

सीएसआईआर- केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)  
बरवा रोड, धनबाद - 826015, झारखण्ड, भारत



CSIR-Central Institute of Mining & Fuel Research

( Council of Scientific & Industrial Research )  
Barwa Road, Dhanbad - 826015, Jharkhand, India

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Test & Assessment Report No.: IN/CIMFR/TR20 **237**

Dated: **21** January, 2020

ID No. 135/19

ULR No.: TC59622000000210F

TC CODE NO. FES/87 (BY)19-20

To  
M/S. KESHKAMAT & COMPANY  
9/129, ADARSH NAGAR, PRABHADEVI,  
MUMBAI - 400 030

**Subject:** Type Examination Certificate along with test assessment report of Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure, in cast aluminium Alloy LM-6 construction designated by Model: KK/DOM/IR/LED/19, Cat. No.: KK/MISC/2019/01 as per IS/IEC 60079-1:2014 for use in Gas Group: IIB, EPL, Gb atmosphere.

-(Test Report)

Your Ref. Appli. No.: KK/CIMFR/19/03

Dated: 07/07/2019

Dear Sir,

Please find the enclosed Type Examination Certificate along with test assessment report of the above sample submitted by you.

*This Institute reserves the right to review, amend or withdraw this 'Revalidation Test Report' at any time, if considered necessary in the interest of safety.*

Charges of Rs. 1,02,790/- (Rupees One Lakh Two Thousand Seven Hundred Ninety Only) including applicable service tax involved towards the testing have been adjusted against the advance deposit made by you.

Kindly arrange to collect the sample within 90 days from the date of receipt of this letter failing which CIMFR would dispose of the samples by public auction without any further NOTICE to you.

Kindly acknowledge the receipt.

Thanking you,

Yours faithfully,

*S. K. Mondal*  
21/01/2020

(S. K. MONDAL)  
HOS  
TESTING CELL

Encl: As above.

1. Test assessment report in Four copies

2. Type Examination Certificate

Copy to: 1. Head, Flameproof & equipment Safety

2. Bill section



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ज्वालासह एवं उपकरण सुरक्षा / FLAME PROOF & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र / TEST CERTIFICATE



NABL Certificate No.: TC-8962

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FORMAT NO.: (CIMFR: DQM: FLP02: F-01:REV-01)

(Flameproof & Equipment Safety)

Equipment ID No.: 135/19 ULR No.: TC596220000000210F Code No. PES/87(B)/19-20

Test & Assessment Report No.: (NCIMFR/TR20) 231 Dated: 21 January, 2020

Application Ref. No.: KK/CIMFR/19/03 Dated: 07/07/2019

1. Applicant : M/S. KESHUKAMAT & COMPANY  
9/129, ADARSH NAGAR, PRABHADEVI,  
MUMBAI - 400 030
2. Manufacturer : Same as above
3. Equipment : Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure.
4. Designated by : Model: KK/DOM/IR/LED/19, Cat. No.: KK/MISC/2019001.
5. Gas Group, EPL : Group : IIB atmosphere, EPL, Gb.
6. Electrical ratings : Rated 240V, 23W LED.
7. Temperature Class : T6
8. Degree of Ingress Protection : IP-66
9. Material of Construction : Cast aluminium Alloy LM-6 construction. Refer drawing for material thickness at different locations of the enclosure.

10. Description of the equipment: Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure.

Description	Volume in cc		Min. Wall Thickness (mm)	Nos. & Size of Bolts/Fasteners
	Gross	Net		
Single Enclosure	6000	950	10mm	Threaded joint

A.		B.	
Glass details		Max no. of aperture on cover	
Size = Ø250mm, Shape = circular		One No.	
Type = Toughened Polished, Thickness = 16mm			
Cement path = 28mm, Sealing compound = Epoxy Resin+hardner			
Make = Araldite			
COT = -20°C to 120°C			

*B. M. Mohale*

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परीक्षण रिपोर्ट / TEST REPORT

FORMAT NO.: (CIMPR: DQM: PLO2: F-01:REV-01)  
(Flameproof & Equipment Safety)

Equipment ID No.: 135/19 ULR No.: TC59622000000210F Code No. FES/87(B)/19-20

11. Nature of Flameproof Joint: Type of joints and gaps (Spigot joint, Threaded joint, Cylindrical joint for Gas Gr. HB)

Sr. No	Location of flamepath	Type of Joint	Min. length of flamepath (in mm)		Max. gap (in mm)/no. of threads (pitch)	
			Req.	Spec.	Req.	Spec.
1.	Between enclosure body and glass cover	Threaded	8	15	5T	10T (1.5P)
2.	Between enclosure body and cover	Threaded	8	15	5T	10T (1.5P)

Max. No. & size of cable entries: cable entries of details

Sr. No.	Max. Size of Cable Entries	Nos. of Cable entries provided in test sample			
		Side - A	Side - B	Side - C	Side - D
1.	M25X1.5P (L = 20mm, T=13nos.)	01	NA	NA	NA
2.	M19X1.5P (L = 20mm, T=13nos.)	NA	01	NA	NA

12. Name plate and warning inscription: The name-cum-warning inscription plate and rating plate made of Brass/SS is permanently fixed on the cover of enclosure by hammer driven rivets leaving min. 3mm material thickness below the rivets. The warning inscription shall read as "ISOLATE SUPPLY BEFORE OPENING".

