



GRAPHITE INDIA LIMITED

GRAPHITE ELECTRODE BROCHURE

I) STANDARD NOMINAL LENGTH, DIAMETER TOLERANCE & NIPPLE SIZES :

ELECT. NOM. DIAMETER (mm)	STANDARD NIPPLE SIZE				DIAMETER TOLERANCE		NOMINAL LENGTH SUPPLIED (mm)
	4 T.P.I. NIPPLE		3 T.P.I. NIPPLE		Maximum (mm)	Minimum (mm)	
	Dia	Length (mm)	Dia	Length (mm)			
	(mm)		(mm)				
750	406.4	609.6	-	-	765	759	2700 , 3000
700	374.65	558.8	-	-	714	708	2700, 3000
650	374.65	558.8	-	-	663	657	2400, 2700, 3000
600	317.5	457.2	-	-	613	607	2100, 2400, 2700, 3000
550	298.45	457.2	298.45	372.5	562	556	2100, 2400, 2700
500	269.88	457.2	273.05	355.6	511	505	1800, 2100, 2400, 2700
450	241.3	304.8	241.3	338.7	460	454	1800, 2100, 2400
400	222.25	304.8	215.9	304.8	409	403	1500, 1800, 2100, 2400
350	203.2	254	215.9	304.8	357	352	1500, 1800, 2100, 2400
300	177.8	215.9	177.17	270.9	307	302	1500, 1800, 2100
250	152.4	190.5	155.58	220.1	256	251	1500, 1800
225	139.7	177.8	-	-	230	225	1500, 1800
200	122.24	177.8	-	-	205	200	1200, 1500, 1800
175	107.95	165.1	-	-	179	174	1200, 1500, 1800
150	92.08	139.7	-	-	154	149	1200, 1500, 1800

*Low spot on dia will be as per IEC / NEMA limits

II) LENGTH TOLERANCE:

NOMINAL LENGTH (mm)	FULL LENGTH (mm)		NOMINAL LENGTH (mm)	FULL LENGTH (mm)	
	Maximum	Minimum		Maximum	Minimum
3000	3250	2900	1800	1975	1700
2700	2895	2540	1500	1650	1400
2400	2575	2275	1200	1350	1100
2100	2275	1975	1000	1050	925

EACH SHIPMENT MAY CONTAIN UPTO 15 % SHORT LENGTH ELECTRODES HAVING LENGTH UPTO 150 MM BELOW FULL LENGTH MINIMUM LIMIT.

Notes:

- Commonly used nominal lengths & Nipple Sizes are mentioned here. Specific sizes can be supplied as per request.
- Nipples for GE of dia 250 mm & above are supplied with pitch plug unless specified otherwise.
- Dia 350 mm & above GE are prefitted with nipple prior to dispatch unless specified otherwise.
- All nipples are supplied with Dust Slots unless specified otherwise.

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I) STANDARD NOMINAL LENGTH, DIAMETER TOLERANCE & NIPPLE SIZES :

ELECT. NOM. DIAMETER (mm)	STANDARD NIPPLE SIZE				DIAMETER TOLERANCE		NOMINAL LENGTH SUPPLIED (mm)
	4 T.P.I. NIPPLE		3 T.P.I. NIPPLE		Maximum (mm)	Minimum (mm)	
	Dia	Length	Dia	Length			
	(mm)	(mm)	(mm)	(mm)			
750	406.4	609.6	-	-	765	759	2700 , 3000
700	374.65	558.8	-	-	714	708	2700, 3000
650	374.65	558.8	-	-	663	657	2400, 2700, 3000
600	317.5	457.2	-	-	613	607	2100, 2400, 2700, 3000
550	298.45	457.2	298.45	372.5	562	556	2100, 2400, 2700
500	269.88	457.2	273.05	355.6	511	505	1800, 2100, 2400, 2700
450	241.3	304.8	241.3	338.7	460	454	1800, 2100, 2400
400	222.25	304.8	215.9	304.8	409	403	1500, 1800, 2100, 2400
350	203.2	254	215.9	304.8	357	352	1500, 1800, 2100, 2400
300	177.8	215.9	177.17	270.9	307	302	1500, 1800, 2100
250	152.4	190.5	155.58	220.1	256	251	1500, 1800
225	139.7	177.8	-	-	230	225	1500, 1800
200	122.24	177.8	-	-	205	200	1200, 1500, 1800
175	107.95	165.1	-	-	179	174	1200, 1500, 1800
150	92.08	139.7	-	-	154	149	1200, 1500, 1800

