

PROJECT

- Construction of following Transmission Line under State Plan against NIT No 23/PRDS/PTCL/2021
- 1 Construction of DCDS 400KV from Husar Thermal Power Plant to Nandpur (EGCL) with twin Moose conductor (RL - 123 KM)
 - 2 Construction of DCDS 220KV from Husar Thermal Power Plant to Nandpur (EGCL) with twin Moose conductor (RL - 90 KM)
 - 3 Construction of DCDS 220KV from Husar Thermal Power Plant to GSR Karamnara with twin Moose conductor (RL - 120 KM)
- 23/Trans/P II/40/2021 Dated 08.12.2021
- Bihar State Power Transmission Company Ltd., Patna

NOA REF. NO.
CLIENT
CONTRACTOR

KEC

KEC INTERNATIONAL LIMITED

Building No. 9A/8th floor, DLF Cyber City, Phase III, Gurgaon-122002, Haryana

**GUARANTEED TECHNICAL PARTICULARS OF COMPOSITE LONG ROD
POLYMER INSULATORS FOR 220KV TRANSMISSION LINE**

Sr. No.	Description	Unit	90 KN		
			120 KN	160 KN	180 KN
1	Name & address of manufacture		OLECTRA GREENTECH LIMITED 1&9, IDA, Phase II, Cherlapally, Hyderabad, India.		
2	Weight of single unit	Kg	6.5 (Approx)	7.3 (Approx)	8.3 (Approx)
3	Size and designation of ball & socket assembly	mm	16B	20	20
4	Core diameter	mm	20	20	24
5	Tolerance on core diameter	mm	±mm	2	2
6	Nominal length (section length)	mm	2030	2175	2380
7	Tolerance on Nominal length	mm	±mm	50	50
8	Dry arcing distance (Minimum)	mm	1800	1906	2080
9	Number of sheds	Nos.	24/46/23	25/48/24	25/48/24
10	Sheds profile (type)		Aerodynamic	Aerodynamic	Aerodynamic
11	Shed spacing	mm	76	76	86
12	Sheds profile (regular alternating)		Alternating	Alternating	Alternating
13	Shed diameter	mm	120/80/96	120/80/96	120/80/96
14	Tolerance on shed diameter	mm	±mm	6/4/5	6/4/5
15	Minimum creepage distance	mm	7595	7595	7595
16	Tolerance on Creepage distance	mm	150	500	200
17	Guaranteed mechanical strength	kN	90	120	160
18	Routine mechanical load	KN	45	60	80
19	Material		ECR grade	ECR grade	ECR grade
	a) FRP rod		Boron free	Boron free	Boron free
	b) Weather sheds with % contents of silicon		30%	30%	30%
	c) Housing		Silicone rubber	Silicone rubber	Silicone rubber
	d) End fittings		Casting/Forged	Casting/Forged	Casting/Forged
20	e) Grading rings		Aluminium	Aluminium	Aluminium
	Minimum thickness of sheath covering over the core	mm	3Min	3Min	3Min
21	Power frequency withstand voltage of single unit				
	a) Dry	KV (rms)	490	490	490
22	b) Wet	KV (rms)	460	460	460
	Power frequency flashover voltage of single unit				
23	a) Dry	KV (rms)	500	500	500
	b) Wet	KV (rms)	480	480	480
24	Impulse withstand voltage of single unit (dry)				
	a) Positive	KV (peak)	1050	1050	1050
25	b) Negative	KV (peak)	1050	1050	1050
	Impulse flashover voltage of single unit (dry)				
26	a) Positive	KV (peak)	1060	1060	1060
	b) Negative	KV (peak)	1060	1060	1060
27	Purity of zinc used for galvanizing end fittings	%	99.95	99.95	99.95
28	Number of dips which the end fittings can withstand in standard preece test	Nos.	6	6	6
29	Certified test report of accelerated ageing test of 5000 hours (enclosed) (appendix-C of IEC-61109)	Yes/No.	Yes	Yes	Yes
30	Drawing enclosed	Yes/No.	Yes	Yes	Yes
31	Confirm, whether the offered long rod insulator shall be suitable for fitting & fixing in the existing transmission lines with disc insulators. Also confirm that no modification in the hardware accessories/ tower structures will be required for replacing the existing disc insulators by the long rod polymer	Yes/No.	Yes	Yes	Yes
	Confirm that the long rod polymer insulators shall be supplied with suitable packing for safe keeping in the store for a longer period without any damage.	Yes/No.	Yes	Yes	Yes

APPROVED

Subject to the condition that you are not absolved of
The responsibility for correctness of the materials
supplied as per specification.