13. Drawing: The unit is designed and constructed as flameproof and weatherproof in accordance with the following drawing conforming to the requirements of IS/IEC 60079-0:2011, IS/IEC 60079-1: 2014 & IS/IEC 60529: 2001 (Reaffirmed 2014).

Sl. No.	Dwg. No.	Title	Rev.	Sheet	Date
1.	KK/DOM/LED/IR/19/01	FLAMEPROOF CUM WEATHERPROOF DOME CAMERA/IR/LED LIGHT ENCLOSURE	0	1 of 4 To 4 of 4	16/05/2019

14. Any other relevant information:

- As per Clause 4.2 Note - 2 of IS/IEC 60079-0:2011 the equipment mark IIB is suitable for application requiring IIA equipment.
- The material of construction of the enclosure may be C10MS/SS instead of die cast aluminum alloy LM-6 construction.
- Equal and equivalent medium class fit NPT threads conforming to requirements of ANSI/ASME B1.20.1 may be used instead of metric threads conforming to ISO 965-1 & 965-2 as per Clause No. 5.3 & 13 of IS/IEC 60079-1:2014.

15. Declaration by the Applicant/Manufacturer:

- As to standards with which the equipment complies in respect of:
  - Electrical equipment for Potentially Explosive atmosphere - General requirements: IS/IEC 60079-0: 2011
  - As to flameproof protection IS/IEC 60079-1: 2014
  - Ingress protection as per IS/IEC 60529: 2001 (Reaffirmed 2014)
- Composition of the cast aluminum alloy LM-6 declared by the manufacturer: Composition of cast aluminum alloy LM-6 purported to be forming the material of construction of the enclosure has been declared by the manufacturer in the

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## परीक्षण रिपोर्ट / TEST REPORT



FORMAT NO.: (CIMFR: DQM: FLP02: F-01:REV-01)  
(Flameproof & Equipment Safety)

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Equipment ID No.: I35/19    ULR No.: TC596220000000210P    Code No. PES/87(B)/19-20

drawing having 7.5% in total of magnesium, titanium and zirconium.  
*However no sample of the alloy was drawn from the prototype enclosure for verifying its chemical composition declared by the manufacturer.*

16. Documents Submitted :
- i) Application form
  - ii) Drawings
  - iii) Prototype/test sample

17. Compliance of prototype or sample with documents: The test sample of electrical equipment submitted for the type tests complies with the manufacturers documents referred above.

18. Condition of sample on receipt: Good

Note: CIMFR has however not checked and tested the compliance of the equipment to any standard other than the above standards.

### SCOPE OF THE TEST CERTIFICATE

The Test Certificate issued by CIMFR testifies that the equipment has been found to comply with the definition of flameproof cum weatherproof EQUIPMENT contained in the relevant Standard specifications. They do not vouch for the quality of the equipment in any other respect.

*This Institute reserves the right to review amend or withdraw this Test Report at any time if considered necessary in the interest of safety.*

*B. K. Mishra*

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Equipment ID No.: 135/19 ULR No.: TC596220000000210F Code No. FES/87(B)/19-20

Test & Assessment Report No.: IN/CIMFR/TR20/

237

Dated: 21 January, 2020

## REPORT OF TEST

Date of Test: 30/08/2019

### Test Equipment Used:

Computer, Kistler Piezo Electric Transducer and Charge Amplifier for conducting Explosion Pressure Tests, Impact test setup, Ingress protection (IP) test setup, Temperature class test setup, Overpressure Test Setup.

Result #A: Tests as per IS/IEC 60079-0: 2011:

Clause	Tests	Remarks	Results (Complies, P- Pass, NA-Not Applicable, F-Fail) References
1	Scope		Complies
2	Normative references		Complies
3	Terms and definitions		Complies
4	Equipment grouping and temperature classification	Gas Group: IIB, IIC, Gb	Complies
5	Temperatures		
5.1.1	Ambient temperature	-20°C to 40°C Amb.	Complies
6	Requirements for all electrical Equipment		Complies
6.6	Electromagnetic and ultrasonic energy radiating equipment		NA
7	Non-metallic enclosures and non-metallic parts of enclosures		NA
7.2	Thermal Endurance		NA
8	Metallic Enclosure and metallic part of Enclosure	Cast aluminium Alloy LM-6 construction	Complies
9	Fasteners		Complies
10	Interlocking devices		NA
11	Bushings		NA
12	Materials used for cementing	Sealing compound = Epoxy Resin+ hardner COT = -20°C to 120°C	Complies
13	Ex components		NA
14	Connection facilities and terminal compartments		NA
15	Connection facilities for earthing or bonding conductors		Complies
16	Entries into enclosures		Complies
17	Supplementary requirements for rotating electrical		NA

