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STANDARDS PUBLICATION/NO. MW 755

nema

Straight Flange Magnet Wire Plastic Spools/Reels

NEMA

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

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STRAIGHT FLANGE MAGNET WIRE PLASTIC SPOOLS/REELS

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Foreword

The purpose of this Standards Publication is to provide guidelines to magnet wire manufacturers and plastic spool/reel suppliers in the design and construction characteristics of commonly used plastic spools and reels; and, to provide technical information and data on plastic spools/reels design to users wishing to select appropriate plastic spools/reels for a particular purpose.

The information contained in this publication has been thoroughly reviewed by all suppliers of plastic spools/reels known to be manufacturing these products at the time of publication. The issuance or existence of this Standards Publication does not, in any respect, prevent or restrict any member or non-member of NEMA from supplying customers with magnet wire spools/reels not in conformance with its contents.

This Standards Publication has been developed by the NEMA Magnet Wire Section, which periodically reviews it for any revisions necessary to keep it up to date with changes in technology. Comments or proposed revisions are welcomed and should be submitted to:

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SCOPE

This Standard covers the dimensional, physical, and visual characteristics of newly-molded, straight flange plastic spools/reels for packaging of magnet wire.

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Section 1
REFERENCED STANDARDS

1.1 Referenced Standards

In this publication reference is made to the following publications. Copies are available from the sources indicated.

International Standards and Law Information
P.O. Box 230
Accord, MA 02018

American National Standards Institute (ANSI)
1430 Broadway
New York, NY 10018

DIN 46399 **Deutsche Industrie Norm**	
Part 1 (September 1982)	*Delivery Spools for Bare and Insulated Wires; Dimensions*
Part 2 (April 1986)	*Delivery Spools for Bare and Insulated Wires;* *Technical Terms of Delivery for Spools of Plastic*
CEI IEC 264-2-1	*Packaging of Winding Wires* *Cylindrical Barrelled Delivery Spools* *Section One—Cylindrical Barrelled Delivery Spools*
CEI IEC 264-3-1	*Taper Barrelled Delivery Spools* *Section One—Basic Dimensions*
CEI IEC 264-4-1	*Methods of Test* *Section One—Delivery Spools Made From Thermoplastic Material*

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Section 2
DEFINITIONS

2.1 SPOOL

A spool is defined as having a flange diameter of less than 8 inches.

2.2 REEL

A reel is defined as having a flange diameter of 8 inches or larger.

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Section 3
RAW MATERIALS

3.1 MATERIALS

All spools/reels shall be fabricated from materials specified by the wire producer.

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Section 4
PHYSICAL APPEARANCE

4.1 FLANGES

The flanges shall be smooth and free from all material flash which could interfere with over-the-flange de-reeling or cause wire damage.

4.2 FLASHING

Flashing shall be kept to a minimum in bore area in order to prevent spool removal problems on oven and rewind take-ups.

4.3 FLANGE DIAMETER AND INNER FLANGE SURFACES

The flange diameter and inner flange surfaces, and the related radius between these two surfaces shall be free of nicks, scratches, burrs, solvent splash, or solvent runs which will interfere with wire de-reeling and automatic winding.

4.4 BARREL

The barrel of the spool within its winding area shall be smooth in order to prevent damage to the product.

4.4.1 Solvent/Adhesive Runs

Solvent/adhesive runs along the barrel shall not raise or depress the as-molded surface of the barrel in excess of 0.002 inch.

4.5 SOLVENT/ADHESIVE WELD LENGTH

The solvent/adhesive weld length shall be such that it shows signs that at least 90 percent of the bond area has been covered and solvent applied.

4.6 BUTT SURFACES AND BOND LINE

There shall be no gap between the butt surfaces and the bond line. The line at this butt area shall not exceed an outward extension of 0.002 inch or recess of 0.002 inch for spools or 0.005 inch and 0.002 inch respectively for reels.

4.7 SINKS

Sinks in the winding area shall be kept to a minimum and shall not be greater than 0.010 inch deep for 3-inch and larger spools, except that 3-inch and smaller spools used for 44-1/2 AWG and finer wire applications shall be 0.005 inch maximum. Sinks in the 60-degree cone area which will affect barrel concentricity or flange run-out, shall not be acceptable. Sinks in the non-winding area shall be acceptable as long as other properties of the spool are within limits.

4.8 APPEARANCE AND COLOR

Appearance and color of spools/reels shall be specified by the wire producer.

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Section 5
DIMENSIONS

5.1 DIMENSIONS AND TOLERANCES

5.1.1 Dimensions - Non-Tapered Barrel

Typical dimensions for standard non-tapered barrel spools/reels are in accordance with Figure 5-1, Figure 5-3, Tables 5-1, 5-2, and 5-6. Information contained in Figure 5-3 and Table 5-6 is adopted from IEC publication CEI/IEC 264-2-1:1989 and represents Authorized Engineering Information.