25/3/22
Electrical Superintending Engineer
(Planning and Engineering)
Bihar State Power Transmission Company Limited
Vidyut Bhawan, Patna

PROJECT

- Construction of following Transmission Line under State Plan against NIT No 23/PRB/SPCL/2021.
1. Construction of DCDS 400KV from Buxar Thermal Power Plant to Raubhupur (DGO) with twin Moose conductor (RL - 123 KM)
 2. Construction of DCDS 220KV from Buxar Thermal Power Plant to GBS Karmouasa with twin Moose conductor (RL - 90 KM)
 3. Construction of DCDS 220KV from Buxar Thermal Power Plant to GBS Dehri on single Zebra conductor (RL - 120 KM)

NOA REF. NO.

23/Trans/P 11/10/2021 Dated 08.12.2021

CLIENT

Bihar State Power Transmission Company Ltd., Patna

CONTRACTOR

KEC

KEC INTERNATIONAL LIMITED

Building No. 9A, 8th floor, DLF Cyber City, Phase III, Gurgaon 122002, Haryana

**GUARANTEED TECHNICAL PARTICULARS OF COMPOSITE LONG ROD
POLYMER INSULATORS FOR 400KV TRANSMISSION LINE**

Sr. No.	Description	Unit	120 KN	160 KN
1	Name & address of manufacture		OLECTRA GREENTECH LIMITED 1&9, IDA, Phase II, Cherlapally, Hyderabad, India.	
2	Weight of single unit	Kg	10.5 (Approx)	12.5 (Approx)
3	Size and designation of ball & socket assembly	mm	20	20
4	Core diameter	mm	20	24
5	Tolerance on core diameter	±mm	2	2
6	Nominal length (section length)	mm	3135	3910
7	Tolerance on Nominal length	±mm	50	50
8	Dry arcing distance (Minimum)	mm	3050	3520
9	Number of sheds	Nos.	41/80/40	42/82/41
10	Sheds profile (type)		Aerodynamic	Aerodynamic
11	Shed spacing	mm	76	86
12	Sheds profile (regular alternating)		Alternating	Alternating
13	Shed diameter	mm	120/80/96	120/80/96
14	Tolerance on shed diameter	±mm	6/4/5	6/4/5
15	Minimum creepage distance	mm	13020	13020
16	Tolerance on Creepage distance	mm	200	350
17	Guaranteed mechanical strength	kN	120	160
18	Routine mechanical load	KN	60	80
19	Material			
	a) FRP rod		ECR grade Boron free	ECR grade Boron free
	b) Weather sheds with % contents of silicon		30%	30%
	c) Housing		Silicone rubber	Silicone rubber
	d) End fittings		Casting/Forged	Casting/Forged
20	e) Grading rings		Aluminium	Aluminium
	Minimum thickness of sheath covering over the core	mm	3Min	3Min
21	Power frequency withstand voltage of single unit			
	a) Dry	KV (rms)	750	750
22	b) Wet	KV (rms)	680	680
	Power frequency flashover voltage of single unit			
23	a) Dry	KV (rms)	820	820
	b) Wet	KV (rms)	750	750
24	Impulse withstand voltage of single unit (dry)			
	a) Positive	KV (peak)	1550	1550
25	b) Negative	KV (peak)	1550	1550
	Impulse flashover voltage of single unit (dry)			
26	a) Positive	KV (peak)	1600	1600
	b) Negative	KV (peak)	1600	1600
27	Purity of zinc used for galvanizing end fittings	%	99.95	99.95
28	Number of dips which the end fittings can withstand in standard prece test	Nos.	6	6
29	Certified test report of accelerated ageing test of 5000 hours (enclosed) (appendix-C of IEC-61109)	Yes/No.	Yes	Yes
30	Drawing enclosed	Yes/No.	Yes	Yes
31	Confirm, whether the offered long rod insulator shall be suitable for fitting & fixing in the existing transmission lines with disc insulators. Also confirm that no modification in the hardware accessories/ tower structures will be required for replacing the existing disc insulators by the long rod polymer insulators.	Yes/No.	Yes	Yes
32	Confirm that the long rod polymer insulators shall be supplied with suitable packing for safe keeping in the store for a longer period without any damage.	Yes/No.	Yes	Yes