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FORMAT NO.: (CIMFR: DQM: FLPO2: F-01:REV-01)  
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Equipment ID No.: 135/19 ULR No.: TC596220000000210F Code No. FES/87(B)/19-20

	machines		
18	Supplementary requirements for switchgear		NA
19	Supplementary requirements for fuses		NA
20	Supplementary requirements for plugs and sockets		NA
21	Supplementary requirements for luminaries		Complies
22	Supplementary requirements for caplights and handlights		NA
23	Equipment incorporating cells and batteries		NA
24	Documentation		Complies
25	Compliance of prototype or sample with documents		Complies
26	Type tests		Complies
26.3	Tests in explosive mixtures		
26.3	Tests for Flameproof (Ex 'd') protection	Verification for Compliance to Ex 'db' requirements as per IS/IEC 60079-1:2014	P/As per Result #B
26.4	Test of enclosures		
26.4.2	Test for resistance to Impact		Complies
26.4.3/2	Drop test		NA
6.4.4		(Not a handheld equipment or portable device)	
26.4.5	Tests for the Degree of protection IP		
26.4.5	IP of equipment	IP-66 Ability to prevent ingress of dust & water - as per IS/IEC 60529:2001 (Reaffirmed 2014)	Complies
26.5	Thermal tests		
26.5.1	Temperature measurement		Complies
26.5.2	Thermal shock test - for glass parts		Complies
26.6	Torque Test for bushings		
26.6	Torque test for bushings		NA
26.7	Tests for non-metallic enclosures or of non-metallic parts of encl.		
26.8	Thermal endurance to heat	Refer Annexure-I	Complies
26.9	Thermal endurance to cold		
26.10	Resistance to light		NA
26.11	Resistance to chemical agents for Gr.I		NA
26.12	Earth continuity test via non-metallic enclosure		NA
26.13	Surface resistance test of parts of enclosures of Non metallic materials		NA
26.14	Charging test		NA
26.15	Measurement of Capacitance		NA
27	Routine verification and tests	Manufacturer's responsibility: Compliance to prototype of the product and physical measurement of gap and flamepath and overpressure at the pressure 1 kg/cm <sup>2</sup> for every sample.	

*After lab*

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FORMAT NO.: (CIMFR: DQM: FLP02: F-01:REV-01)  
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Equipment ID No.: 135/19 ULR No.: TC59622000000210F Code No. FES/87(B)/19-20

28	Manufacturer's responsibility	Conformity of the equipment to the applicable standards	Complies
29	Marking		Ex d IIB 16 Gh
30	Instructions	Instruction related to use, installation, maintenance, adjustment to be provided by the manufacturer along with the equipment.	

Result#A1: 1kg mass of hardened steel has been fallen vertically on the surface of the Ex d enclosure and 16mm thick Toughened Polished glass to create impact energy for group II apparatus. No significant damage was observed.

Result#A2: The surface temperature rise classification of the Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure, designated by Model: KK/DQM/IR/LED/19, Cat. No.: KK/MISC/2019/01 was observed after achieving the equilibrium state with the following lamps energized at 110% of 230V AC/DC supply.

Sl. No	Lamps with rating	Temperature Class at 40° C ambient
1	23W LED	T6

Result#A3: The 16mm thick Toughened Polished glass was subjected to thermal shock test at maximum service temperature.

Result#A4: IP-Protection: Neoprene 'O' ring gasket (04mm thick) is provided at the end of joint for weatherproof IP-66 degree of protection. Tests have been conducted as per IS/IEC 60529:2001 as tabulated below for IP-66 degree of protection.

Sl. No	Type Tests	Results
1.	Dust Test (First Numeral 6) Clause 13.4 & 13.6	No dust had accumulated inside the enclosure in harmful quantity. Pass
2.	Water Test (Second Numeral 6) Clause 14.2.6	No water had accumulated inside the enclosure in harmful quantity. Pass

*[Handwritten Signature]*

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Equipment ID No.: 135/19 ULR No.: TC59622000000210F Code No. PES/87(B)/19-20

Result #B: Tests in explosive mixtures: Tests for type of protection Ex db as per IS/IEC 60079-1:2014.

Type Tests			
Clause No.	Description and relevant tests	Remarks	Result (Complies, P- Pass, NA- Not Applicable, F-Fail) References
1	Scope		Complies
2	Normative references		Complies
3	Terms and definitions		Complies
4	Level of protection (Equipment Protection Level, EPL)	Gas Group IIB, EPL Gb	Complies
5	Flameproof joints	Threaded joint	Complies
6	Sealed joints		Complies
6.1	Cemented joints		Complies
6.1.2	Mechanical strength:		Complies
7	Operating rods		NA
8	Supplementary requirements for shafts and bearings		NA
9	Light transmitting parts		NA
10	Breathing and draining devices which form part of a flameproof enclosure		NA
11	Fasteners and openings		Complies
12	Materials	Cast aluminium Alloy LM-6 construction	Complies
13	Entries for flameproof enclosure		Complies
14	Verification and tests		Complies
15	Type Tests		Complies
15.1	General		Complies
15.2	Tests of ability of the enclosure to withstand pressure		Complies
15.2.1	General		Complies
15.2.2	Determination of Explosion Pressure (Reference Pressure)		P/As per Result #B1
15.2.3	Overpressure Test		P/As per Result #B2
15.3	Test for non-transmission of an internal ignition		Complies
15.3.1	General		Complies
15.3.2	Electrical equipment of Groups IIB		P/As per Result #B3
15.3.3	Electrical equipment of Group IIC		NA
15.4	Tests of flameproof enclosures with breathing and draining devices		NA
15.4.1	General		NA
16	Routine tests	To be conducted by the manufacturer As per Result #B2	Complies
17	Switchgear for Group I		NA
18	Lamp holders and lamp caps		NA
19	Non-metallic enclosures and non-metallic parts of enclosures		NA
19.1	General		NA

