National Electrical Manufacturers Association
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PROPOSED, NEW AND REVISED STANDARDS

TO ALL REPRESENTATIVES OF MEMBER COMPANIES
IN THE MANUFACTURED GRAPHITE SECTION

Subject: Revision No. **4** to the NEMA Standard Publication for *Manufactured Graphite Electrodes*, NEMA Pub. No. **CG 1-1982 (R 1985,1987)**

Dear Representative:

Revision No.**4**, consisting of Figure 2-7 dated September 1988, is enclosed for insertion in your copy of the subject publication. Also enclosed is a new title page and table of contents to show that your book now contains Revision Nos. 1, 2, 3, and 4. To bring your copy of CG 1 up to date, please insert the attached revised pages in their proper place in the publication and delete the pages they replace.

Please insert these pages carefully since extra copies are not available.

Sincerely,

Krystyna A. McIver
Standards Publications Editor

Encl: Revision No. **4** to CG 1-1982
Copies to: All Known Holders of CG 1

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CG 1-82 6470247 0000631 3 G-45-19

STANDARDS PUBLICATION/NO. CG 1

nema

Manufactured Graphite Electrodes

NEMA

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION ■ 2101 L STREET, N.W., WASHINGTON, D.C. 20037

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NEMA CG 1-1982 (R 1985, 1987)

CG 1

MANUFACTURED GRAPHITE ELECTRODES

Revision No. 1—February 1984
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Revision No. 4—September 1988

Published by

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MANUFACTURED GRAPHITE ELECTRODES

Foreword

User needs were considered in the development of this Standards Publication by the Manufactured Graphite Section of the National Electrical Manufacturers Association. The Section will periodically review it for any revisions necessary to keep it up to date with advancing technology. Proposed or recommended revisions should be submitted to:

Manager, Engineering Department
National Electrical Manufacturers Association
2101 L Street. N.W.
Washington, D.C. 20037

* * *

NEMA Standards Publication No. CG 1-1982 revises and supersedes CG 1-1980.

Scope

Section 1 of this Standards Publication covers lengths and diameters of cylindrical manufactured graphite electrodes for use in all types of electric arc furnaces.

Section 2 covers thread design, sizes and other pertinent details of the joining systems of cylindrical manufactured graphite electrodes most commonly used in all types of electric arc furnaces.

Section 3 of this publication covers the identification of 20- through 28-inch cylindrical manufactured graphite electrodes and associated connecting pins most commonly used in all types of electric arc furnaces, as well as the identification of electrodes designed for use in high power electric arc furnaces.

Throughout this publication, the values stated in U.S. customary units are to be regarded as the standard.

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Section 1
LENGTHS AND DIAMETERS

1.1 GENERAL

For best results, because of differences in physical properties, indiscriminate mixing of electrodes and connecting pins from different sources should be avoided. Property value differences are due to the variety of raw materials used in the manufacture of electrodes.

Authorized Engineering Information 5-19-1980.

1.2 TYPES OF ELECTRODES

There are two types of manufactured graphite electrodes:

1. Turned and threaded electrodes.
2. DT-type electrodes.

NEMA Standard 5-19-1980.

1.3 LENGTHS

The length of manufactured graphite electrodes shall be in accordance with Table 1-1.

NEMA Standard 5-19-1980.

1.4 DIAMETERS

The diameter of DT-type electrodes shall be in accordance with Table 1-2.

The diameter of turned and threaded electrodes shall be in accordance with Table 1-3.

NEMA Standard 5-19-1980.

Table 1-1
LENGTH OF TURNED, THREADED, AND DT-TYPE GRAPHITE ELECTRODES

Nominal Length			Full Length		Under Full Length	
inches†	mm	Exact Conv. to mm	inches†	mm	inches*†	mm*
24	600	609.6	23 to 24	584 to 610	21 to 22	533 to 559
30	750	762.0	28 to 31	711 to 787	24 to 27	610 to 686
36	900	914.4	34 to 37	864 to 940	30 to 33	762 to 838
40	1000	1016.0	37 to 41	940 to 1041	32 to 36	813 to 914
48	1200	1219.2	44 to 49	1118 to 1245	38 to 43	965 to 1092
60	1500	1524.0	56 to 61	1422 to 1549	49 to 55	1245 to 1397
72	1800	1828.8	67 to 73	1702 to 1854	62 to 66	1575 to 1676
84	2100	2133.6	78 to 85	1981 to 2159	72 to 77	1829 to 1956
96	2400	2438.4	90 to 97	2286 to 2464	84 to 89	2134 to 2261
110	2800	2794.0	100 to 112	2540 to 2845	90 to 99	2286 to 2515

* Due to manufacturing variables, a small percentage of electrodes may have the lengths given in this column. (This footnote is approved as Authorized Engineering Information.)
† Lengths shall be classified on the basis of the nearest inch. For example, an electrode measuring 67.5 inches shall be called a 68-inch electrode; an electrode measuring 67.4 inches shall be called a 67-inch electrode.