5.1.2 Dimensions - Tapered Barrel

Typical dimensions for tapered barrel reels are in accordance with Figure 5-2 and Table 5-3.

NEMA Standard 3-4-1991.

5.1.3 Recommended Dimensions and Tolerances

Dimensions and Tolerances contained in Tables 5-4, 5-5, and 5-6 are those recommended by magnet wire manufacturers to assist in interchangeability of spools and reels on reeling and de-reeling equipment.

Authorized Engineering Information 3-4-1991.

5.1.4 Reel Sizes

Reel sizes are defined nominally in Tables 5-3 and 5-5 as:

$$\frac{\text{Top Flange Diameter}}{\text{Bottom Flange Diameter}} \quad \text{Traverse Length}$$

Authorized Engineering Information 3-4-1991.

5.2 MEASUREMENT METHODS

Measurement methods used by spool/reel manufacturers shall be such that they ensure adequate reproducability.

5.2.1 Flange Thickness

For measuring flange thickness, the spool/reel shall be placed on a surface plate in the vertical position. The flange thickness measurement shall be taken 0.25 inch from the barrel, by suitable equipment capable of measurements to within 0.001 inch.

5.2.2 Barrel Concentricity

Barrel concentricity shall be measured by engaging the 60 degree countersink of the bore with 60 degree conical centers. The pick-up point of a calibrated measuring device shall rest on the barrel, approximately 0.125 inch away from the flange. The spool/reel shall be rotated using "live" conical centers.

5.2.2.1 BARREL CONCENTRICITY—SPOOLS 6 INCHES AND LESS

Barrel concentricity for 6-inch and smaller spools shall not exceed a total indicator reading (TIR) of 0.010 inch.

5.2.2.2 BARREL CONCENTRICITY—SPOOLS 6 to 8 INCHES

Barrel concentricity for spools greater than 6 inches but less than 8 inches shall not exceed a total indicator reading (TIR) of 0.015 inch.

5.2.2.3 BARREL CONCENTRICITY—REELS 8 to 12 INCHES

Barrel concentricity for straight and taper barrel reels sizes 8 through 12 inches, shall not exceed a total indicator reading (TIR) of 0.020 inch.

5.2.2.4 BARREL CONCENTRICITY—REELS 12 INCHES AND GREATER

Barrel concentricity for reel sizes greater than 12 inches shall not exceed a total indicator reading (TIR) of 0.025 inch.

5.2.3 Flange Wobble

Flange wobble shall be measured using the holding fixtures described in 5.2.2. The pickup point of the calibrated measuring device shall track on the traverse side of the flange 0.25 inch down from the flange outer diameter.

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5.2.3.1 FLANGE WOBBLE—SPOOLS 3 INCHES AND GREATER

Flange wobble for spools greater than 3 inches shall meet a requirement of 0.010-inch total indicator reading (TIR). For 3 inch spools the TIR shall not exceed 0.005 inch.

5.2.3.2 FLANGE WOBBLE—REELS 8 INCHES AND GREATER

Flange wobble for reels with flange diameters 8 inches through 11 inches shall not exceed 0.015 total indicator reading (TIR). Flange wobble for 12-inch reels shall not exceed 0.020 total indicator reading (TIR). Flange wobble for reels with a flange diameter greater than 12 inches shall be determined by agreement of the wire producer and reel supplier.

5.2.4 Flange Angle

Flange angle shall be as shown in Figure 5-1 and shall not exceed 90 degrees nor be less than 89 degrees 30 minutes for all spools. The total accumulation in traverse reduction (flange toe-in) at the outer edge of the flange (measured 0.125-inch inward from maximum flange diameter) shall not exceed 0.020 inch for spools.

5.2.5 Traverse Length

Traverse length shall be measured, flange to flange, 0.125-inch out from the maximum barrel dimension, parallel to the center line of the arbor holes.

5.2.6 Barrel Diameter

Barrel diameter on all 2-piece spools shall be measured 0.0625 inch from either side of the bond line, allowing for 0.004 inch bond build to be added to the diameter of the barrel.

