Product & Engineering Catalog

mission

Rea will lead our industry in the quality of our products, the safety of our employees, and in the value that we provide to our customers. A principal requirement is to consistently achieve financial results that will provide funds from operations to support reinvestment in facilities and growth that will increase the value of the Company. Innovation and cost-effectiveness are essential to all of our efforts. Rea must attract and develop capable people who accept the accountability for their own jobs, as well as, the responsibility to improve our Company's performance. We all must work together to earn job security and to create a productive, challenging and safe work environment. Rea will be socially responsible and will endeavor to improve quality of life in the communities in which we operate. It is vital to our future that Rea employees understand, are committed to, and work together to carry out this Mission.

Rea

TABLE OF CONTENTS

Insulation Cross Reference Guide

Insulation Cross Reference Guide							
Rea Trade Name	Thermal Rating	U.L. Thermal Listing[1]	Rea Material Code	Available Conductor Configuration	Applicable Copper Specification		Soderable
					NEEMA MW 1000	IEC	
Film Insulated							
Formvar®[2]	105° C		F	Round	MW 15	60317-1	No
				Square & Rect.	MW 18	60317-17	
Solvar®	155° C	155° C	S	Round	MW 79	60317-20	390° C, 3 sec
Nysol®	155° C	155° C	NS	Round	MW 80	60317-21	430° C, 3 sec
Thermsol®	180° C	180° C			MW 77	60317-23	455° C, 3 sec
Therm-ID®	200° C	~~200° C~~	~~1~~	Round	MW 74	60317-42	No
Super HYSLIK® 200	200° C	200° C	TAIH	Round	MW 35,73	60317-13	No
	AL 220° C	AL 220° C					
Super HYSLIK®® 220	220° C		TAIHT	Round	MW 37		No
				Square & Rect.	MW 38		
Therm-Aimid®	200° C	200° C	TAI	Round	MW 35,73	60317-13	No
	AL 220° C	AL 220° C		Square & Rect.	MW 36	60317-29	
Pulse Shield SD®	200° C	200° C	TAIHSD	Round	MW 35~~,73~~	60317-13	No
				Square & Rect.	MW 36	60317-29	
Pyre-ML®[4]	240° C	220° C[5]	ML	Round	MW 16	60317-46	No
				Square & Rect.	MW 20	60314-47	
Bondable Film Insulated							
Reabond A Nysol®	130° C		RANS	Round	MW 29		~~360~~° C, 3 sec
Reabond M	180° C	180° C	RSI	Round	~~MW 102~~		No
Fibrous Covered							
Dacron®[3]/Glass	155° C		DG	Round	MW 45		No
	180° C						
	200° C			Square & Rect.	MW 46		
"Dacron®[3]/Glass over Therm-Aimid®	155° C		DGTAI	Round	MW 45		No
	180° C						
	200° C			Square & Rect.	MW 46		

1 Rea U.L. File Number E37683 (N)
2 Formvar® is a registered trademark of Chisso
3 Dacron® is a registered trademark of E. I. duPont deNemours and Co., Inc.
4 Pyre-ML® is a registered trademark of Summit Precision Polymers
5 240° C UL Rating Pending