Table 1-2
DIAMETER OF DT-TYPE GRAPHITE ELECTRODES

Diameter								
Nominal			Maximum		Minimum		Nominal Length	
inches	mm	Exact Conv. to mm	inches	mm	inches	mm	inches	mm
2-1/2	60	63.5	2.375	60.3	2.358	59.9	30	750
3	75	76.2	2.938	74.6	2.922	74.2	40	1000
4	100	101.6	3.938	100.0	3.922	99.6	40	1000
5-1/8	130	130.2	5.031	127.8	5.016	127.4	40	1000
7	175	177.8	6.800	172.7	6.690	169.9	48	1200

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Table 1-3
DIAMETER OF TURNED AND THREADED GRAPHITE ELECTRODES

Diameter									Nominal Length		
Nominal			Maximum		Minimum		At Low Spot*				
inches	mm	Exact Conv. to mm	inches	mm	inches	mm	inches	mm	inches	mm	Exact Conv. to mm
1-1/4	30	31.8	1.28	32.5	1.22	31.0	1.19	30.2	24	600	609.6
1-1/2	40	38.1	1.53	38.9	1.47	37.3	1.44	36.6	24	600	609.6
2	50	50.8	2.03	51.6	1.94	49.3	1.91	48.5	24 30 48	600 750 1200	609.6 762.0 1219.2
2-1/2	60	63.5	2.53	64.3	2.44	62.0	2.41	61.2	30	750	762.0
3	75	76.2	3.07	78.8	2.88	73.2	2.85	72.4	40	1000	1016.0
4	100	101.6	4.07	103.4	3.88	98.6	3.84	97.5	40 48	1000 1200	1016.0 1219.2
5-1/8	130	130.2	5.20	132.1	5.00	127.0	4.96	126.0	40	1000	1016.0
6	150	152.0	6.07	154.2	5.88	149.4	5.75	146.1	48 60 72	1200 1500 1800	1219.2 1524.0 1828.8
7	175	177.8	7.07	179.6	6.88	174.8	6.75	171.5	48 60 72	1200 1500 1800	1219.2 1524.0 1828.8
8	200	203.2	8.07	205.0	7.88	200.2	7.75	196.9	48 60 72	1200 1500 1800	1219.2 1524.0 1828.8
9	225	228.6	9.07	230.4	8.88	225.6	8.75	222.3	60 72	1500 1800	1524.0 1828.8
10	250	254.0	10.07	255.8	9.88	251.0	9.75	247.7	48 60 72	1200 1500 1800	1219.2 1524.0 1828.8
12	300	304.8	12.07	306.6	11.88	301.8	11.75	298.5	60 72	1500 1800	1524.0 1828.8
14	350	355.6	14.07	357.4	13.88	352.6	13.75	349.3	60 72	1500 1800	1524.0 1828.8
16	400	406.4	16.07	408.2	15.88	403.4	15.75	400.1	72	1800	1828.8
17	425	431.8	17.12	434.9	16.88	428.8	16.75	425.5	60 72	1500 1800	1524.0 1828.8
18	450	457.2	18.12	460.3	17.88	454.2	17.75	450.9	60 72 96	1500 1800 2400	1524.0 1828.8 2438.4
20	500	508.0	20.12	511.1	19.88	505.0	19.75	501.7	60 72 84 96	1500 1800 2100 2400	1524.0 1828.8 2133.6 2438.4
22†	550	555.8	22.12	561.9	21.88	555.8	21.75	552.5	72 84	1800 2100	1828.8 2133.6
24	600	609.6	24.12	612.7	23.88	606.6	23.75	603.3	72 84 96 110	1800 2100 2400 2800	1828.8 2133.6 2438.4 2794.0
26†	650	660.4	26.12	663.6	25.88	657.2	25.75	654.1	96 110	2400 2800	2438.4 2794.0
28	700	711.2	28.12	714.3	27.88	708.2	27.75	704.9	96 110	2400 2800	2438.4 2794.0
30	750	762.0	30.12	765.1	29.88	759.0	29.50	749.3	110	2800	2794.0
35	875	889.0	35.12	892.1	34.88	886.0	34.50	876.3	110	2800	2794.0
40	1000	1016.0	40.12	1019.1	39.88	1013.0	39.50	1003.3	110	2800	2794.0
45	1150	1143.0	45.12	1146.1	44.88	1140.0	44.50	1130.3	110	2800	2794.0

* A low spot is a flat spot in a localized area untouched by the tool when the electrode is turned as compared with the remainder of the surface.
† Suggested Standard for Future Design.

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Section 2
JOINING SYSTEMS

2.1 CLASSES OF JOINING SYSTEMS

There are six classes of joining systems:

1. 60-degree flat thread (known in the industry as "National Coarse") (see Fig. 2-1).
2. 0.250 pitch taper thread (see Fig. 2-2).
3. 0.333 pitch taper thread (see Fig. 2-3).
4. 2.000 pitch flat thread (see Fig. 2-4).
5. 0.125 pitch taper thread (male-female) (see Fig. 2-6).†
6. 0.250 pitch taper thread (male-female) (see Fig. 2-7).

For the alternate class of joining systems, see Fig. 2-5.

NEMA Standard 5-19-1980.

†Suggested Standard for Future Design.

2.2 CONNECTING PIN SIZES

The nominal connecting pin size of the joining systems of cylindrical manufactured graphite electrodes shall be in accordance with Figs. 2-1 through 2-7.

NEMA Standard 5-19-1980.

2.3 SOCKET SIZES

The nominal socket size of the joining systems of cylindrical manufactured graphite electrodes shall be in accordance with Figs. 2-1 through 2-7.

NEMA Standard 5-19-1980.

2.4 THREAD DESIGN DETAIL[Δ]

The thread design and detail of the joining systems of cylindrical manufactured graphite electrodes shall be in accordance with Figs. 2-1 through 2-7.

Although Figs. 2-2, 2-3, and 2-5 specifically illustrate right-hand thread designs, the dimensions referenced in these figures also apply to the alternate left-hand designs used with some 20- and 24-inch electrodes.

NEMA Standard 5-19-1980.