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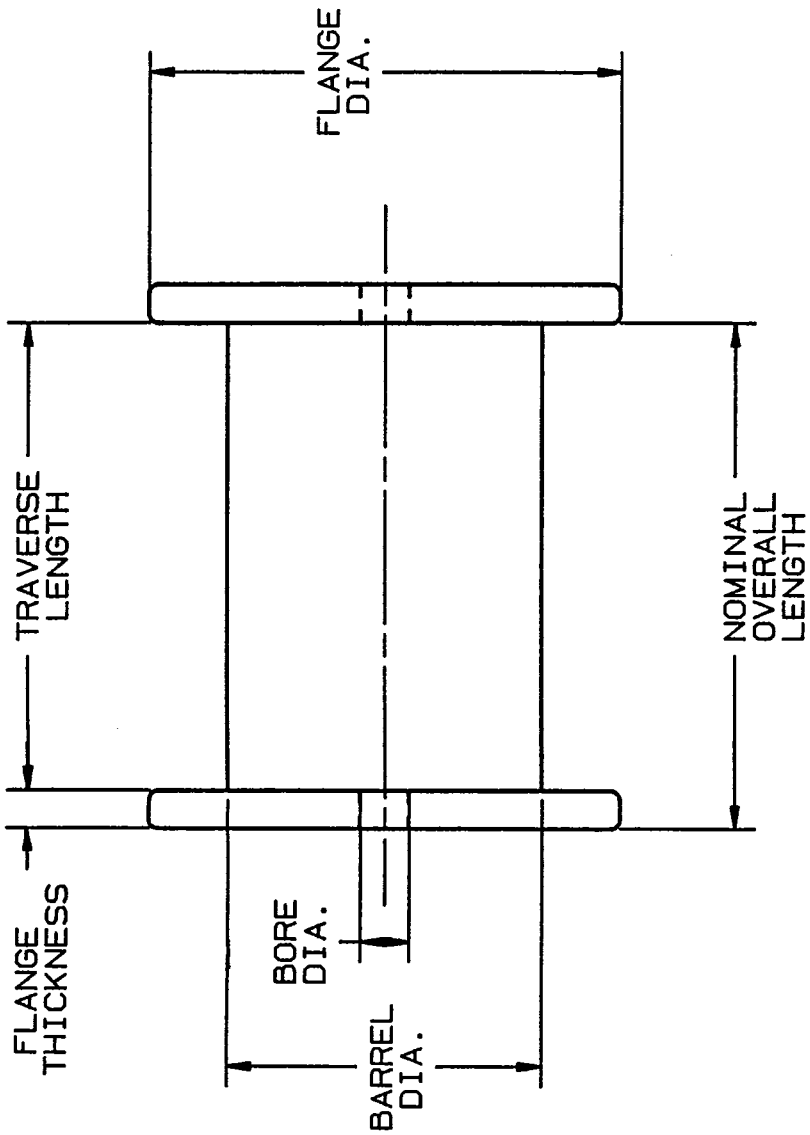


Figure 5-1
STRAIGHT BARREL SPOOL/REEL

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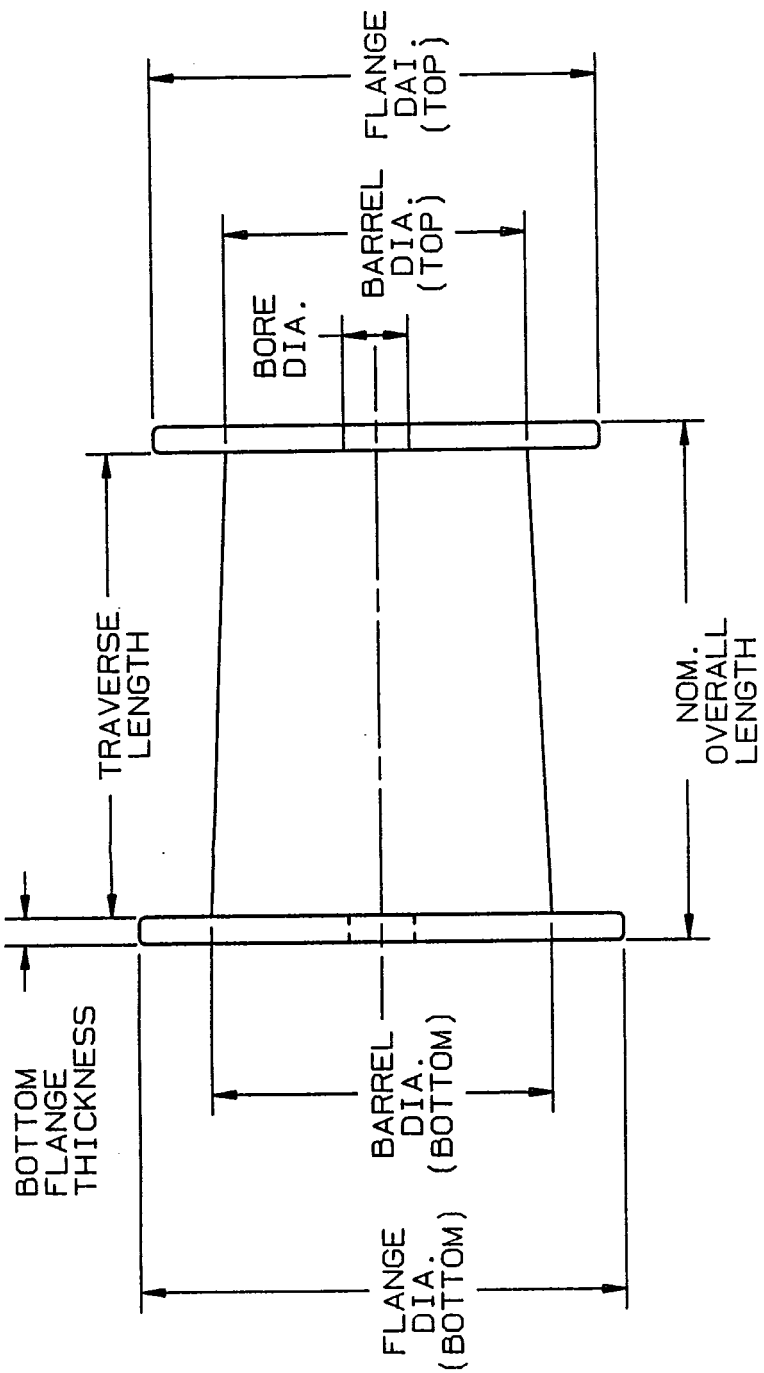