*Low spot on dia will be as per IEC / NEMA limits

II) LENGTH TOLERANCE:

NOMINAL LENGTH	FULL LENGTH (mm)		NOMINAL LENGTH	FULL LENGTH (mm)	
(mm)	Maximum	Minimum	(mm)	Maximum	Minimum
3000	3250	2900	1800	1905	1700
2700	2895	2540	1500	1600	1400
2400	2515	2275	1200	1250	1100
2100	2210	1975	1000	1050	925

EACH SHIPMENT MAY CONTAIN UPTO 8 % SHORT LENGTH ELECTRODES HAVING LENGTH UPTO 150 MM BELOW FULL LENGTH MINIMUM LIMIT.

Notes :

- Commonly used nominal lengths & Nipple Sizes are mentioned here. Specific sizes can be supplied as per request.
- Nipples for GE of dia 250 mm & above are supplied with pitch plug unless specified otherwise.
- Dia 350 mm & above GE are prefitted with nipple prior to dispatch unless specified otherwise.
- All nipples are supplied with Dust Slots unless specified otherwise.



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GRAPHITE ELECTRODE BROCHURE

I) STANDARD NOMINAL LENGTH, DIAMETER TOLERANCE & NIPPLE SIZES :

ELECT. NOM. DIA (inch)	STANDARD NIPPLE SIZE				DIAMETER TOLERANCE		NOMINAL LENGTH SUPPLIED (inch)
	4 T.P.I. NIPPLE		3 T.P.I. NIPPLE				
	Dia	Length	Dia	Length	Maximum	Minimum	
	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	
30	16.00	24.00	-	-	30.12	29.88	110 , 120
28	14.75	22.00	-	-	28.11	27.87	110 , 120
26	14.75	22.00	-	-	26.10	25.87	96, 110 , 120
24	12.50	18.00	-	-	24.13	23.90	84, 96, 110 , 120
22	11.75	18.00	11.75	14.67	22.13	21.89	84, 96, 110
20	10.63	18.00	10.75	14.00	20.12	19.88	72, 84, 96, 110
18	9.50	12.00	9.50	13.33	18.11	17.87	72, 84, 96
16	8.75	12.00	8.50	12.00	16.10	15.87	60, 72, 84, 96
14	8.00	10.00	8.50	12.00	14.06	13.86	60, 72, 84, 96
12	7.00	8.50	6.98	10.67	12.09	11.89	60, 72, 84
10	6.00	7.50	6.13	8.67	10.08	9.88	60, 72
9	5.50	7.00	-	-	9.06	8.86	60, 72
8	4.81	7.00	-	-	8.07	7.87	48, 60, 72
7	4.25	6.50	-	-	7.05	6.85	48, 60, 72
6	3.63	5.50	-	-	6.06	5.87	48, 60, 72

*Low spot on dia will be as per IEC / NEMA limits

II) LENGTH TOLERANCE:

NOMINAL LENGTH (inch)	FULL LENGTH (inch)		NOMINAL LENGTH (inch)	FULL LENGTH (inch)	
	Maximum	Minimum		Maximum	Minimum
120	128	114	84	87	78
110	114	100	72	75	67
96	99	90	60	63	55
84	87	78	48	49	43

EACH SHIPMENT MAY CONTAIN UPTO 8 % SHORT LENGTH ELECTRODES HAVING LENGTH UPTO 6'' BELOW FULL LENGTH MINIMUM LIMIT.

Notes :

- Commonly used nominal lengths & Nipple Sizes are mentioned here. Specific sizes can be supplied as per request.
- Nipples for GE of dia 250 mm & above are supplied with pitch plug unless specified otherwise.
- Dia 350 mm & above GE are prefitted with nipple prior to dispatch unless specified otherwise.
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TYPICAL PROPERTIES - ELECTRODES