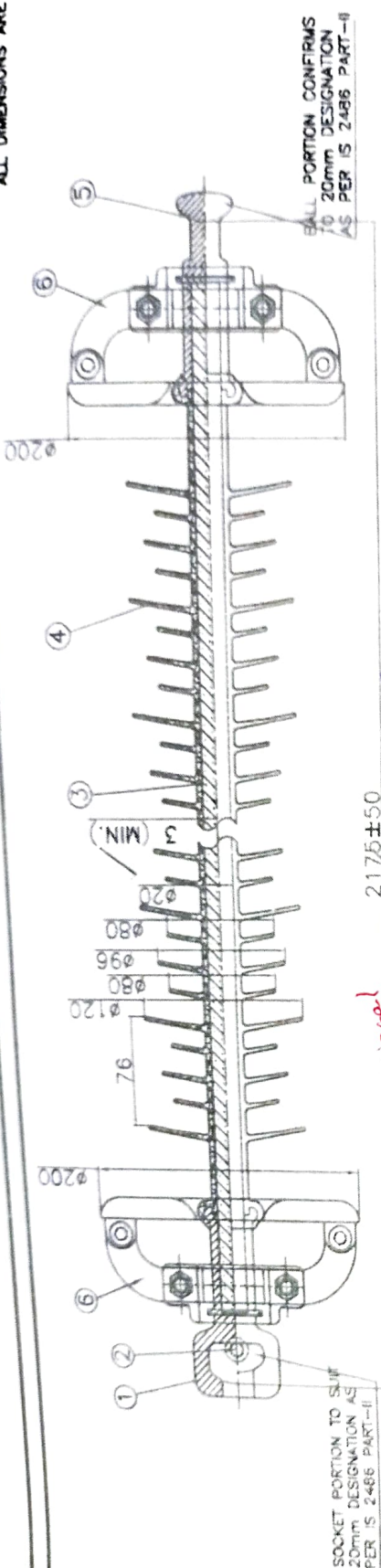
APPROVED

Subject to the condition that you are not absolved of the responsibility for correctness of the materials supplied as per specification

Electrical Superintending Engineer
(Planning and Engineering)
Bihar State Power Transmission Company Limited
Vidyut Bhawan, Patna-800021

25.03.2022

ALL DIMENSIONS ARE IN "mm"



BALL PORTION CONFIRMS
70 20mm DESIGNATION
AS PER IS 2436 PART-4

SOCKET PORTION TO SLIP
20mm DESIGNATION AS
PER IS 2486 PART-II

2175±50

APPROVED

* No. of studs shall be as per T+R

APPROVED

Subject to the condition that you are not absolved of the responsibility for correctness of the materials supplied as per specification.

* All dimensions and parameters shall be valid

Electrical Superintending Engineer
(Planning and Engineering)

Bihar State Power Transmission Company Limited
Bhadrachalam, Patna-800021

nm 1999-20

MECHANICAL CHARACTERISTICS:		
1. SPECIFIED MECHANICAL LOAD	KN	120
2. ROUTINE TEST LOAD	KN	60

ELECTRICAL CHARACTERISTICS:	
1. NOMINAL SYSTEM VOLTAGE	kV 220
2. HIGHEST SYSTEM VOLTAGE	kV 245
3. SYSTEM FREQUENCY	Hz 50
WET 1 MINUTE POWER FREQUENCY WITHSTAND VOLTAGE	kV(rms) 480
DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE	kVp 1050
CORONA EXTINCTION VOLTAGE	kV(rms) 154