Figure 5-2
TAPER BARREL SPOOL/REEL

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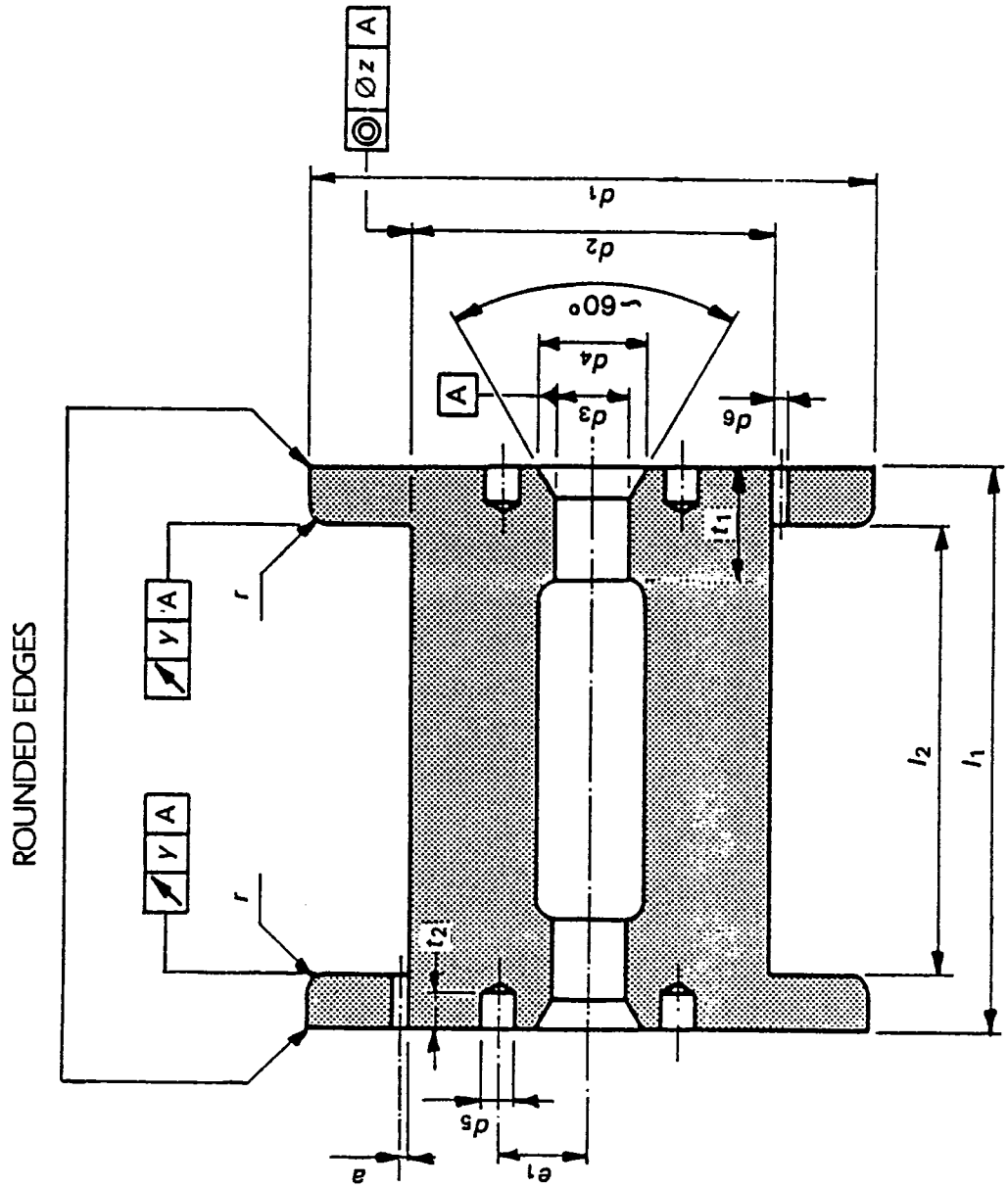


Figure 5-3
IEC CYLINDRICAL BARRELLED DELIVERY SPOOLS

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Table 5-1
STRAIGHT BARREL SPOOL/REEL DIMENSIONS AND TOLERANCES (In Inches)