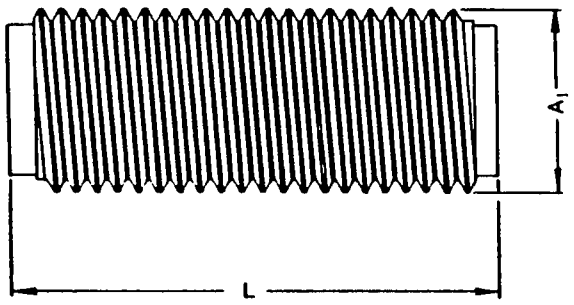
Caution should be exercised when designing or manufacturing a water cooled (or composite) electrode to interface with graphite electrodes in that the water cooled member of the joint should conform as closely as possible to the NEMA Standard socket or connecting pin nominal dimensions since the relatively "cold" operation may not need the same clearances as the high temperature graphite-to-graphite joint.

Authorized Engineering Information 9-15-1983.

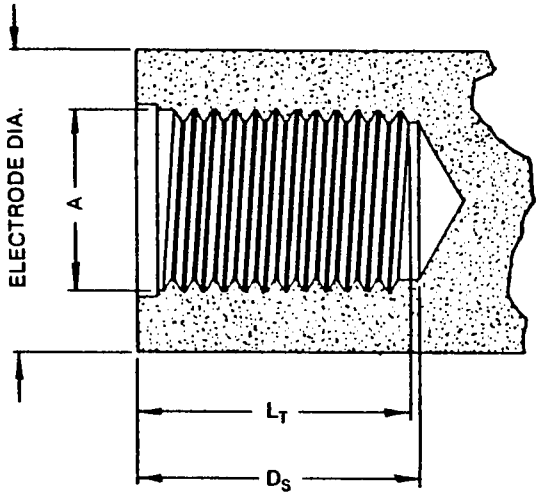
Δ Revised 9-15-1983.

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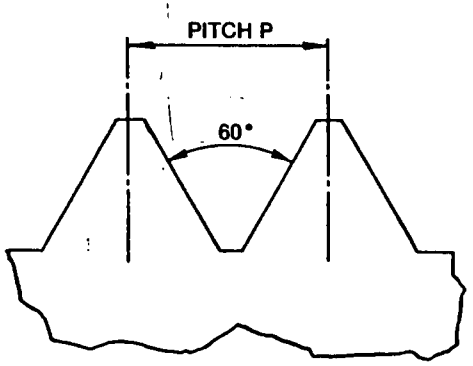
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CONNECTING PIN DETAIL



SOCKET DETAIL



60° FLAT THREAD DETAIL

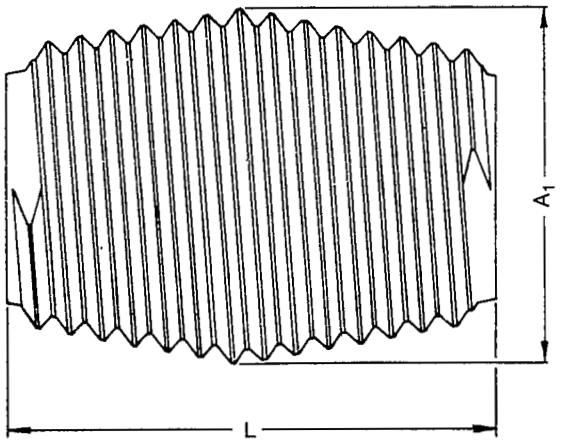
	Nominal Electrode Diameter	Connecting Pin: Nominal Pin Size "A_1" × "L"	Connecting Pin: Overall Length "L" Maximum	Connecting Pin: Overall Length "L" Minimum	Electrode Socket: Depth "D_S" Maximum	Electrode Socket: Depth "D_S" Minimum	Electrode Socket: Length of Thread "L_T" Maximum	Electrode Socket: Length of Thread "L_T" Minimum	Electrode Socket: Nominal Diameter "A"	Thread Detail: Pitch of Thread "P"	Thread Detail: Threads Per Inch
inches	1-1/4	0.750 × 2.00	2.000	1.969	1.187	1.062	1.157	1.000	0.750	0.1000	10
mm	30	19.05 × 50.80	50.80	50.01	30.16	26.99	29.39	25.40	19.05	2.540	
inches	1-1/2	0.750 × 2.00	2.000	1.969	1.187	1.062	1.157	1.000	0.750	0.1000	10
mm	40	19.05 × 50.80	50.80	50.01	30.16	26.99	29.39	25.40	19.05	2.540	
inches	2	1.250 × 3.00	3.000	2.969	1.687	1.562	1.657	1.500	1.250	0.1428	7
mm	50	31.75 × 76.20	76.20	75.41	42.86	39.69	42.09	38.10	31.75	3.627	
inches	2-1/2	1.500 × 4.00	4.000	3.969	2.187	2.062	2.157	2.000	1.500	0.1667	6
mm	60	38.10 × 101.60	101.60	100.81	55.56	52.39	54.79	50.80	38.10	4.234	

Contour of base of socket optional.