APPLICABLE STANDARDS
• INSULATOR
GALVANISATION
IEC: 61109--2008
IS: 2633-1986

EC: 61109-2008
IC: 2633-1086

REV	DATE	REV	DATE	REV	DATE	REV	DATE
	ALT.BY		ALT.BY		ALT.BY		ALT.BY
APP.BY		APP.BY		APP.BY		APP.BY	

NOTES: CHUCK MACHINES BY PIN MARKING/LASER MARKING ON SOCKET FITTING/SHED

5. GALVANISATION CONFORMS TO IS: 2832-1960, 2833-1962, 8745-1960
6. MASS OF ZINC COATING SHALL BE 80gms/m² MIN
7. PURITY OF ZINC USED SHALL BE 99.99%
8. TOLERANCE ON DIMENSIONS AS PER STANDARD EC: 81/109
9. SILICON CONTENT FOR WEATHER SHEETS AND HOUSING $\geq$ 0.1% BY WEIGHT
10. MIN. THICKNESS OF SHEATH COVERING OVER THE CORE=3mm
11. BALL AND SOCKET DESIGNATION =30mm

[illegible]

5

REL.NO	GRADING RING	AL' ALLOY	2 NO'S		
6	BALL FITTING	FORGED STEEL	1 NO		H.D.G
5	POLYMER HOUSING	SILICONE RUBBER	—		
4	CORE ROD	FIBREGLASS	1 NO		
3	SECURITY CLIP(R)	STAINLESS STEEL	1 NO		
2	SOCKET FITTING	SSCI/FORGED STEEL	1 NO		H.D.G
1	DESCRIPTION	MATERIAL	QTY	DRG.NO	REMARKS

CUSTOMER REF:

TYPE:

**220kV-120kN COMPOSITE SILICONE
RUBBER LONG ROD TENSION
INSULATOR**

ELECTRA GREENTECH LIMITED DRG NO.

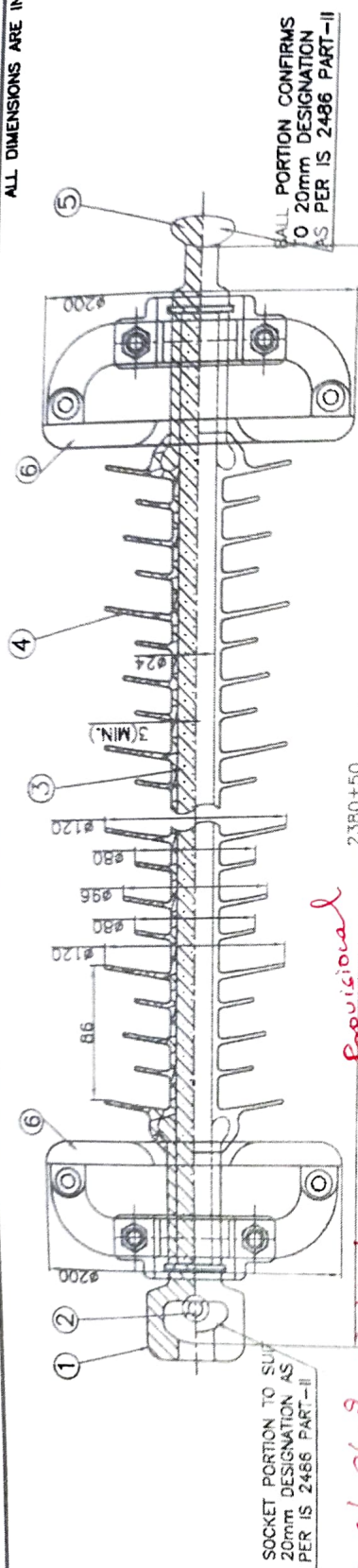
01-21-LF

PLOT NO:1&9. PHASE-II, IDA CHERLAPPALLY. 7505-3

HYDERABAD - 500051, TELANGANA, INDIA



ALL DIMENSIONS ARE IN "MM"



SOCKET PORTION TO SUPPLY
20mm DESIGNATION AS
PER IS 2486 PART-II

* No. of Sheets shall be as per Type test report.