Diameter	Grade	Piece A.D (gm / cc)	Piece SPR (ohm.m x 10 ⁻⁶)	MOR (Kg / cm ²)	MOE (Kg / mm ²)	CTE (x10 ⁻⁶ /°C) @600 °C
600 - 750	UHP-DCF	1.72 - 1.80	3.8 - 4.8	120 - 150	900 - 1500	0.5 - 1.5
650 - 750	UHP-ACF	1.69 - 1.75	4.0 - 5.0	100 - 130	900 - 1500	0.7 - 1.7
550 - 600	RP	1.56 - 1.63	6.0 - 7.5	80 - 110	700 - 1200	1.5 - 3.0
	HP	1.67 - 1.74	5.2 - 6.2	90 - 130	800 - 1400	1.5 - 3.0
	UHP-ACF	1.69 - 1.75	4.5 - 5.2	100 - 130	900 - 1500	0.8 - 1.8
450 - 500	RP	1.56 - 1.63	6.0 - 7.5	80 - 110	700 - 1200	1.5 - 3.0
	HP	1.67 - 1.74	5.3 - 6.5	90 - 130	800 - 1400	1.5 - 3.0
	SHP	1.68 - 1.74	5.0 - 5.8	90 - 130	900 - 1500	1.3 - 2.6
	UHP	1.68 - 1.74	4.8 - 5.4	90 - 130	900 - 1500	1.0 - 2.2
300 - 400	RP	1.56 - 1.63	6.5 - 8.5	80 - 110	700 - 1200	1.5 - 3.0
	HP	1.65 - 1.72	5.5 - 6.8	90 - 130	800 - 1400	1.5 - 3.0
	SHP	1.68 - 1.74	5.0 - 5.8	90 - 130	900 - 1500	1.3 - 2.6
	UHP	1.68 - 1.74	4.8 - 5.4	90 - 130	900 - 1500	1.0 - 2.2
150 - 250	RP	1.56 - 1.63	6.5 - 8.5	80 - 110	700 - 1200	1.5 - 3.0
	HP	1.68 - 1.74	5.5 - 7.0	130 - 160	800 - 1400	1.5 - 3.0
	UHP	1.70 - 1.75	5.0 - 6.0	130 - 160	900 - 1500	1.0 - 2.2

TYPICAL PROPERTIES - NIPPLES

Electrode		Corresponding Nipple Properties				
Dia in mm	Grade	A.D. (gm / cc)	SPR (ohm.m x 10 ⁻⁶)	MOR (Kg / cm ²)	MOE (Kg / mm ²)	CTE (x10 ⁻⁶ /°C) @600 °C
650 - 750	UHP-ALL	1.83 - 1.88	2.8 - 3.8	240 - 300	2150 - 2700	0.5 - 1.3
600	UHP-DCF	1.83 - 1.88	2.8 - 3.8	240 - 300	2150 - 2700	0.5 - 1.3
550 - 600	UHP/HP	1.80 - 1.86	3.0 - 4.0	220 - 280	2150 - 2700	0.8 - 1.5
350 - 500	UHP/SHP/HP	1.78 - 1.84	3.2 - 4.2	200 - 280	2050 - 2600	1.0 - 2.0
150-300	HP	1.74 - 1.82	3.7 - 4.7	180 - 230	1500 - 2000	1.5 - 2.5
150 - 600	RP	1.70 - 1.80	3.7 - 4.7	150 - 200	1200 - 1900	1.5 - 2.5

- Real Density 2.20- 2.23 gm/cc for all grades
- Ash Content – UHP - 0.2%, SHP – 0.35% & HP/RP – 0.5%
- Typical properties may be altered by GIL without notice.



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CURRENT CARRYING CAPACITIES (KA) - ELECTRODES

Dia. (mm)	RP	HP	SHP	UHP-ACF	UHP-DCF
	Typical Range in KA				
750	NA	NA	NA	90 - 120	100 - 135
700	NA	NA	NA	80 - 110	90 - 120
650	NA	NA	NA	68 - 90	75 - 105
600	32 - 50	40 - 64	NA	50 - 80	60 - 90
550	29 - 45	36 - 56	NA	45 - 70	NA
500	26 - 41	32 - 51	36 - 54	40 - 64	NA
450	22 - 35	27 - 44	30 - 48	34 - 55	NA
400	18 - 30	22 - 37	24 - 40	28 - 47	NA
350	13 - 24	16 - 30	18 - 33	20 - 38	NA
300	11 -.19	14 - 24	16 - 27	18 - 30	NA
250	8 -.14	10 -.17	NA	13 -.22	NA
225	6 -.11	8 -.14	NA	10 -.18	NA
200	5 -.9	6 -.11	NA	8 -.14	NA
175	4 -.7	5 -.9	NA	NA	NA
150	3 -.5	4 -.7	NA	NA	NA

Note : RP & HP grades in dia 550/600 mm are made for special applications.

RECOMMENDED TIGHTENING TORQUE

Electrode Size		Max. Tightening Torque	
Inches	MM	N-m	Ft-Lbs
14	350	825	610
16	400	1075	800
18	450	1475	1075
20	500	2200	1625
22	550	2850	2100
24	600	3800	2800
26	650	4600	3375
28	700	5700	4200
30	750	7400	5450