*B. K. Saha*



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Equipment ID No.: 135/19 ULR No.: TC59622000000210F Code No. FES/87(B)/19-20

19.2	Resistance to tracking and creepage distances on internal surfaces of the enclosure walls		NA
19.3	Requirements for type test		NA
19.4	Test of erosion by flame		NA
20	Marking		Ex d III T6 Gb
20.2	Caution and warning markings	"ISOLATE SUPPLY BEFORE OPENING"	
21	Instruction	The manufacturer shall supply instruction manual regarding the equipment.	Complies

**Result # B1: Determination of Explosion pressure (Reference Pressure Test) \*:**

Gas mixture: Test with 8% Ethylene in air.

No. of Tests: 3 nos. test with single enclosure.

Test Condition: Enclosure fitted with component and tested as per clause 15.2.2.2

Type of Test	Gas Group	Gas Mixture % in Air		No. of Tests	
Preliminary Test (reference pressure)	II B	8% Ethylene in air		Three	
Test Ref. No.	Ignition	Gauge Position	Max. Pressure in Bar	Time of Pressure rise in millisecond	Remark
Single Enclosure					
PPM/1351901	Body	Body	5.39	17.52	No evidence of distress
PPM/1351902	Body	Body	4.69	20.46	-do-
PPM/1351903	Body	Body	5.31	16.05	-do-

\*Results shown for the pressure-time curve (enclosed) are the highest recorded value obtained in the test.

**Result #B2: Overpressure Test (Static Method):** Hydraulic pressure test is conducted as per Cl. 15.2.3.2 of IS/IEC 60079-1: 2014.

Enclosure	Test reference nos.	Over pressure (kg/cm <sup>2</sup> ) maintained for 10 sec.	Remark
Single Enclosure	OPM/1351904	8.0 kg/cm <sup>2</sup>	No damage or deformation.

**Result #B3: Test for Non transmission of internal ignition:**

Gas Mixture: Test with 37% Hydrogen in air for Gas Gr. II B

No. of Tests: 5 nos. tests with Single enclosure.

Test Condition: Table 12 and 15.3.2.1 (No precompression required)

Name of Enclosure	Test Ref. Nos.	Gas Group	Gas Mixture % in Air	No. of Test	Result
Single Enclosure	EIT/1351905 to EIT/1351909	II B	37 % Hydrogen	Five	Pass

*B. K. Mishra*

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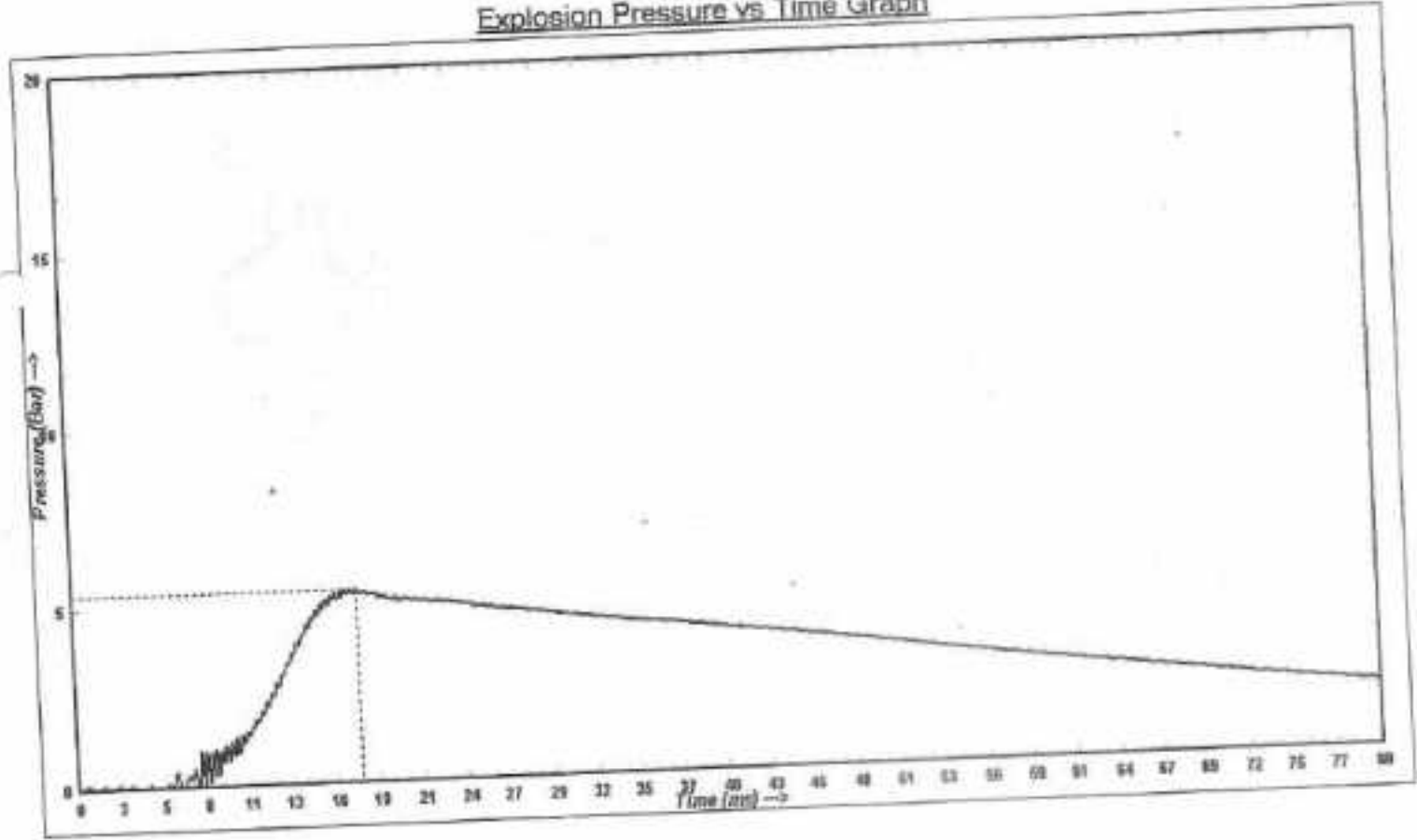
ID Number: <sup>135/19</sup> ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