* All dimensions and parameters shall be valid only after successful GUARANTEED TECHNICAL PARTICULARS: type test

Electrical Superintending Engineer
(Planning and Engineering)

Bihar State Power Transmission Company Limited
7595
Mridul Prasad, Patna-800021

GUARANTEED TECHNICAL PARTICULARS: *type test*

DIMENSIONS:

1. MINIMUM CREEPAGE DISTANCE
2. ARCING DISTANCE (MINIMUM)
3. COUPLING DESIGNATION IEC:601

3. COUPLING DESIGNATION IEC:60120/S:2486

MECHANICAL CHARACTERISTICS:		
1. SPECIFIED MECHANICAL LOAD	KN	160
2. ROUTINE TEST LOAD		

ELECTRICAL CHARACTERISTICS:

1. NOMINAL SYSTEM VOLTAGE
2. HIGHEST SYSTEM VOLTAGE
3. SYSTEM FREQUENCY
4. WET 1 MINUTE POWER FREQUENCY WITHSTAND VOLTAGE
5. DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE
3. VISIBLE DISCHARGE VOLTAGE

APPLICABLE STANDARDS
1. INSULATOR

1. INSULATOR	IEC: 61109--2008
2. GALVANISATION	IS: 2653--1986

REV	DATE	REV	DATE	REV	DATE	REV	DATE
	ALT.BY		ALT.BY		ALT.BY		ALT.BY

APP.BY	APP.BY	APP.BY	APP.BY	APP.BY
--------	--------	--------	--------	--------

APP.BY	APP.BY	APP.BY	APP.BY
--------	--------	--------	--------

NOTES: 1. FOLLOWING MARKINGS BY PIN MARKING/LASER MARKING ON SOCKET FITTING/SHEED
DATE MONTH & YEAR
S 22/04/18/2014

3. GALVANISATION CONFORMS TO IS: 2828-1990, 2833-1992, 8740-1990
4. MASS OF ZINC COATING SHALL BE 600gm/sq.m MIN
5. PURITY OF ZINC USED SHALL BE 99.95%
6. TOLERANCE ON DIMENSIONS AS PER STANDARD IE: 61109
7. SILICON CONTENT FOR WEATHER SHEDS AND HOUSING > OR=30% BY WEIGHT
8. MIN. THICKNESS OF SHEATH COVERING OVER THE CORE=3mm
9. BALL AND SOCKET DESIGNATION=20mm

PROJECT Construction of Bounding Transmission Line under Phase II, against MIT No. 217/1983/PC/2/2011
NOA REF. NO. 10228-GEN/2010 from Baur Thermal Power Plant to Baur Thermal (BCT) with two more conductors (345 - 40 kV)
CLIENT 1. Construction of BCT to Baur Thermal Power Plant
 2. Construction of 10KV/2.2KV from Baur Thermal Power Plant to Baur Thermal Power Plant in 1925 kWh in four with single phase substation (345 - 40 kV)
DATE 21/05/2011/11/04/2014 Dated 08.12.2012
FILE NO. 10228-GEN/2010/2014 Dated 08.12.2012
FILED 10228-GEN/2010/2014 Dated 08.12.2012
CONTRACTOR MZ INTERNATIONAL LIMITED
 Building No. 9A/2, Phase II, Gurgaon - 122002, Gurgaon

6	GRADING RING	AL'ALLOY	2 No's	
5	BALL FITTING	FORGED STEEL	1 NO	
4	POLYMER HOUSING	SILICONE RUBBER	—	H.D.G.
3	CORE ROD	FIBREGLASS	1 NO	
2	SECURITY CLIP(R)	STAINLESS STEEL	1 NO	
1	SOCKET FITTING	SGGI/FORGED STEEL	1 NO	H.D.G.
SL.NO	DESCRIPTION	MATERIAL	QTY	DRG.NO
CUSTOMER REF: _____ PROJ: _____				