Insulation AWG Size/Build	Formvar 18 Heavy	Nysol 18 Heavy	Reabond M 18 Type 1	Super Hyslik 200 18 Heavy	Pulse Shield SD 18 Heavy	ML 18 Heavy
Thermal Properties						
NEMA Thermal Rating	105°C	155°C	180°C	~~180~~°C	200°C	240°C
U.L. Thermal Listing	N/A	155°C	180°C	~~180~~°C	200°C	220°C
Thermal Endurance ASTM D2307	118°C	178°C	194°C	~~197~~°C	213°C	257°C
Thermoplastic Flow	230°C	255°C	270°C	270°C	350°C	440°C
Heat Shock	3X @ 175°C	2X @ 175°C	3X @ 200°C	2X @ ~~200~~°C	3X @ 220°C	3X @ 240°C
Solderability	N/A	3 sec @ 430°C	5 sec @ 455°C	N/A	N/A	N/A
Bonding Temperature	N/A	N/A	220-2400C	N/A	N/A	N/A
Mechanical Properties						
Abrasion Resistance	1,200 g	1,500 g	1,200 g	1,900 g	1,700 g	1,000 g
Dynamic Coefficient of Friction	0.09	0.09	0.07	0.05	0.06	0.08
% Elongation	36%	36%	37%	37%	37%	37%
Electrical						
Dielectric at Room Temperature	10,000	10,000	11,000	11,000	~~12,300~~	12,000
Dielectric at Rated Temperature	~~8,000~~	~~8,000~~	~~8,000~~	~~8,700~~	~~8,700~~	~~9,500~~
Dielectric Constant	3.88	4.32	3.50	3.52	3.59	3.68
Chemical Resistance						
VM&P Naptha	Good	Good	Good	Good	Good	Good
Toluol	Good	Good	Good	Good	Good	Good
Ethyl Alcohol	Good	Good	Good	Good	Good	Good
5% Sulphuric Acid	Good	Good	Good	Good	Good	Good
1% Potassium Hydroxide	Good	Good	Good	Good	Good	Good
Xylol	Good	Good	Good	Good	Good	Good
5% Hydrochloric Acid	Good	Good	Good	Good	Good	Good
Carbon Tetrachloride	Good	Good	Good	Good	Good	Good
Acetone	Good	Good	Good	Good	Good	Good
Trichlorethylene	Good	Good	Good	Good	Good	Good
Radiation Stability	Poor	Poor	Fair	Poor	Fair	Good
Butyl Acetate	Good	Good	Good	Good	Good	Good
5% Potassium Hydroxide	Good	Good	Good	Good	Good	Fair
Ethyl Acetate	Good	Good	Good	Good	Good	Good
Fluid Compatibility (Retention of properties after 168 hours at 125°C.)						
Transmission Fluid	Good	Good	Fair	Good	Good	Good
Power Steering Fluid	Fair	Good	Good	Good	Good	Good
Brake Fluid (with 1% water)	Poor	Poor	Poor	Poor	Poor	Poor
Engine Oil	Fair	Good	Good	Good	Good	Good
Antifreeze (ethylene glycol in water)	Poor	Good	Poor	Fair	Poor	Poor
Xylene	Poor	Good	Poor	Fair	Good	Good
Degreaser	Good	Good	Good	Good	Good	Good
2.5% Salt and 0.5% Soap in Water	Poor	Good	Poor	Fair	Poor	Fair
Differential Fluid	Good	Good	Poor	Good	Good	Good
Hydraulic Oil	Poor	Good	Fair	Good	Good	Good
Synthetic Oil	Poor	Good	Good	Good	Good	Good
Diesel Fuel	Fair	Good	Poor	Poor	Good	Good
Gasohol (15% Methanol)	Poor	Poor	Poor	Poor	Good	Good

APPLICATIONS

Typical Applications

Oil-filled transformers

Superconducting coils for cryogenic applications

Motors

PRODUCT DESCRIPTION

Thermal Class: 105

Proven performance in oil-filled applications

Excellent hydrolytic stability

Features and Benefits

Resistant to mechanical and winding abuse due to superior flexibility and abrasion resistance.

Performs well in in-line flattening processes.

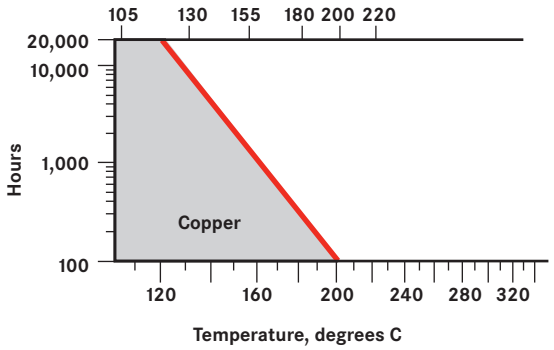
Compatible with most varnishes and impregnation compounds.

