an accident or received a similar severe blow or other abuse shall be replaced.

- Words to the following effect: To maintain the full efficiency of this helmet there must be no alteration to the structure of the helmet or its component parts.
- For helmets fitted with a single chin strap, words to the following effect: The chin strap must pass underneath the jaw to maintain tension all the time the helmet is in use. The law requires that the helmet be securely fastened to the head.
- Words to the following effect: The protection given by this helmet may be severely reduced by the application of paint, adhesive stickers and transfers, cleaning fluids and other solvents. Use only materials recommended by the helmet manufacturer.

(ii) Instructions

Every product shall bear or be accompanied by legible written instructions that clearly state the following information, with line drawings or photographs illustrating the sequence of steps where needed:

- a) How the product is to be fitted and adjusted properly;
- b) How the product is to be assembled, if applicable
- c) How the product should be inspected for deficiencies;
- d) How the product is to be maintained, cleaned and dried; and
- e) How the product is to be stored.

-----SPACE LEFT BLANK-----

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 20 of 22	

ANNEX A: Guaranteed Technical Particulars (to be filled and signed by the Manufacturer and submitted together with relevant copies of the Manufacturer's catalogues, brochures, drawings, technical data, sales records, four customer reference letters, the manufacturer's experience and copies of complete type test reports for tender evaluation, all in English Language)

Tender No.

Clause number	KPLC requirement	Bidder's offer (indicate full details)	
Manufacturer's Name and address		specify	
Country of Manufacture		specify	
Type designation or model as per the catalogue		specify	
Standards of manufacture		specify	
Service conditions for use		specify	
Construction	Basic construction	specify	
	Design to avoid injury		
	Characteristics of materials		
Shell	Shall cover all areas as far as the lines CDEF of Fig.1	specify	
	Shell coverage	Describe	
	Shall not impede wearers ability to hear	Describe	
	No projections beyond 5mm	Describe	
	Rivet heads shall not protrude more than 2mm	Describe	
	All components shall not easily be detached	Describe	
Protective padding	As per figure 2 – Shall cover all the areas CDEF of the head form in Fig. 1	Specify	
Retention system	Shall be firmly attached to the shell to secure the lower jaw	Specify	
Chin strap	>20mm wide under a load of (150 N ± 5) N	Specify and attach test report	
	No chin cup		
	Retention system shall not be capable of opening other than as a result of a deliberate act	Specify	
Peripheral vision	Shall be as per ISO/DID 6220	Attach drawing	
	No occultation in the field of vision		Horizontally
			Upwards
	Downwards		
Visors	As per BS 4110 and KS 77:2012.	specify	
	Shall not reduce peripheral vision		
	Functional features shall be located in less than an area		

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 21 of 22	

Clause number	KPLC requirement			Bidder's offer (indicate full details)
	of 250mm ²			
	Visor markings shall not be visible in the field of vision			
	Ventilation features shall be of the visor material covering not more than 500mm ²			
	Lifting elements formed from visor material			
	Shall not encroach more than 5mm from the edge of visor			
Workmanship and finish	Colour and logo finish			specify
	Edges shall be smooth and rounded			specify
	Retro-reflective tape applied on the front and back			
Mass	Shall not exceed 1500g.			specify
Performance requirements	Impact absorption test	Types of conditioning	Solvent conditioning	specify
			Ambient condition	specify
			Heat conditioning	specify
			Low temperature	specify
			UV-radiation & moisture	specify
	Test methods for impact test			specify
	Resistance to penetration test			specify
	Rigidity Test			specify
	Dynamic Test of Retention system			specify
	Audibility Test			specify
	Audibility Test			specify
Retention Test of Helmet			specify	
Opening angle (visor) test			specify	
Flexibility of Peak			specify	
4.6	Quality Management System			Provide
	Quality Assurance Plan			Provide
	Copy of ISO 9001:2008 Certificate			Provide
	Manufacturer's experience			Provide
	Manufacturing Capacity (units per month)			Provide
	List of previous customers			Provide
	Customer reference letters			Provide
5.1	Test standards and responsibility of carrying out tests			Provide
5.2	Copies of Type Test Reports submitted with tender			Provide
5.3	Acceptance tests to be witnessed by KPLC at factory before shipment			Provide
5.4	Test reports to be submitted by supplier to KPLC for approval before shipment			Provide
5.5	Replacement of rejected helmets			Provide
6.1	Markings			Provide
6.2	Packing			Provide

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09



TITLE:
**SPECIFICATION FOR
PERSONAL PROTECTIVE
EQUIPMENT (PPE)
FOR
MOTORCYCLE RIDERS**

Part 3: Helmet

Doc. No.	KP1/6C.1/13/TSP/01/009-3
Issue No.	1
Revision No.	0
Date of Issue	2015-10-09
Page 22 of 22	

Clause number	KPLC requirement	Bidder's offer (indicate full details)
7.1	Documents submitted with tender	Provide
7.2	Instruction manual contents	Provide
7.3	Documents to be submitted by supplier to KPLC for approval before manufacture	Provide
8.0	Statement of compliance to specification	Provide

.....
Manufacturer's Name, Signature, Stamp and Date

NOTE:

*The **Guaranteed Technical Particulars (GTP)** shall form the basis of technical tender evaluation. Bidders shall ensure that the offered values for the item conform to the values in the test reports and their certificates, catalogue references and/or brochures. Failure to adhere by this requirement shall lead to automatic disqualification at the technical evaluation stage.*

Issued by: Head of Section, Standards Development

Authorized by: Head of Department, Standards

Signed:

Signed:

Date: 2015-10-09

Date: 2015-10-09