TITLE:	220KV-160KN COMPOSITE SILICONE RUBBER LONG ROD TENSION INSULATOR	DATE	11-09-2021
		DRAWN	G.ASHOK
		CHECKED	K.WADHU
		APPROVED	Y.SUNDAR

	ELECTRA GREENTECH LIMITED DRG NO.		REV
	(FORMERLY GOLDSTONE INFRATECH LIMITED) PLOT NO-149, PHASE-II, IDA CHERLAPALLY, HYDERABAD-500031, TELANGANA		0
01-21-LR-220-160 -7595-3150(T)			

✓ 14



APPROVED
Subject to the condition that you accept
the responsibility for correctness
as per specification

Dr. J. K. Singh
Technical Superintending
Planning and Engines
Maha: P. B. Power Transmission Co.
Vidyal Bhawan, Patna-8
SK

APPROVAL
Subject to the condition that you accept
the responsibility for correctness
as per specification *put*
Technical Superintending
Planning and Engines
Maha: P. Power Transmission Co.
Vidhut Bhawan, Patna-8
SK

APPROVED
Subject to the condition that you accept
the responsibility for correctness
as per specification

Dr. J. K. Singh
Technical Superintending
Planning and Engines
Maha: P. B. Power Transmission Co.
Vidyal Bhawan, Patna-8
SK

APPROVED
Subject to the condition that you accept
the responsibility for correctness
as per specification

Dr. J. K. Singh
Technical Superintending
Planning and Engines
Maha: P. B. Power Transmission Co.
Vidyal Bhawan, Patna-8
SK

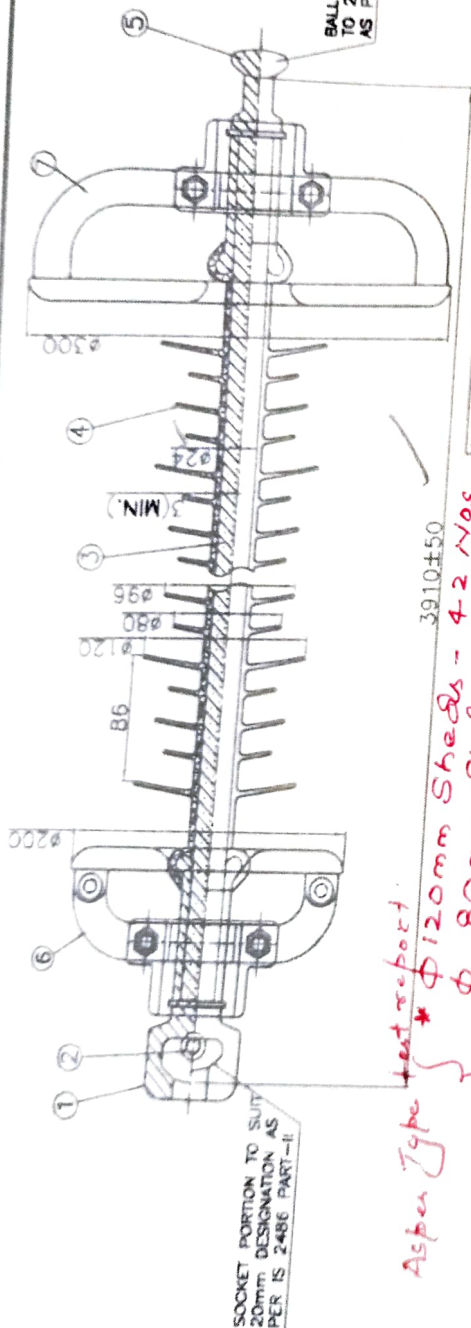
APPROVED
Subject to the condition that you accept
the responsibility for correctness
as per specification

Dr. J. K. Singh
Technical Superintending
Planning and Engines
Maha: P. B. Power Transmission Co.
Vidyal Bhawan, Patna-8
SK

APPROVED
Subject to the condition that you accept
the responsibility for correctness
as per specification

Dr. J. K. Singh
Technical Superintending
Planning and Engines
Maha: P. B. Power Transmission Co.
Vidyal Bhawan, Patna-8
SK

ALL DIMENSION ARE IN "mm"



Aspen Type test report

$\phi 120\text{mm}$ Sheds - 42 Nos.