Standard Nomenclature (inches)	Supplier	Nom. Wt. Cu.* Wt. (lbs.)	Nom Tare Wt. (lbs.)	Flange Diameter	Flange Thickness	Traverse Length	Nom. Overall Length	Barrel Diameter	Bore Diameter
2 (d)	A B C	0.75	0.15	2.500 ± 0.010	0.184 ± 0.005	3.000 ± 0.005	3.375	1.760 ± 0.10	0.629 ± 0.010 - 0.000
3	A B C	2	0.17	3.000 ± 0.010	0.250 ± 0.005	3.483 ± 0.005	4	1.750 ± 0.010	0.629 ± 0.010 - 0.000
5	A B C	6	0.38	4.875 ± 0.015	0.250 ± 0.005	3.500 ± 0.005	4	3.000 ± 0.010	0.629 ± 0.010 - 0.000
5 WF	A B C	6	0.46	5.000 ± 0.015	0.312 ± 0.005	3.500 ± 0.005	4.125	3.000 ± 0.020	0.629 ± 0.010 - 0.000
6 IF	A B C	9	0.60	6.000 ± 0.020	0312. ± 0.005	3.500 ± 0.005	4.125	3.500 ± 0.020	0.629 ± 0.010 - 0.000
6 WF	A B C	9	0.67	6.000 ± 0.028	0.408 ± 0.008	3.500 ± 0.005	4.316	3.500 ± 0.020	0.629 ± 0.010 - 0.000
6 TF	A B C	9	0.48	6.000 ± 0.020	0.250 ± 0.005	3.500 ± 0.005	4	3.500 ± 0.020	0.629 ± 0.010 - 0.000
6 x 6	A B	14	1.02	6.000 ± 0.020	0.500 ± 0.005	6.000 ± 0.010	7	3.750 ± 0.020	0.629 ± 0.010 - 0.000
	C	14	1.01	6.000 ± 0.030	0.500 ± 0.008	6.000 ± 0.000	7	3.750 ± 0.020	0.629 ± 0.010 - 0.000
8 x 6	A B C	25	1.43	8.000 ± 0.025	0.682 ± 0.005	5.995 ± 0.010	7.375	4.625 ± 0.020	**
8 x 6-1(d)	A B C	25	1.47	8.000 ± 0.025	0.682 ± 0.005	5.995 ± 0.010	7.375	4.625 ± 0.020	**
12	A B	75	2.92	11.750 ± 0.030	0.625 ± 0.010	7.000 ± 0.010	8.250	6.560 ± 0.030	**
	C	75	2.70	11.750 ± 0.030	0.645 ± 0.015	7.000 ± 0.010	8.250	6.560 ± 0.030	**
12 WF (d)	A B C	75	3.70	12.000 ± 0.030	0.680 ± 0.010	7.002 ± 0.010 - 0.030	8.4375	6.560 ± 0.030	**

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Table 5-1 (Continued)
STRAIGHT BARREL SPOOL/REEL DIMENSIONS AND TOLERANCES (In Inches)

Standard Nomenclature (Inches)	Supplier	Nom. Wt. Cu.* Wt. (lbs.)	Nom Tare Wt. (lbs.)	Flange Diameter	Flange Thickness	Traverse Length	Nom. Overall Length	Barrel Diameter	Bore Diameter
24	A	250	16.9	24.000 ± 0.040	1.375 ± 0.010	6.000 ± 0.020	8.750	14.00 ± 0.030	**
	B	250	15.9	24.020 ± 0.040	1.395 ± 0.010	6.000 ± 0.020	8.750	14.00 ± 0.020	**
	C								

* For aluminum, divide by 3.3

** As specified by the wire producer.

IF - Intermediate Flange; WF - Wide Flange; TF - Thin Flange

d = one piece design

This table shows dimensions and tolerances for commercially available spools/reels. Inclusion of supplier dimensions is not an endorsement of their products, rather it reflects known products at the time of printing.

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Table 5-2
STRAIGHT BARREL SPOOL/REEL DIMENSIONS AND TOLERANCES (In Inches)
U. S. MANUFACTURED DIN*-TYPE SPOOLS**