Test Date: 30/01/2020 प्रमाण पत्र / TEST CERTIFICATE

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- Manufacturer Details : M/S KESHKAMAT & COMPANY
- Manufacturer Address : MUMBAI - 400 30
- Model / Type : MODEL NO. : KK/DM/IR/LED/19
- Category No. : CAT. NO. : KK/M/SC/1019/01
- Gas : ETHYLENE
- Gas Group : IIB
- Equipment Details : FLPWP DOME CAMERA / IR / LED LIGHT ENCLOSURE
- Enclosure Details : SINGLE ENCLOSURE
- Serial / Badge No. : NA
- Peak Pressure : 5.39 Bar at 17.52 ms

Explosion Pressure vs Time Graph



*Bidnyojit Halder*  
20/01/2020  
(Testing Officer)

*[Signature]*  
20/01/2020  
(Discipline Head)

सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान  
CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद्) (Council of Scientific & Industrial Research)

बरवा रोड, धनबाद - 826015, झारखण्ड, भारत / Barwa Road, Dhanbad - 826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण रिपोर्ट / TEST REPORT

मूल प्रति  
ORIGINAL COPY

FORMAT NO.: (CIMFR: DQM: FLP02: F-01:REV-01)

(Flameproof & Equipment Safety)

Equipment ID No.: 135/19 ULR No.: TC596220000000210F Code No. FES/87(B)/19-20

**CONCLUSION:** The Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure, In cast aluminium Alloy LM-6 construction designated by Model: KK/DQM/IR/LED/19, Cat. No.: KK/MISC/2019/01 meets the test requirements for flameproofness as per IS/IEC 60079-1: 2014, general requirements as per IS/IEC 60079-0: 2011, ingress protection (IP-66 degree) as per IS/IEC 60529:2001 (Reaffirmed 2014). Hence, the above mentioned equipment may be used in Gas Group: IIB, Category EPL Gb atmosphere.

Reported By

*Bijayjit Modak*  
20/01/2020

(B. MODAK)  
Tech. Officer

Dated: 20th January, 2020  
Flameproof & Equipment Safety  
CSIR - Central Institute of Mining & Fuel Research,  
Barwa Road, Dhanbad - 826 015,  
(Jharkhand) India

Checked & Approved By

*A. K. Singh*  
20/01/2020

(A. K. SINGH)  
HOS

Flameproof & Equipment Safety

# सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद) / Council of Scientific & Industrial Research

बरवा रोड, धनबाद - 826015, झारखण्ड, भारत / Barwa Road, Dhanbad - 826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा / FLAMEPROOF & EQUIPMENT SAFETY

## परीक्षण रिपोर्ट / TEST REPORT



मूल प्रति  
ORIGINAL COPY

FORMAT NO.: [CIMPR: DQM: FLP02: F-01:REV-01]  
(Flameproof & Equipment Safety)

Equipment ID No.: 135/19 ULR No.: TC596230000000210F Code No. PES/87(B)/19-20

### ANNEXURE-I

Thermal endurance to heat & cold.