$\phi 80\text{mm}$ Sheds - 82 Nos.

$\phi 96\text{mm}$ Sheds - 41 Nos.

GUARANTEED TECHNICAL PARTICULARS:

- DIMENSIONS:
1. MINIMUM CREEPAGE DISTANCE mm 13020
 2. ARcing DISTANCE BETWEEN GRADING RINGS (MINIMUM) mm 3520
 3. COUPLING DESIGNATION IS:2486 PART 2/IEC:120 mm 20

MECHANICAL CHARACTERISTICS:

1. SPECIFIED MECHANICAL LOAD
 2. ROUTINE TEST LOAD
- | LOAD | KN |
|------|----|
| 160 | 80 |

ELECTRICAL CHARACTERISTICS:

1. NOMINAL SYSTEM VOLTAGE KV 400
2. HIGHEST SYSTEM VOLTAGE KV 420
3. SYSTEM FREQUENCY HZ 50
4. WET 1 MINUTE POWER FREQUENCY WITHSTAND VOLTAGE KV(rms) 680
5. DRY LIGHTNING IMPULSE WITHSTAND VOLTAGE KVp 1550
6. RIV AT 1MHZ FOR PHASE TO EARTH VOLTAGE (RMS) UNDER DRY CONDITION (MAX) KV 1000
7. WET SWITCHING IMPULSE WITHSTAND VOLTAGE KVp 1050
8. CORONA EXTINCTION VOLTAGE UNDER DRY CONDITION (PHASE TO EARTH) KV(rms) 320
9. THE INSULATOR SHALL WITHSTAND 160kG/m² NaCl SALINITY LEVEL AT 24KV(RMS) PHASE TO EARTH VOLTAGE

APPLICABLE STANDARDS

1. INSULATOR IEC: 61109-2008
2. GALVANISATION IS: 2633-1986

REV	DATE	REV	DATE	REV	DATE	REV	DATE
ALT.BY	ALT.BY	ALT.BY	ALT.BY	ALT.BY	ALT.BY	ALT.BY	ALT.BY

REV/DATE

REV/DATE

REV/DATE

REV/DATE

REV/DATE

REV/DATE

APP.BY

APP.BY

APP.BY

APP.BY

APP.BY

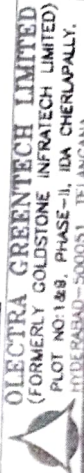
APP.BY

APP.BY

APP.BY

APP.BY

APP.BY



OLECTRA GREENTECH LIMITED
(FORMERLY GOLDSTONE INFRA TECH LIMITED)
PLOT NO:1&8, PHASE-II, IDA CHERUAPALLY,
HIDDEBARAD-500051, TELANGANA

TITLE: 400KV-180KN COMPOSITE SILICONE RUBBER LONG ROD TENSION INSULATOR

SCALE NTS

DATE 17-03-2021

DRAWN G.ASHOK

CHECKED K.MADHU

APPROVED Y.SUNDARRAJU

DRG NO.

01-21-LR-400-160

-13020-3133(T)

REV 0

NOTES:

1. FOLLOWING MARKINGS BY PIN MARKING/LASER MARKING ON SOCKET
2. GALVANISATION CONFORMS TO IS: 2633-1986, 2633-1992, 8745-1990
3. MASS OF ZINC COATING SHALL BE 810gm/m² MIN
4. PURITY OF ZINC USED SHALL BE 99.95%
5. TOLERANCE ON DIMENSIONS AS PER STANDARD IEC: 81109
6. SILICON CONTENT FOR WEATHER SHEDS AND HOUSING > 0R-00% BY WEIGHT
7. MIN THICKNESS OF SHEATH COVERING OVER THE CORE-3mm
8. BALL AND SOCKET DESIGNATION-20mm

Subject to the condition that you are not absolve the responsibility for correctness of the material supplied as per specification

Electrical Superintending Engineer (Planning and Engineering) Bihar State Power Transmission Company Ltd. Patna-800014

Approved by: [Signature]

Approved by: [Signature]

Approved by: [Signature]

Approved by: [Signature]