Retains insulating properties when exposed to cryogenic temperatures.

Compatible with transformer oils.

Measured Thermal Endurance

18 AWG, Heavy Build Insulation



GENERAL INFORMATION

References are provided for comparative purposes

Round

NEMA: MW 15-C, MW 15-A
UL: File No. E37683

Square & Rectangular

NEMA: MW 18-C, MW 18-A

Availability:

Round

Copper

Single 8-23 AWG
Heavy 4-23 AWG

Aluminum

Single ~~14~~ 18 AWG
Heavy 4-18 AWG

Square

Copper

Heavy 1-14 AWG

~~**Aluminum**~~

~~Heavy 1-10 AWG~~

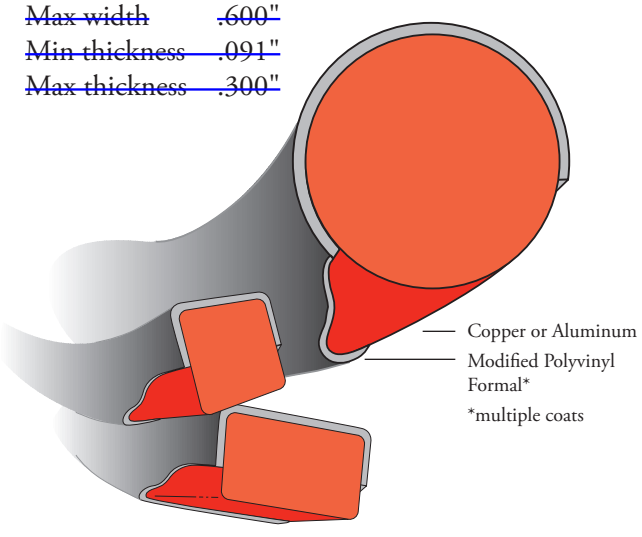
Rectangular (heavy)

Copper

Min width	.081"
Max width	.750"
Min thickness	.030"
Max thickness	.292"

~~**Aluminum**~~

~~Min width~~	~~.229"~~
~~Max width~~	~~.600"~~
~~Min thickness~~	~~.091"~~
~~Max thickness~~	~~.300"~~



TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance
20,000 hr Life: >110°C

Thermoplastic Flow
Min: 180°C typical: 230°C

Heat Shock (20% 3x)
1/2 hr @ 175°C min: no cracks

~~**Solderability**~~
~~@ 510°C (950°F): 5 seconds (flux recommended)~~

Stress Relief Temp: 150°C

MECHANICAL

Mandrel Flexibility
After Elongation min: 20% 3x OK
typical: 30% 1x OK
After Snap min: 3x OK
typical: 1x OK

Unilateral Scrape
Avg. of 3 sides min: 1150 gms
typical: 1600 gms

ELECTRICAL

Dielectric Breakdown
@ RT: 10 kV
@ 105°C: 7 kV

High Voltage Continuity
NEMA @ 1500 V DC: 5 faults/100 feet max
typical @ ~~3000~~ V DC: 0-1 faults/100 feet

CHEMICAL

Completeness of Cure
5 min boil 70/30
Alcohol/Toluene: Pass

Transformer Oil System
Test in Sealed Tubes
After 168 hrs @ 150°C:
Retained Flexibility–1x OK
Retained Dielectric–90% of
Original Breakdown Voltage

Resistance to Solvents
After 24 hrs @ RT: Pass,
Solvents Including:
Xylene
50/50 Cellosolve/Xylene
Perchloroethylene
1% NaOH
28% Sulfuric Acid
Gasohol

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

Nysol®/155

NS

APPLICATIONS

Typical Applications

Coils (particularly random wound), universal motors

Relays

Lighting ballast transformers

Fractional HP motors

Torroidal coils

Ignition coils

PRODUCT DESCRIPTION

Thermal Class: 155

Solderable without prior insulation removal

Polyamide (Nylon†) overcoat provides excellent mechanical protection during winding and insertion

†DuPont trademark

Features and Benefits

Excellent dereeling and windability on high speed and/or automated winding machines.