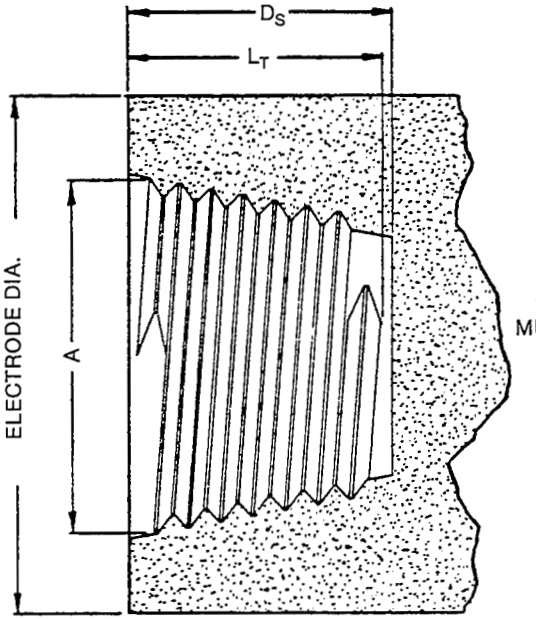
Fig. 2-1
JOINING SYSTEM—60-DEGREE FLAT THREAD (NATIONAL COARSE) CLASS

CG 1-82
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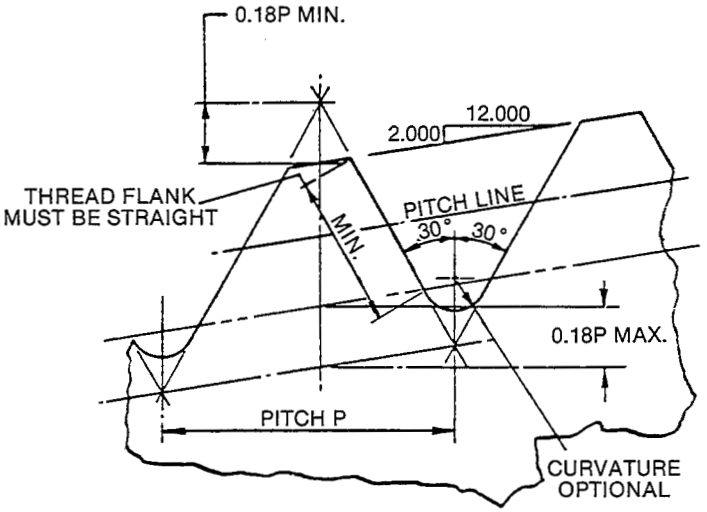
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CONNECTING PIN DETAIL



SOCKET DETAIL



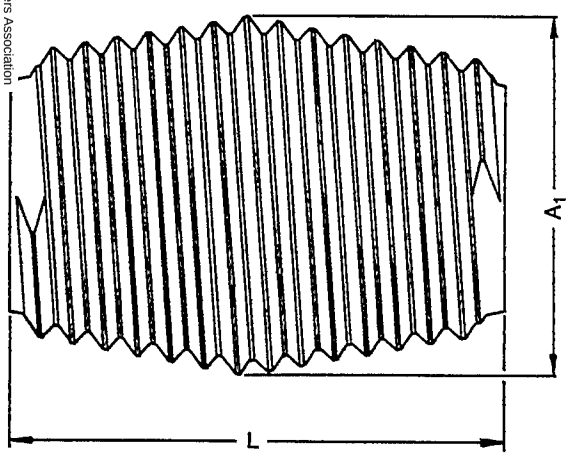
TAPER THREAD DETAIL
0.250 PITCH

	Nominal Electrode Diameter	Connecting Pin: Nominal Pin Size "A_1" × "L"	Connecting Pin: Overall Length "L" Maximum	Connecting Pin: Overall Length "L" Minimum	Electrode Socket: Depth "D_S" Minimum	Electrode Socket: Length of Thread "L_T" Minimum	Electrode Socket: Nominal Diameter "A"	Thread Detail: Pitch of Thread "P"	Thread Detail: Threads Per Inch
inches	3	1.812 × 3.00	3.000	2.938	1.687	1.500	1.812	0.250	4
mm	75	46.04 × 76.20	76.20	74.61	42.86	38.10	46.04	6.35	
inches	4	2.750 × 4.00	4.000	3.938	2.187	2.000	2.750	0.250	4
mm	100	69.85 × 101.60	101.60	100.01	55.56	50.80	69.85	6.35	
inches	5-1/8	3.125 × 5.00	5.000	4.938	2.687	2.500	3.125	0.250	4
mm	130	79.38 × 127.00	127.00	125.41	68.26	63.50	79.38	6.35	
inches	6	3.625 × 5.50	5.500	5.406	2.937	2.750	3.625	0.250	4
mm	150	92.08 × 139.70	139.70	137.32	74.61	69.85	92.08	6.35	
inches	7	4.250 × 6.50	6.500	6.406	3.437	3.250	4.250	0.250	4
mm	175	107.95 × 165.10	165.10	162.72	87.31	82.55	107.95	6.35	
inches	8	4.812 × 7.00	7.000	6.906	3.687	3.500	4.812	0.250	4
mm	200	122.24 × 177.80	177.80	175.42	93.66	88.90	122.24	6.35	
inches	20	10.625 × 18.00	18.000	17.906	9.187	9.000	10.625	0.250	4
mm	500	269.88 × 457.20	457.20	454.82	233.36	228.60	269.88	6.35	
inches	22	11.75 × 18	18.000	17.906	9.187	9.000	11.750	0.250	4
mm	550	298.45 × 457.20	457.20	454.82	233.36	228.60	298.45	6.35	
inches	24	12.500 × 18.00	18.000	17.906	9.187	9.000	12.500	0.250	4
mm	600	317.50 × 457.20	457.20	454.82	233.36	228.60	317.50	6.35	
inches	28	14.750 × 18.00	18.000	17.906	9.187	9.000	14.750	0.250	4
mm	700	374.65 × 457.20	457.20	454.82	233.36	228.60	374.65	6.35	