Standard Nomenclature	Supplier	Nom. Wt. Cu.† Wt. (lbs.)	Nom. Tare Wt. (lbs.)	Flange Diameter	Flange Thickness	Traverse Length	Nom. Overall Length	Barrel Diameter	Bore Diameter
DIN 80	A B C	1.625	0.15	3.150 ± 0.010	0.315 ± 0.005	2.520 ± 0.006	3.150	1.969 ± 0.010	0.630 ± 0.010 - 0.000
DIN 100	A B C	3	0.3	3.937 ± 0.010	0.394 ± 0.005	3.150 ± 0.008	3.937	2.480 ± 0.010	0.630 ± 0.010 - 0.000
DIN 125	A B C	6	0.4	4.921 ± 0.015	0.492 ± 0.005	3.937 ± 0.008	4.921	3.150 ± 0.020	0.630 ± 0.010 - 0.000
DIN 160	A B C	13	0.8	6.299 ± 0.020	0.630 ± 0.010	5.039 ± 0.008	6.299	3.939 ± 0.020 and and	0.866 ± 0.010 - 0.000 0.630 ± 0.010 - 0.000 0.875 ± 0.008 - 0.000
DIN 200	A B C	26	1.3	7.874 ± 0.010	0.788 ± 0.010	6.299 ± 0.012	7.874	4.921 ± 0.020	0.875 ± 0.008 - 0.000
DIN 250	A B C	39	2.4	9.843 ± 0.025	9.843 ± 0.025	6.299 ± 0.016	7.874	6.299 ± 0.020	0.866 ± 0.010 - 0.000

* Deutsche Industries Norm (DIN)
**For DIN spools not currently manufactured in the U.S., see DIN Specification Number 46399.
†For aluminum, divide by 3.3
See Table 5-6 for recommended DIN dimensions specified by international standards.

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Table 5-3
TAPERED BARREL/STRAIGHT FLANGE
DIMENSIONS AND TOLERANCES (In Inches)

Standard Nomenclature	Supplier	Nom. Wt. Cu.* Wt. (lbs.)	Nom Tare Wt. (lbs.)	Reel Size	Flange Diameter-Top	Flange Diameter-Bottom	Transverse Length	Bottom Flange Thickness	Nominal Overall Length	Barrel Diameter-Top	Barrel Diameter-Bottom	Bore Diameter
50	A	40	1.8	8.5/9.25 x 9	8.50 ± 0.015	9.25 ± 0.015 - 0.015	9.00 ± 0.010	0.531 ± 0.010	10.062	5.750 ± 0.015	6.500 ± 0.015	**
100	A	85	2.9	10/11 x 12	10.00 ± 0.020	11.00 ± 0.020 - 0.020	12.00 ± 0.005	0.625 ± 0.010	13.375	6.046 ± 0.935	7.00 ± 0.020	**
	B	85	3.6	10/11 x 12	10.00 ± 0.020	11.00 ± 0.020	12.01 ± 0.010	0.690 ± 0.010	13.375	6.050 ± 0.020	7.00 ± 0.010	**
	C	85	2.9	10/11 x 12	10.00 + 0.020	11.00 + 0.020	11.96 + 0.010	0.655 + 0.010	13.375	6.062 + 0.030	7.00 + 0.010	**
250	A	275	8.9	15/16 x 12	15.00 ± 0.035	16.00 ± 0.035	11.96 ± 0.015	1.187 ± 0.010	14.375	7.960 ± 0.021	9.00 ± 0.020	**
	B	275	8.9	15/16 x 12	15.00 ± 0.010	16.01 ± 0.010	11.96 ± 0.015	1.260 ± 0.010	14.500	8.025 ± 0.020	8.965 ± 0.020	**
	C	275	8.0	15/16 x 12	15.00 ± 0.035	16.00 ± 0.035	11.96 ± 0.015	1.210 ± 0.010	14.375	8.000(x)	9.000(x)	**
500	A	550	12.5	15/16 x 24	15.00 ± 0.035	16.00 ± 0.035	23.86 ± 0.020	1.187 ± 0.010	26.375	7.960 ± 0.020	9.000 ± 0.020	**
	C	550	12.5	15/16 x 24	15.00 ± 0.035	16.00 ± 0.035	23.86 ± 0.020	1.210 ± 0.010	26.375	7.960 ± 0.020	9.000 ± 0.020	**
550	A	525	13.4	16.50/19.50 x 18	16.50 ± 0.035	19.50 ± 0.035	17.96 ± 0.020	1.187 ± 0.010	20.250	7.960 ± 0.020	9.260 ± 0.020	**
650	A	650	13.7	16.50/19.50 x 18.50	16.50 ± 0.035	19.50 ± 0.035	18.388 ± 0.020	1.187 ± 0.010	20.750	7.960 ± 0.020	9.000 ± 0.020	**
750	A	750	15.3	16.50/19.50 x 30	16.50 ± 0.035	19.50 ± 0.035	23.86 ± 0.020	1.187 ± 0.010	26.1875	7.960 ± 0.020	9.000 ± 0.020	**
1000	A	925	17.5	16.50/19.50 x 30	16.50 ± 0.035	19.50 ± 0.035	29.86 ± 0.020	1.187 ± 0.010	32.1875	7.960 ± 0.020	9.260 ± 0.020	**

* For aluminum, divide by 3.3

** As specified by the wire producer.

(x) - Octagonal

This table shows dimensions and tolerances for commercially available reels. Inclusion of supplier dimensions is not an endorsement of their products, rather it reflects known products at the time of printing.