Cementing Materials:

- (i) Composition : Epoxy Resin and Hardener
- (ii) Ratio : 1:1 (by volume)
- (iii) Make : Araldite
- (iv) Color : White
- (v) CDT: -20°C to +120°C

Thermal Endurance to Heat test as per Clause No. 26.8 of IS/IEC 60079-0:2011.

Date & Time of test : 10/10/2019 10.00 Hrs. to 10/11/2019 10.00 Hrs.					
Duration	Specified Temp.	Tested Temp.	Specified RH%	Observed RH%	Remarks
4 weeks	Ts<70°C	82 ± 2°C	90 ± 5 %	85%	The maximum service temperature (Ts) of the hottest component at the max. ambient temp. of 40°C is less than 70°C. Hence specified test is conducted at 80±2°C for first 4 weeks.

Thermal Endurance to Cold test as per Clause No. 26.9 IS/IEC 60079-0:2011.

Start Date & Time of test: 11/11/2019 11.00Hrs. to 12/11/2019 11.00 Hrs.		
Duration	Tested Temp.	Remark
24 Hrs	-25°C	The test is conducted at lower temperature, minimum service temperature reduced to -25°C as per 26.7.2.

Visual observations after Endurance to heat and Cold Tests: No change in colour of potting material and development of cracks and no damage or deformation after overpressure test (static method).

*B. K. Saha*  
20/11/2020



सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

CSIR-Central Institute of Mining and Fuel Research

(विज्ञानिक लक्ष्य औद्योगिक अनुसंधान परिषद)

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बरवा रोड, धनबाद-826015, झारखण्ड, भारत

Barwa Road, Dhanbad - 826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा FLAMEPROOF & EQUIPMENT SAFETY

परीक्षण प्रमाण पत्र TEST CERTIFICATE



NABL, Certificate No.: TC-5962

### TYPE EXAMINATION CERTIFICATE

FORMAT NO.: (CIMFR: DQM: FLP02: F-01: REV-01)  
(Flameproof & Equipment Safety)

Certificate No.: CMP 20 INEx 0093  
ULR No.: TC596220000000210F

Dated: 20/01/2020  
(Issue No. 0)

1. Applicant : M/S. KESHKAMAT & COMPANY  
9/129, ADARSH NAGAR, PRABHADEVI,  
MUMBAI - 400 030
2. Manufacturer : Same as above
3. Equipment : Flameproof cam Weatherproof Dome Camera/IR/LID Lighting Enclosure.
4. Designated by : Model: KK/DOM/IR/1,ED/19, Cat. No.: KK/MISC/2019/01.
5. Type of protection : Ex d for Gas Group IIB, EPL Gb.
6. Marking : Ex d IIB T6 Gb.
7. Material of construction : Cast aluminium Alloy LM-6 construction

This certificate is issued as verification that a sample/documentation was assessed and found to comply with the IS/IEC Standard list below. This certificate relates to only design and construction of the equipment. It does not cover requirement related to manufacturing process and usage.

**8. Standard:** The equipment and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

- IS/IEC 60079-0:2011 Explosive atmospheres - Part 0: General requirements.  
IS/IEC 60079-1:2014 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d".

This type test certificate does not indicate compliance with electrical safety and performance requirements other than those expressly included in the standards listed above.

**9. Degree of ingress protection:** IP-66 as per IS IEC:60529:2001 (Reaffirmed 2014)

**10. Test & Assessment Reports:** A sample(s)/documents of the equipment listed have successfully met the examination and test requirements as recorded in IN/CIMFR/TR20/ 237 Dated: 21 January, 2020.



सीएसआईआर-केन्द्रीय खनन एवं ईंधन अनुसंधान संस्थान

CSIR-Central Institute of Mining and Fuel Research

(वैज्ञानिक तथा औद्योगिक अनुसंधान परिषद)  
(Council of Scientific & Industrial Research)

बरवा रोड, धनबाद-826015, झारखण्ड, भारत  
Barwa Road, Dhanbad - 826015, Jharkhand, India

ज्वालासह एवं उपकरण सुरक्षा (FLAMEPROOF & EQUIPMENT SAFETY)  
परीक्षण प्रमाण पत्र / TEST CERTIFICATE



NABL, Certificate No.: TC-5962

### TYPE EXAMINATION CERTIFICATE

Certificate No.: CMP 20 INEx 0093

Dated: 20/01/2020

#### SCHEDULE

11. **Description of equipment:** Flameproof cum Weatherproof Dome Camera/IR/LED Lighting Enclosure, Model: KK/DOM/IR/LED/19, Material of construction: cast aluminium Alloy LM-6 Cat. No.: KK/MISC/2019/01, Rated 23W LED.

Enclosure Type	Volume (in cc).		Dimension (mm) LxBxH	Max. no. of aperture on cover	Temp. Class at ambient 40°C
	Gross/	Nett.			
Single Enclosure	6000	950	Ø300x257mm	One No.	T6

#### 12. Drawing and documents:

Sl. No.	Dwg. No.	Title	Rev.	Sheet No.	Date
1.	KK/DOM/LED/IR/19/01	FLAMEPROOF CUM WEATHERPROOF DOME CAMERA/IR/LED LIGHT ENCLOSURE	0	1 of 4 To 4 of 4	16/05/2019

13. **Routine Testing:** A routine overpressure test in accordance with IS IEC 60079-1:2014 clause 16 shall be carried out at a pressure of 8 Kg/cm<sup>2</sup> for a period of at least 10 seconds and test results must be recorded. The overpressure test shall be considered satisfactory, if no permanent deformation or damage invalidating type of protection is observed, the joints shall in no place have been permanently enlarged and no leakage through the walls of the enclosure is observed.