Produces compact coils and windings.

Self-fluxing providing excellent soldered connections with solder temperatures as low as 360°C.

Exceptional film flexibility and adhesion resisting winding damage.

Extremely resistant to a variety of solvents including most varnishes and hardener catalysts.

GENERAL INFORMATION

References are provided for comparative purposes

NEMA: MW 80-C

UL: File No. E37683

Standard Color:

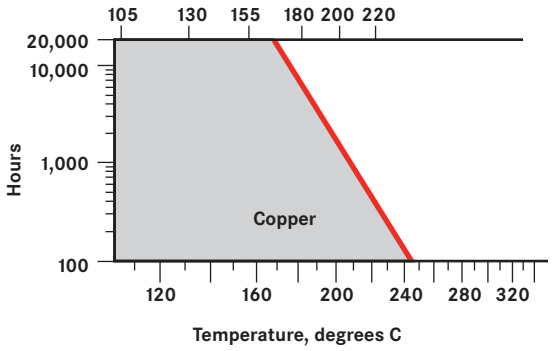
Red

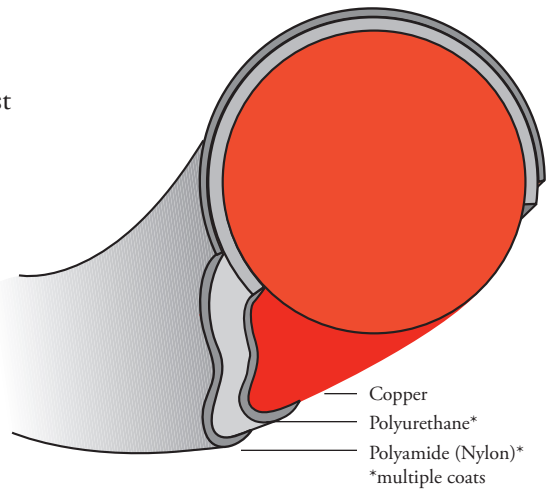
Availability:

Single and Heavy	10-54 AWG
Quad	10-31 AWG

Measured Thermal Endurance

18 AWG, Heavy Build Insulation





TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance
20,000 hr Life: >160°C

Thermoplastic Flow
Min: 200°C
Typical: 230°C

Heat Shock (20% 3x)
1/2 hr @ 175°C min: no cracks

Solderability
@ 430°C (800°F): 3 seconds (flux recommended)

Stress Relief Temp: 130°C

MECHANICAL

Mandrel Flexibility

After Elongation	min: 20% 3x OK typical: 30% 1x OK
After Snap	min: 3x OK typical: 1x OK

Unilateral Scrape

Avg. of 3 sides	min: 1150 gms typical: 1500 gms

ELECTRICAL

Dielectric Breakdown
@ RT: 8.5 kV
@ 155°C: 6.0 kV

High Voltage Continuity
NEMA @ 1500 V DC:
5 faults/100 feet max

Typical @ 3000 V DC:
0-1 faults/100 feet

CHEMICAL

Resistance to Solvents
After 24 hrs @ RT: Pass,

Solvents Including:
Xylene
50/50 Cellosolve/Xylene
Perchloroethylene
1% NaOH
28% Sulfuric Acid
Freon TMS

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

Super Hyslik 200®

TAIH

INSULATION ENGINEERING DETAIL

APPLICATIONS

Typical Applications

Dry-type transformers, hermetic motors, tool motors, automotive alternator stators, solenoids, television high-voltage transformers, toroidal television yokes

PRODUCT DESCRIPTION

Thermal Class: **200 (Copper)**
220 (Aluminum)

Features and Benefits

Super Hyslik 200 includes a proprietary internal lubricating system to aid windability and insertion.