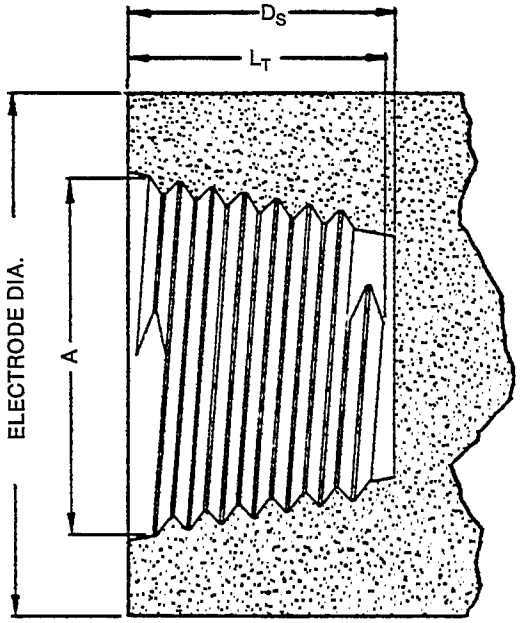
JOINING SYSTEM—0.250 PITCH TAPER THREAD CLASS
Fig. 2-2

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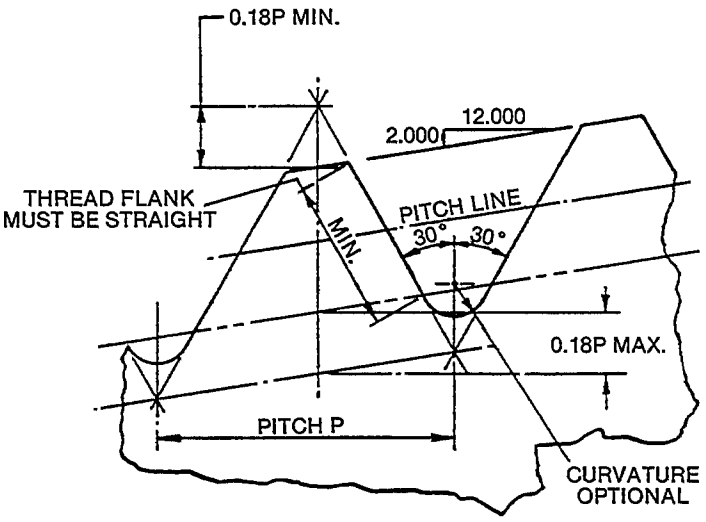
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CONNECTING PIN DETAIL



SOCKET DETAIL



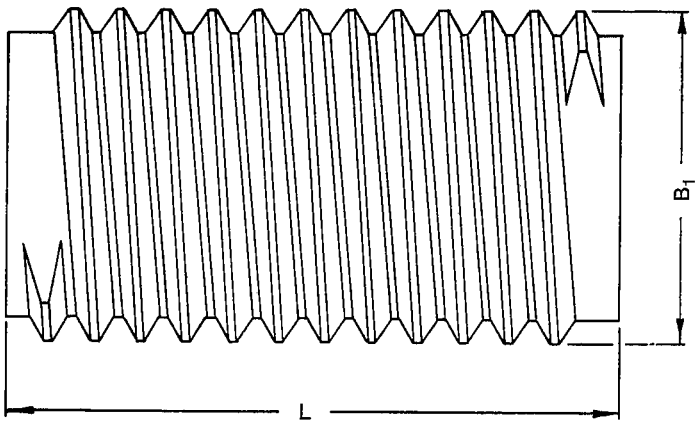
TAPER THREAD DETAIL
0.333 PITCH

	Nominal Electrode Diameter	Connecting Pin: Nominal Pin Size "A_1" × "L"	Connecting Pin: Overall Length "L" Maximum	Connecting Pin: Overall Length "L" Minimum	Electrode Socket: Depth of Socket "D_S" Minimum	Electrode Socket: Length of Thread "L_T" Minimum	Electrode Socket: Nominal Diameter "A"	Thread Detail: Pitch of Thread "P"	Thread Detail: Threads Per Inch
inches	9	5.500 × 8.00	8.000	7.906	4.187	4.000	5.500	0.333	3
mm	225	139.70 × 203.20	203.20	200.82	106.36	101.60	139.70	8.47	
inches	10	6.125 × 8.66	8.667	8.573	4.521	4.333	6.125	0.333	3
mm	250	155.58 × 219.96	220.14	217.75	114.83	110.06	155.58	8.47	
inches	12	6.975 × 10.66	10.667	10.573	5.52	5.333	6.975	0.333	3
mm	300	177.16 × 270.76	270.94	268.55	140.23	135.46	177.16	8.47	
inches	14	8.500 × 12.00	12.000	11.906	6.187	6.000	8.500	0.333	3
mm	350	215.90 × 304.80	304.80	302.42	157.16	152.40	215.90	8.47	
inches	16	8.500 × 12.00	12.000	11.906	6.187	6.000	8.500	0.333	3
mm	400	215.90 × 304.80	304.80	302.42	157.16	152.40	215.90	8.47	
inches	17	9.500 × 14.00	14.000	13.906	7.187	7.000	9.500	0.333	3
mm	425	241.30 × 355.60	355.60	353.22	182.56	177.80	241.30	8.47	
inches	18	9.500 × 14.00	14.000	13.906	7.187	7.000	9.500	0.333	3
mm	450	241.30 × 355.60	355.60	353.22	182.56	177.80	241.30	8.47	
inches	20	10.750 × 14.00	14.000	13.906	7.187	7.000	10.750	0.333	3
mm	500	273.05 × 355.60	355.60	353.22	182.56	177.80	273.05	8.47	