14. **Specific conditions of use:** Not Applicable.

15. **Details of certificate changes (for issue 1 and above):** Not Applicable.

16. **Additional Information:** Not Applicable.

17. **History:** Not Applicable.

Approved & Issued on behalf of CSIR- CIMR

(Dr. A. K. Singh)  
Chief Scientist & HOS

*This Institute reserves the right to review, amend or withdraw this Type Examination certificate at any time if considered necessary in the interest of safety.*







**NOTE DETAILS >**

FLAMEPROOF CUM WEATHERPROOF JUNCTION BOX FOR CCTV SYSTEM IS MADE AS PER SPECIFICATIONS GIVEN BELOW

- MATERIAL OF CONSTRUCTION - B LHM THE COMPOSITION IS AS GIVEN BELOW.  
 COPPER = 0.1% MAX., MAGNESIUM = 0.1% MAX., IRON = 0.5% MAX., ZINC = 0.1% MAX., LEAD = 0.1% MAX., ANGIENNE = 0.5% MAX., NICKEL = 0.1% MAX., SILICON = 0.1% TO 0.3% MAX., TITANIUM = 0.2% MAX., THE CONSTRUCTION MATERIAL CAN BE S.S.  
 MAGNESIUM CONTENT NOT MORE THAN 6% IN TOTAL OF MAGNESIUM AND TITANIUM BY MASS. SURFACE FINISH - 6.3 MICRONS.

2. JBOX IS MOUNTED AS FLAME PATH ALONG THE THREAD JOINTS AND THE CLEARANCE BETWEEN THE BODY AND COVER IS 48.15mm.  
 NEOPRENE 'O' RING GASKET IS PROVIDED ON THE FLANGE PORTIONS FOR WEATHERPROOFING. THESE ARE ONLY SUPPLEMENT AND DO NOT FORM PART OF FLAMEPROOF JOINTS. ANY DISPLACEMENT CHANGE OF THE GASKET WILL NOT HAMPER FLAMEPROOFNESS OF THE EQUIPMENT.

3. THE MATERIAL THICKNESS AT THE BOTTOM AND AROUND THE TAPERED HOLES IS 3mm.  
 THE LENGTH OF THE TAPERED HOLES IS 240mm.

4. THE ALLEN HEAD SCREWS/BOLTS USED HAVE NIBBLING IN THE LENGTH = 240mm.  
 ONE INSIDE AND TWO OUTSIDE EARTHING SCREWS ARE PROVIDED (SIZE CHANBAD THE EARTHING OF THE JB IS DONE AT INSIDE AND OUTSIDE AS SHOWN (INDIA) THE SCREWS HAVE FIRM THREADS AND NON CONDUCTIVE FLAMEPROOF & EQUIPMENT SAFETY EARTHING CONDUCTOR USED SHALL BE 3mm 2.0mm MIN. DIAMETER.

5. NAME PLATE AND WARNING PLATES MADE OF S.S. MATERIAL ARE PROVIDED. ALL TEST REPORTS ARE PROVIDED WITH HAMMER DRIVE RIVETS.  
 MAX. CABLE ENTRY PORTS AS UNDER  
 1. SIZE M19 x 1.5 PITCH = 1 NO. OR  
 2. SIZE M25 x 1.5 PITCH = 1 NO.

6. WALL THICKNESS IS MOUNTAINED = 15mm MIN.  
 HYDRO TEST PROCEDURE DETAILS:  
 STATD PRESSURE = 10 kg/cm<sup>2</sup> OR 1.0 TIMES TEST PRESSURE WHICHEVER IS GREATER.  
 AIR PRESS PROTECTION = IP 68BT.

7. TOTAL VOLUME OF THE JUNCTION BOX FROM INSIDE JB IN C.C. (CUBIC CENTIMETER) EFFECTIVE ACTUAL VOLUME C.C. INSIDE THE JUNCTION BOX JB IN C.C. WHICH EVER IS GREATER.

MODEL	TOTAL VOLUME C.C.	EFFECTIVE ACTUAL VOLUME C.C.
KK/DOM/LED/19	8,000 C.C.	888 C.C.

8. TEMPERATURE CLASS = T4  
 9. MINIMUM THICKNESS AROUND ALL HOLES FOR EX. 2.0mm MIN.

10. MINIMUM THICKNESS OF THE FLANGE PORTION OF THE TAPERED HOLES IS 3mm.  
 THE TAPERED HOLES ARE PROVIDED ON THE FLANGE PORTION OF THE TAPERED HOLES AS SHOWN. EARLY ENTRY IN TO THE JB. TERMINATION OF EQUIPMENT AND OUTFLOWING ARE MADE ON THE TERMINAL BLOCK ONE.