Tough abrasion-resistant surface which withstands automated winding operations.

Excellent dielectric performance and corona resistance.

Superior chemical and moisture resistance, especially with refrigerants in hermetic applications.

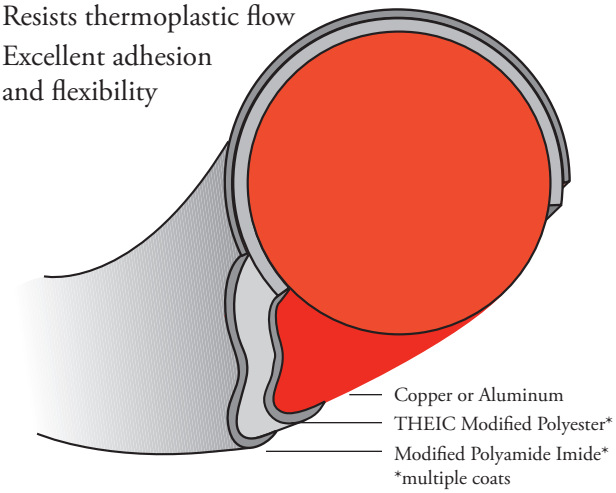
Superior thermal overload protection, especially during locked-rotor conditions.

Superior performance in hermetics.

(See chemical data)

Basecoat

High thermal endurance
High temperature dielectric
Resists thermoplastic flow
Excellent adhesion and flexibility



Topcoat

Heat shock resistant
Moisture resistant
Surface toughness
Chemical resistant

GENERAL INFORMATION

References are provided for comparative purposes

Round

NEMA: Copper MW 35-C, MW 73-C
Aluminum MW 35-A, MW 73-A
UL: File No. E37683

Square & Rectangular

NEMA: MW 36-C (Cu)
UL: File No. E37683

Round

Copper

Single 14-38 AWG
Heavy 4-37 AWG

Aluminum

Single 14-27 AWG
Heavy 6-27 AWG

Square

Copper (heavy) 1-14 AWG

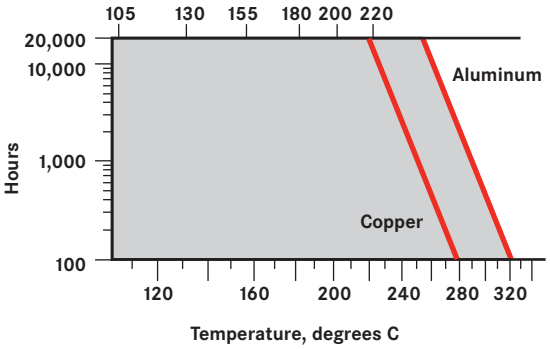
Rectangular (heavy)

Copper

Min width .081"
Max width .750"
Min thickness .030"
Max thickness .292"

Measured Thermal Endurance

Expected Thermal Life (ASTM D 2307), 18 AWG, Heavy Build Insulation



TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance
20,000 hr Life: >210°C

Thermoplastic Flow
Min: 300°C typical: 350°C

Heat Shock (20% 3x)
1/2 hr @ 220°C min. no cracks
1/2 hr @ 240°C min. no cracks

~~**Solderability**~~
~~@ 480°C (900°F): No~~

Stress Relief Temp 160°C

MECHANICAL

Mandrel Flexibility

After Elongation	min: 20% 3x OK typical: 30% 1x OK
After Snap	min: 3x OK typical: 1x OK

Unilateral Scrape

Avg. of 3 sides	min: 1150 gms typical: 1700 gms

Repeated Scrape

700 gms	min: 60 strokes typical: 100 strokes
Dynamic C of F	typical: 0.046

ELECTRICAL

Dielectric Breakdown
@ RT: 11 kV
@ 200°C: 7 kV

High Voltage DC Continuity
NEMA @ 1500 V DC: 5 faults/100 feet max
typical @ ~~3000~~ V DC: 0-1 faults/100 feet