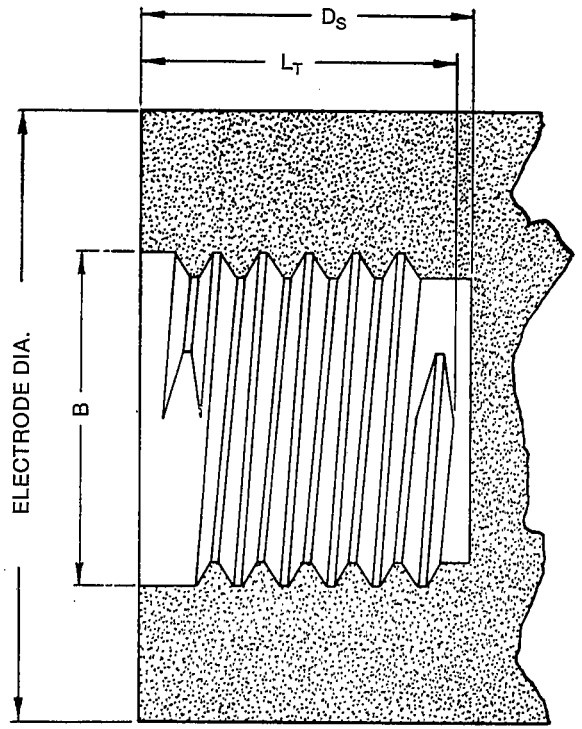
JOINING SYSTEM—0.333 PITCH TAPER THREAD CLASS
Fig. 2-3

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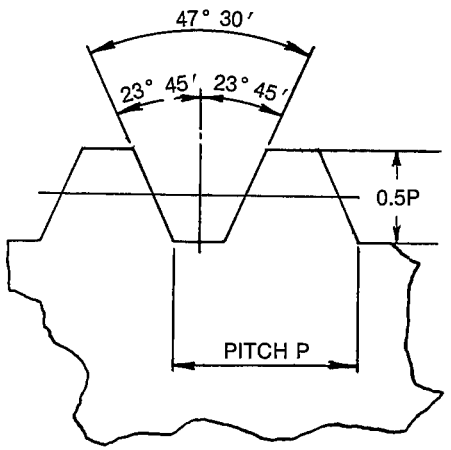
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CONNECTING PIN DETAIL



SOCKET DETAIL



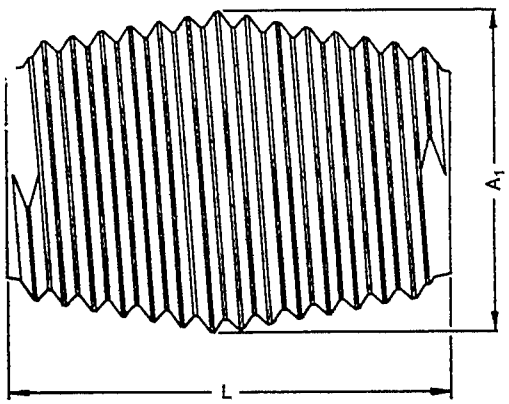
FLAT THREAD DETAIL
2.000 PITCH

	Nominal Electrode Diameter	Connecting Pin: Nominal Pin Size ‡ "B_1" × "L"	Connecting Pin: Overall Length "L" Maximum	Connecting Pin: Overall Length "L" Minimum	Electrode Socket: Depth "D_S" Maximum	Electrode Socket: Depth "D_S" Minimum	Electrode Socket: Length of Thread "L_T" * Maximum	Electrode Socket: Length of Thread "L_T" * Minimum	Electrode Socket: Nominal Pitch Diameter "B"	Thread Detail: Pitch of Thread "P"
inches	30	15.320 × 22.5	22.563	22.250	11.563	11.375	10.250	10.000	15.320	2.000
mm	750	389.13 × 571.5	573.09	565.15	293.70	288.92	260.35	254.00	389.13	50.8
inches	35	18.500 × 26.5	26.563	26.250	13.563	13.375	12.250	12.000	18.500	2.000
mm	875	469.90 × 673.1	674.69	666.75	344.50	339.72	322.15	304.80	469.90	50.8
inches	40	21.000 × 28.0	28.063	27.750	14.313	14.125	13.000	12.750	21.000	2.000
mm	1000	533.40 × 711.2	712.79	704.85	363.55	358.78	330.20	323.85	533.40	50.8
inches	45	23.000 × 30.0	30.063	29.750	15.313	15.125	14.000	13.750	23.000	2.000
mm	1150	584.20 × 762.0	763.59	755.65	388.95	384.18	355.60	349.25	584.20	50.8

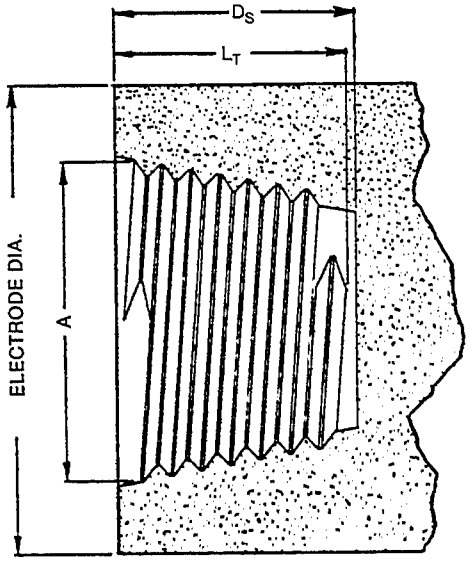
‡ Diameter of connecting pin expressed as pitch diameter.
* Maximum thread length on connecting pin is twice the minimum L_T