11. THE NEOPRENE GASKET @ 4mm 'O' RING END, IS USED FOR IP - 68BT PROTECTION. THE GASKET IS EVENLY COMPRESSED TO FULLST BETWEEN THE COVER AND BODY. GASKET RING WILL BE RETAINED WITH COVER.

12. DEPTH OF THREADS AND BOLT ENGAGEMENT IS MAINTAINED AS PER REQUIREMENT OF IS STANDARD.

**BILL OF MATERIAL**

SR. NO.	DESCRIPTION	MATERIAL	QTY.	REMARKS
1	MAIN BODY	LMS	1	
2	FRONT COVER	LMS	1	
3	TOP COVER	LMS	1	
4	TOUGHENED GLASS	GLASS	1	6250 x 10mm THK.
5	GLASS HOLDING RING	LMS	1	
6	FRONT COVER LOCKING SCREW	S.S.	1	M6 x 35 L
7	'O' RING/GASKET / GASKET	NEOPRENE	1	O4 ENDLESS
8	CHEESE HEAD SCREW WITH SPRING WASHERS FOR EARTHING	BRASS	3	M8 x 10 L
9	NAME PLATE	S.S.	1	
10	WARNING PLATE	S.S.	1	
11	TERMINAL BLOCK	CHANNEL CLIP-ON CONNECTOR	1	NON TERMINATING WIRE / CABLE

ALL DIMENSIONS ARE IN mm. TOLERANCE IN OVERALL DIMENSIONS - +0.10mm. EXCEPT FOR FLAME PATH & GAP.

TITLE: FLAMEPROOF CUM WEATHERPROOF COME CAMERA / IR / LED LIGHT ENCLOSURE (FOR GAS GROUP - II B ZONE - 1)

SCALE: KK/DOM/IR/LED/19

IS/IEC: 60079-1 (2014)  
 IS/IEC: 60079-0 (2011)  
 IS/IEC: 60529 (2001)

CAT NO. KK/MISC/2019/01

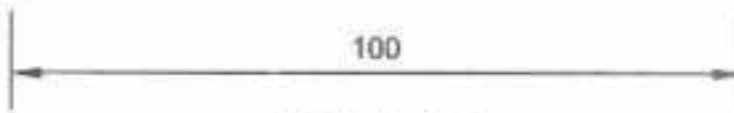
DRG. NO. KK/DOM/LED/IR/19/01

SHEET 5 OF 4

**INSTITUTE OF MINING & FUEL RESEARCH**  
 CHANBAD (INDIA)  
 CERTIFIED WIRE TEST REPORT  
 No. CHANBAD/IR/LED/19/01/237

DATED 21.01.2024  
 Bishwajit Ghosh  
 Testing Officer

 <b>KESHKAMAT &amp; COMPANY</b> B/129, ADVARSHI NAGAR, PRASHADEVI, MUMBAI-400 030, INDIA	
TYPE : FLAMEPROOF CLIM WEATHERPROOF DOME CAMERA / IR / LED LIGHT ENCLOSURE EX "d" II B TB (+20° C TO +40° C) IP-65, T8	MODEL : KK/DOM/IR/LED/19
CAT NO.: KK/MISC/2019/01	SPL. NO.:
DRG. NO.: KK/DOM/LED/IR/19/01	AS PER : IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)
CIMFR CERT. NO.:	
ISOLATE SUPPLY BEFORE OPENING	



**NAME PLATE**  
(ITEM NO. 9)

CENTRAL INSTITUTE OF MINING & FUEL RESEARCH  
 DHANBAD  
 (INDIA)  
 FLAME PROOF & EQUIPMENT SAFETY  
 CERTIFIED WIDE TEST REPORT  
 IN/IEC/19/01/257  
 No. 257  
 DATED 21.01.2020  
 Safety Officer  
 S. K. S.

 <b>WARNING</b> ISOLATE SUPPLY BEFORE OPENING
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**WARNING PLATE**  
(ITEM NO. 10)

ALL DIMENSIONS ARE IN mm.  
TOLERANCE IN OVERALL DIMENSIONS +/-10mm.  
EXCEPT FOR FLAME PATH & GAP

REV. NO.	REV. DATE	CHANGE	APPD.
0	16.05.2019	ORIGINAL	
		DOC. GA DIM mm SCALE N.T.S.	
DRAWN <i>Seemson</i>		CHECKED <i>bl</i>	ENGINEER <i>Shrikant</i>

TITLE : FLAMEPROOF CUM WEATHERPROOF DOME CAMERA / IR / LED LIGHT ENCLOSURE (FOR GAS GROUP - II B ZONE - 1)	
MODEL : KK/DOM/IR/LED/19	
AS PER : IS/IEC: 60079-1 (2014) IS/IEC: 60079-0 (2011) IS/IEC: 60529 (2001)	
CAT NO. KK/MISC/2019/01	SHEET 4 OF 4
DRG. NO. KK/DOM/LED/IR/19/01	SIZE B

KK/DOM/LED/IR/19/01  
 16