~~**Corona Inception Voltage**~~
~~typical: 580 V~~

CHEMICAL

Retained Dielectric
After 72 hrs exposure to R-22 + 300°C conditioning: 3.5 kV

R-22 Extractables .08%

Resistance to Solvents
After 24 hrs @ RT: Pass,

Solvents Including:
Xylene
50/50 Cellosolve/Xylene,
Perchloroethylene
1% NaOH,
28% Sulfuric Acid,
Gasohol

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

Pulse Shield SD®

TAIHSD

APPLICATIONS

Typical Applications

High speed windings with difficult insertion and winding characteristics for inverter-driven motors

High voltage motors

High frequency transformers

PRODUCT DESCRIPTION

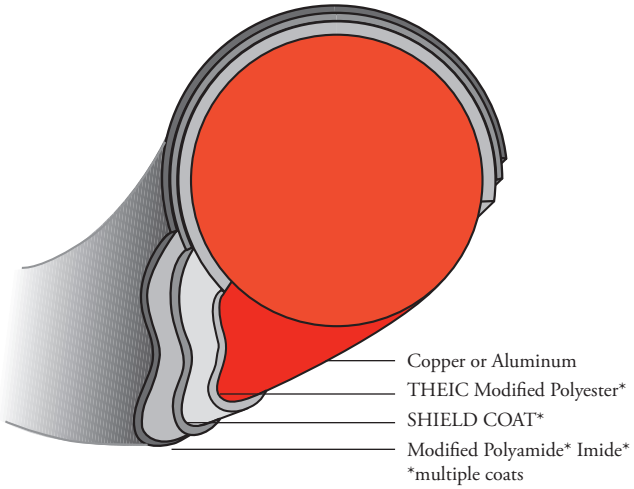
Thermal Class: 200 (Copper)

Resistant to voltage stresses generated by high frequency, rapid rise time, voltage spikes typically introduced by IGBT-type inverters. Motor life is increased significantly over standard MW-35C magnet wire under these voltage stresses and across a wide temperature range

Improved insulation protection against transient spikes, high frequencies, elevated voltage levels, and short rise time pulses without increasing insulation thickness

Excellent resistance to thermoplastic flow (cut-through), abrasion and heat shock

Excellent resistance to heat and solvent shock conditions encountered in varnishing and encapsulating processes



GENERAL INFORMATION

References are provided for comparative purposes

Round

NEMA: MW 35-C, MW 73-C

UL: File No. E37683

Availability

Round

Copper

Heavy 4-24 AWG

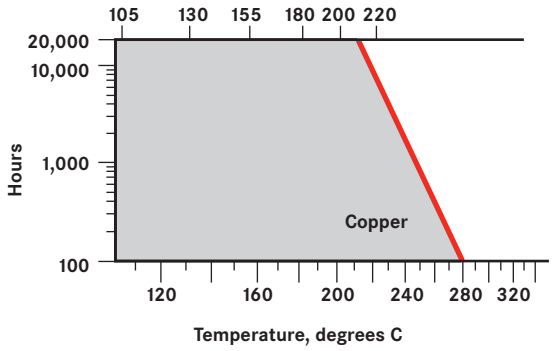
Rectangular (heavy)

Copper

Min width	.081"
Max width	.750"
Min thickness	.030"
Max thickness	.292"

Measured Thermal Endurance

18 AWG, Heavy Build Insulation



U.S. Patent No. 6,056,995

TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance
20,000 hr Life: >200°C

Thermoplastic Flow
min: 300°C
typical: 350°C

Heat Shock (20% 3x)