JOINING SYSTEM—2.000 PITCH FLAT THREAD (MODIFIED ACME) CLASS
Fig. 2-4

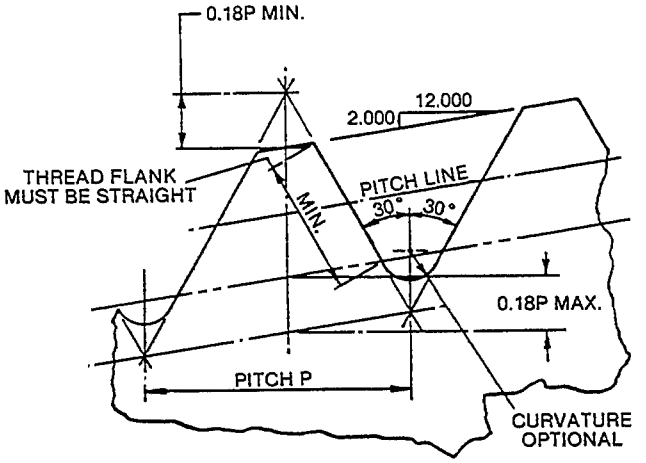
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CONNECTING PIN DETAIL



SOCKET DETAIL



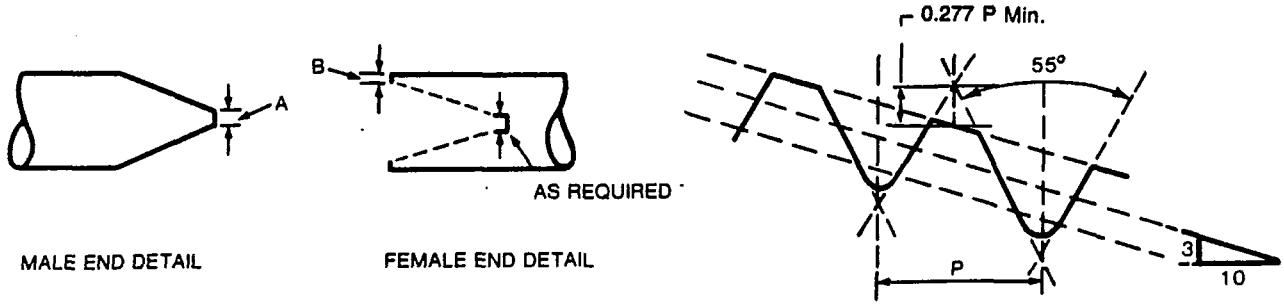
TAPER THREAD DETAIL

	Connecting Pin					Electrode Socket		Thread Detail	
	Nominal Electrode Diameter	Nominal Pin Size "A_1" × "L"	Overall Length "L" Maximum	Overall Length "L" Minimum	Depth "D_S" Minimum	Length of Thread "L_T" Minimum	Nominal Diameter "A"	Pitch of Thread "P"	Threads Per Inch
inches	10	5.500 × 8.00	8.000	7.906	4.187	4.000	5.500	0.333	3
mm	250	139.70 × 203.20	203.20	200.82	106.36	101.60	139.70	8.47	
inches	12	6.125 × 8.66	8.667	8.573	4.520	4.333	6.125	0.333	3
mm	300	155.58 × 219.96	220.14	217.75	114.83	110.06	155.58	8.47	
inches	14	6.975 × 10.66	10.667	10.573	5.520	5.333	6.975	0.333	3
mm	350	177.16 × 270.76	270.94	268.55	140.23	135.46	177.16	8.47	
inches	16	9.500 × 14.00	14.000	13.906	7.187	7.000	9.500	0.333	3
mm	400	241.30 × 355.60	355.60	353.22	182.56	177.80	241.30	8.47	
inches	17	9.500× 12.00	12.000	11.906	6.187	6.000	9.500	0.333	3
mm	425	241.30 × 304.80	304.80	302.42	157.16	152.40	241.30	8.47	
inches	18	9.500 × 12.00	12.000	11.906	6.187	6.000	9.500	0.333	3
mm	450	241.30 × 304.80	304.80	302.42	157.16	152.40	241.30	8.47	
inches	18	10.750 × 14.00	14.000	13.906	7.187	7.000	10.750	0.333	3
mm	450	273.05 × 355.60	355.60	353.22	182.56	177.80	273.05	8.47	
inches	20	10.625 × 14.00	14.000	13.906	7.187	7.000	10.625	0.250	4
mm	520	269.88 × 355.60	355.60	353.22	182.56	177.80	269.88	6.35	
inches	20	10.750 × 18.000	18.000	17.906	9.187	9.000	10.750	0.333	3
mm	500	273.05 × 457.20	457.20	454.82	233.36	228.60	273.05	8.47	
inches	20	11.75 × 18.00	18.000	17.906	9.187	9.000	11.750	0.250	4
mm	500	298.45 × 457.20	457.20	454.82	233.36	228.60	298.45	6.35	
inches	24	12.500 × 14.00	14.000	13.906	7.187	7.000	12.500	0.250	4
mm	600	317.50 × 355.60	355.60	353.22	182.56	177.80	317.50	6.35	
inches	24	13.250 × 18.00	18.000	17.906	9.187	9.000	13.250	0.250	4
mm	600	336.55 × 457.20	457.20	454.82	233.36	228.60	336.55	6.35	

ALTERNATE CLASS JOINING SYSTEM—PITCH TAPER THREAD CLASS
Fig. 2-5

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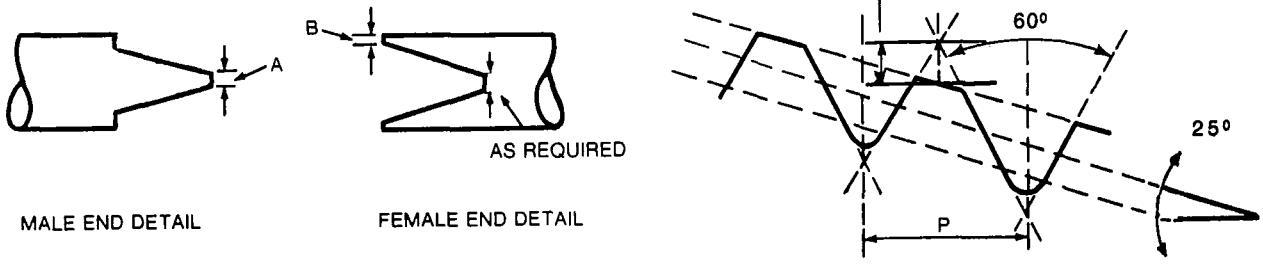