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Table 5-4
STRAIGHT BARREL SPOOL/REEL
RECOMMENDED DIMENSIONS AND TOLERANCES (In Inches)

Standard Nomenclature	Nom. Net Wt.* Cu. (lbs.)	Flange Diameter	Flange Thickness	Traverse Length	Overall Length	Barrel Diameter	Bore Diameter
2.50	0.75	2.500 ± 0.010	0.184 ± 0.002	3.000 ± 0.003	3.375	1.760 ± 0.010	0.629 + 0.003 - 0.000
3	2	3.000 ± 0.010	0.250 ± 0.005	3.500 ± 0.005	4	1.750 ± 0.010	0.630 + 0.005 - 0.000
5	6	4.875 ± 0.015	0.250 ± 0.005	3.500 ± 0.005	4	3.000 ± 0.010	0.630 + 0.005 - 0.000
5 WF	6	5.000 ± 0.015	0.310 ± 0.005	3.500 ± 0.005	4.125	3.000 ± 0.010	0.630 + 0.005 - 0.000
6 IF	9	6.000 ± 0.020	0.312 ± 0.005	3.500 ± 0.005	4.125	3.500 ± 0.010	0.630 + 0.005 - 0.000
6 WF	9	6.000 ± 0.020	0.405 ± 0.005	3.500 ± 0.005	4.375	3.500 ± 0.010	0.630 + 0.005 - 0.000
6 TF	9	6.000 ± 0.020	0.250 ± 0.005	3.500 ± 0.005	4	3.500 ± 0.010	0.630 + 0.005 - 0.000
6 x 6	14	6.000 ± 0.020	0.500 ± 0.005	6.000 ± 0.005	7	3.750 ± 0.010	0.630 + 0.005 - 0.000
8 x 6	25	8.000 ± 0.020	0.500 ± 0.005	6.000 ± 0.010	7.375	4.600 ± 0.020	0.630 + 0.005 - 0.000
12	75	11.750 ± 0.020	0.625 ± 0.010	7.000 ± 0.015	8.250	6.560 ± 0.020	0.630 + 0.005 - 0.000
24	250	24.000 ± 0.040	1.375 ± 0.020	6.000 ± 0.020	8.750	14.000 ± 0.020	0.630 + 0.005 - 0.000

* For aluminum, divide by 3.3

IF - Intermediate Flange; WF - Wide Flange; TF - Thin Flange

See Table 5-1 for actual dimensions currently available from suppliers. This Table includes dimensions and tolerances recommended by wire producers for future spool/reel designs only and is not intended to include all spools and reels currently available from suppliers.

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Table 5-5
TAPERED BARREL/STRAIGHT FLANGE
RECOMMENDED DIMENSIONS AND TOLERANCES (In Inches)

Standard Nomenclature	Nom. Wt. Cu.* Wt. (lbs.)	Spool/Reel Size	Flange Diameter-Top	Flange Diameter-Bottom	Transverse Length	Bottom Flange Thickness	Nominal Overall Length	Barrel Diameter-Top	Barrel Diameter-Bottom	Bore Diameter
50	40	8.50/9.25 x 9	8.500 ± 0.015	9.250 ± 0.015	9.000 ± 0.010	0.531 ± 0.010	10.0625	5.500 ± 0.015	6.500 ± 0.015	**
100	85	10/11 x 12	10.000 ± 0.020	11.000 ± 0.020	12.000 ± 0.010	0.650 ± 0.010	13.375	6.050 ± 0.010	7.000 ± 0.020	**
250	275	15/16 x 12	15.000 ± 0.035	16.000 ± 0.035	12.000 ± 0.015	1.218 ± 0.010	14.375	7.960 ± 0.020	9.000 ± 0.020	**
500	550	15/16 x 24	15.000 ± 0.035	16.000 ± 0.035	23.060 ± 0.020	1.187 ± 0.010	26.375	7.960 ± 0.020	9.000 ± 0.020	**
550	525	16.50/19.50 x 18	16.500 ± 0.035	16.500 ± 0.035	17.960 ± 0.020	1.187 ± 0.010	20.250	7.960 ± 0.020	9.260 ± 0.020	**
750	750	16.50/19.50 x 24	16.500 ± 0.035	19.500 ± 0.035	23.860 ± 0.020	1.187 ± 0.010	26.1875	7.960 ± 0.020	9.000 ± 0.020	**
1000	925	16.50/19.50 x 30	16.500 ± 0.035	19.500 ± 0.020	29.860 ± 0.030	1.187 ± 0.010	32.1875	7.960 ± 0.020	9.260 ± 0.020	**

* For aluminum, divide by 3.3
** As specified by wire producer.

This table includes dimensions and tolerances recommended by wire producers for future spool/reel designs only and is not intended to include all spools and reels currently available from suppliers.

NEMA Standard 3-4-1991.