1/2 hr @ 220°C	min: no cracks
~~1/2 hr @ 240°C~~	~~typical: no cracks~~

Solderability
Not designed to be self-solderable

Stress Relief Temp: 160°C

MECHANICAL

Mandrel Flexibility

After Elongation	min: 20% 3x OK
	typical: 30% ~~1~~x OK
After Snap	min: 3x OK
	typical: ~~1~~x OK

Unilateral Scrape
Avg. of 3 tests (taken at 120° increments)
min: 1150 gms
typical: 1300 gms

Dynamic C of F typical: 0.06

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

ELECTRICAL

Pulse Endurance Test
20,000 Hz, 2000 V, 0.025 microsecond rise time
150°C, 50% Duty Cycle - Twisted pairs
18 HTAIH Reference = 600 seconds
18 HTAIHSD > 80,000 seconds

Pulse Endurance Index (PEI) > 100
Life of Product/Life of Same Size and Build MW-35 (Reference)

Dielectric Breakdown
NEMA min: 5.7 kV typical: 11 kV

Corona Inception Voltage
typical: 580 V

High Voltage Continuity
NEMA @ 1500 V DC: 5 faults/100 feet max
typical @ 2000 V DC: 0-1 faults/100 feet max

CHEMICAL

~~**Retained Dielectric**~~
~~After 72 hrs. exposure to R-22 + 150°C conditioning:~~
~~NEMA min: 5.7 kV~~
~~typical: 10.7 kV~~

~~**R-22 Extractables**: .08%~~

Resistance to Solvents
After 24 hrs. @ RT: Pass,
Solvents Including:
Xylene
50/50 Cellosolve/Xylene
Perchloroethylene
1% NaOH
28% Sulfuric Acid
Gasohol

Super Hyslik 220®

TAIHT

INSULATION ENGINEERING DETAIL

APPLICATIONS

Typical Applications

High speed motor windings with difficult insertion and winding characteristics, dry-type transformers, automotive alternator stators, solenoids

PRODUCT DESCRIPTION

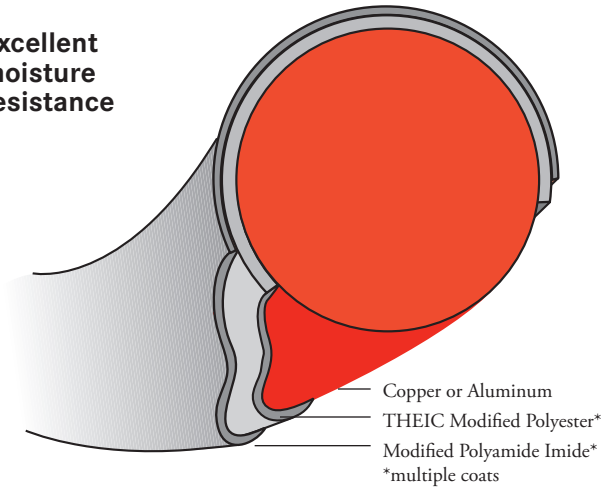
Thermal Class: 220 (Copper)

Improved dual insulation system, modified to optimize scrape resistance and surface lubricity

Basecoat - Excellent adhesion and flexibility
High thermal endurance
High temperature dielectric
Overload resistant
Resists thermoplastic flow

Topcoat - Improved surface toughness
Improved surface lubricity
Abrasion resistant
Heat shock resistant
Moisture resistant
Chemical resistant
Varnish craze resistant

Excellent moisture resistance



Improved windability and processibility

Specially engineered topcoat designed for improved surface lubricity and toughness

Superior performance in hermetics

(See chemical data)