	Nominal Electrode Diameter	Male End Diameter "A" Minimum	Female End Nominal Shoulder Width "B" Minimum	Thread Detail	
				Pitch of Thread "P"	Threads Per Inch
Inches	3	1	0.125	0.125	8
mm	75	25	3.175	3.175	
Inches	4	1	0.125	0.125	8
mm	100	25	3.175	3.175	
Inches	5 1/8	2	0.225	0.125	8
mm	130	50	5.715	3.175	
Inches	6	2.5	0.225	0.125	8
mm	150	63	5.715	3.175	

Figure 2-6
JOINING SYSTEM—0.125 PITCH TAPER THREAD (MALE-FEMALE) CLASS

NOTE: Length shall be as shown in Table 1-1 except maximum length may be increased by the length of the threaded male end.
Suggested Standard for Future Design 10-16-1985.

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	Nominal Electrode Diameter	Male End Diameter "A" Minimum	Female End Nominal Shoulder Width "B" Minimum	Thread Detail	
				Pitch of Thread "P"	Threads per inch
inches	7	2.75	0.250	0.250	4
mm	175	70	6.350	6.350	
inches	8	3.15	0.325	0.250	4
mm	200	80	8.255	6.350	
inches	9	3.60	0.370	0.250	4
mm	225	90	9.400	6.350	
inches	10	3.95	0.470	0.250	4
mm	250	100	11.940	6.350	

Figure 2-7
JOINING SYSTEM – 0.250 PITCH TAPER THREAD CLASS (MALE–FEMALE) CLASS

Note: Length shall be as shown in Table 1-1 except maximum length may be increased by the length of the threaded male end.

Suggested Standard for Future Design 9-26-88.

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Section 3
ELECTRODES FOR ELECTRIC ARC FURNACES

3.1 IDENTIFICATION OF 20- THROUGH 28-INCH-DIAMETER MANUFACTURED GRAPHITE ELECTRODES FOR ELECTRIC ARC FURNACES

A. Electrodes designed for high-power electric arc furnaces shall be identified by means of the letter "H" printed on the end covers in a contrasting color not less than 1 inch high. The socket base shall also be indented with the letter "H" not less than 1 inch high located on a separate line from the lot and piece number identification.

B. Electrode threading shall be identified as follows:

1. Electrodes with right-hand threading shall be identified by a single band as shown in Fig. 3-1.
2. Electrodes with left-hand threading shall be identified by a double band as shown in Fig. 3-2.

C. Connecting pins with left-hand threading shall have the designation "L" not less than 2 inches high printed on the carton and stenciled on the connecting pin.

D. The size of connecting pins shall be printed on the carton in which they are shipped.

NEMA Standard 5-19-1980.



Fig. 3-1
ELECTRODES WITH RIGHT-HAND THREADING



Fig. 3-2
ELECTRODES WITH LEFT-HAND THREADING

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NEMA STANDARDIZATION

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The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA Bylaws, which are quoted below:

Purpose of Standards

National Electrical Manufacturers Association Standards are adopted in the public interest and are designed to eliminate misunderstandings between the manufacturer and the purchaser and to assist the purchaser in selecting and obtaining the proper product for its particular need. Existence of a National Electrical Manufacturers Association Standard does not in any respect preclude any member or nonmember from manufacturing or selling products not conforming to the standard.

(Bylaw—Art. V, Sec. 1)

Definition of a Standard

A standard of the National Electrical Manufacturers Association defines a product, process or procedure with reference to one or more of the following: nomenclature, composition, construction, dimensions, tolerances, safety, operating characteristics, performance, rating, testing, and the service for which they are designed.

(Bylaw—Art. V, Sec. 2, Subsection A)

Dimensions

Where dimensions are given for interchangeability purposes, alternate dimensions satisfying the other provisions of the standards publication may be capable of otherwise equivalent performance.

(NEMA Policy Memorandum 84-2, dated June 7, 1984)

Classes of Standards

National Electrical Manufacturers Association Standards are of two classes:

1. NEMA Standard, which relates to a product commercially standardized and subject to repetitive manufacture, which standard has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon;
2. Suggested Standard for Future Design, which may not have been regularly applied to a commercial product, but which suggests a sound engineering approach to future development, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote thereon.

(Bylaw—Art. V, Sec. 2, Subsection B)

Authorized Engineering Information

Authorized Engineering Information consists of explanatory data and other engineering information of an informative character not falling within the classification of NEMA Standard or Suggested Standard for Future Design.

(Bylaw—Art. V, Sec. 6, 1st Sentence)

Official Standards Proposal

An Official Standards Proposal is an official draft of a proposed standard which is formally recommended to an outside organization(s) for consideration, comment and/or approval.

(Bylaw—Art. V, Sec. 4, Subsection A)

Identification of Status

Standards in NEMA Standards Publications are identified in the foreword or following each standard as "NEMA Standard" or "Suggested Standard for Future Design." These indicate the status of the standard. These words are followed by a date which indicates when the standard was adopted in its present form by the Association.

The material identified as "Authorized Engineering Information" and "Official Standards Proposal" is designated similarly.

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