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Table 5-6
STRAIGHT BARREL SPOOL/REEL
RECOMMENDED DIMENSIONS AND TOLERANCES (In millimeters)

Spool Type	d_1	d_2	d_3* Nom.	d_3* Tol.	d_4	d_5	d_6**	l_1	l_2 Nom.	l_2 Tol.	a**	t_1	t_2	z	y	e_1	r
40	40	25	11	+0.1 0	15	...	1.5	50	38	±0.10	0.75	14	...	0.4	0.08	...	1
50	50	32	11	+0.1 0	15	...	1.5	50	38	±0.15	0.75	16	...	0.4	0.10	...	1
63	63	40	11	+0.1 0	15	...	2	63	49	+0.15	1.0	18	...	0.4	0.15	...	1.6
80	80	50	16	+0.2 0	24	7	2	80	64	±0.15	1.0	20	8	0.6	0.15	20	2
100	100	63	16	+0.2 0	24	7	2	100	80	±0.2	1.0	22	8	0.6	0.2	20	3
125	125	80	16	+0.2 0	24	7	3	125	100	±0.2	1.5	25	8	0.6	0.2	20	3
160	160	100	22	+0.2 0	34	13	3	160	128	±0.2	1.5	28	12	0.6	0.3	32	3
200	200	125	22	+0.2 0	34	13	3	200	160	±0.3	1.5	32	12	0.6	0.3	32	4
250	250	160	22	+0.2 0	34	13	4	200	160	±0.4	2.0	36	12	1.0	0.4	32	5
355	355	224	36	+0.5 0	60	26	5	200	160	±0.4	2.5	40	30	1.2	0.5	80	5
500	500	315	36	+0.5 0	60	26	10	250	180	±0.5	5.0	40	30	1.6	0.7	80	5
710	710	500	51	+0.5 0	80	26	15	250	180	±0.8	7.5	45	30	2.0	1.0	140	6
1000	1000	800	51	+0.5 0	80	26	26	250	180	+1.0	13	50	30	3.0	1.5	140	6

See Section 1—Referenced Standards.

* For spool types 250 and 710, a central bore diameter d_3 of (36 +0.5/-0) mm may be used if agreed between supplier and purchaser.

** Spools without holes can be ordered if agreed between supplier and purchaser.

NEMA Adoptive Standard
CEI/IEC 264-2-1:1989.

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Section 6
STRENGTH OF SPOOLS/REELS

6.1 STRENGTH OF SPOOLS/REELS

Barrel strength, flange impact, and flange deflection are the three most critical factors since poor performance in any of these three areas could lead to spool/reel failure.

Following are the items that spool/reel users and suppliers should address to insure required strengths.

Authorized Engineering Information 3-4-1991.

1. Spool/reel users will make recommendations for spool/reel size ranges needed for various wire sizes and types;

2. Spool/reel users will require survival of spools/reels under normal shipping and warehousing conditions;

3. Flange deflection must be minimized to prevent wire entrapment during spooling which will eventually inhibit the de-reeling process;

4. Spool/reel users will work with spool/reel suppliers to establish minimum performance requirements of spools/reels used for various purposes;

5. Any certification of mechanical performance of spools/reels is left to the discretion of the spool/reel user and supplier;

6. Spool/reel users shall specify strength requirements and tests to be performed as required; and,

7. Spools/reels shall be constructed in a manner that ensures safety during normal in-plant handling operations.

NEMA Standard 3-4-1991.

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Section 7
GENERAL FEATURES

7.1 LIFTING OF SPOOLS/REELS

All spools/reels supplied under this specification shall have a means for lifting. Reels carrying more than 20 lbs. and less than 150 lbs. of wire shall have an elongated lifting hole at each end of the reel in the circumferential direction, at least 1 inch wide in the radial direction. Reels in excess of 150 lbs. shall provide a means for mechanical lifting.

NEMA Standard 3-4-1991.

7.2 DRIVING OF SPOOLS/REELS

All spools/reels shall have a method for driving by means of a pin through the spool/reel flange.

NEMA Standard 3-4-1991.

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NEMA STANDARDIZATION

The purpose of NEMA Standards, their classification and status are set forth in certain clauses of the NEMA *Standardization Policies and Procedures* manual and are referenced 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 their particular needs. 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.

(Standardization Policies and Procedures, p. 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.

(Standardization Policies and Procedures, p. 2)

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.

(Standardization Policies and Procedures, p. 8)

Categories of Standards

National Electrical Manufacturers Association Standards are of three classes:

1. NEMA Standard, which relates to a product, process or procedure 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.
3. Adoptive Standard, which is adopted in whole or in part from the standards of another organization, either domestic, regional, or international.

(Standardization Policies and Procedures, pp 7 & 16)

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, which standard has been approved by at least two-thirds of the members of the Subdivision eligible to vote on the standard.

(Standardization Policies and Procedures, pp. 7 & 16)

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, and which has been approved by at least 90 percent of the members of the Subdivision eligible to vote thereon. *(Standardization Policies and Procedures, pp 7 & 16)*

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.

July 17, 1990

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WIRE AND CABLE DIVISION
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