GENERAL INFORMATION

References are provided for comparative purposes

Round

NEMA: MW 37-C
UL: File No. E37683

Rectangular

NEMA: MW 38-C

Availability

Round

Copper

Heavy 4-30 AWG

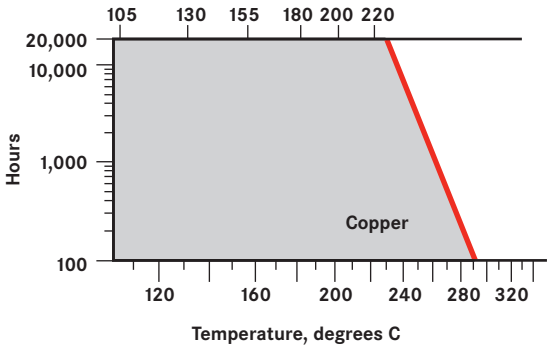
Rectangular

Copper

Min width	.081"
Max width	.750"
Min thickness	.030"
Max thickness	.292"

Measured Thermal Endurance

Expected Thermal Life (ASTM D 2307), 18 AWG, Heavy Build Insulation



TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance
20,000 hr Life: >220°C on Copper

Thermoplastic Flow
Min: 300°C typical: 350°C

Heat Shock (20% 3x)
1/2 hr @ 240°C no cracks

~~**Solderability**~~
~~@ 480°C (900°F): No~~

Stress Relief Temp 160°C

MECHANICAL

Mandrel Flexibility

After Elongation	min: 20% 3x OK typical: 30% 1x OK
After Snap	min: 3x OK typical: 1x OK

Unilateral Scrape

Avg. of 3 sides	min: 1150 gms typical: 1700 gms

Repeated Scrape

700 gms	min: 100 strokes typical: 200 strokes
Dynamic C of F	typical: 0.06

ELECTRICAL

Dielectric Breakdown
@ RT: 11 kV
@ 200°C: 7 kV

Insulation Resistance
@ RT: $5x10^{13}$ ohms
@ 200°C: $9.2x10^{10}$ ohms

Corona Inception Voltage
typical: 580 V

High Voltage DC Continuity
NEMA @ 1500 V DC: 5 faults/100 feet max
typical @ ~~3000~~ V DC: 0-1 faults/100 feet

CHEMICAL

Retained Dielectric after R-22
72 hrs + 300°C conditioning: 3.5 kV
72 hrs + 150°C conditioning: 10 kV

R-22 Extractables: <.08%

Resistance to Solvents
After 30 min in 60°C
Xylene
Butyl Cellosolve/Xylene

After 24 hours @ RT
Perchloroethylene
1% NaOH
28% Sulfuric Acid
Gasohol
And others

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

Pyre-ML®

ML

APPLICATIONS

Typical Applications

Dry-type transformers, traction motors, DC field coils, submersible pump motors

Very high temperature coils and relays

Encapsulated coils

Hermetically sealed relays

PRODUCT DESCRIPTION

Thermal Class: 240

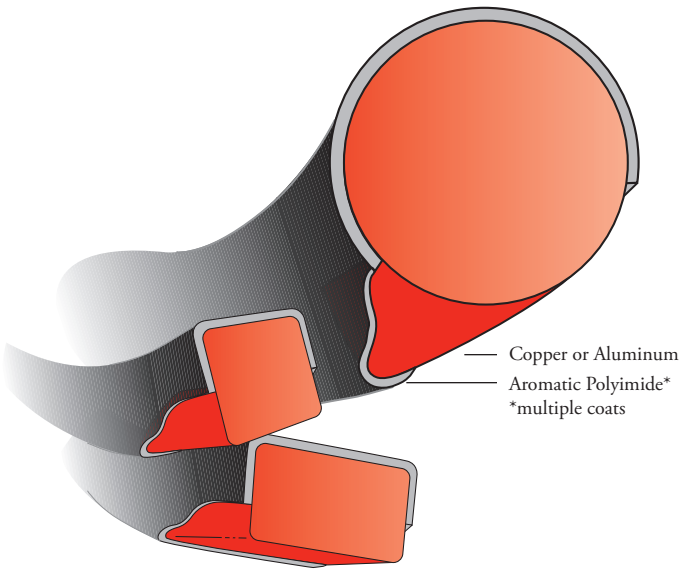
Extraordinary thermal and chemical stability

Highest overload resistance, cut thru resistance and operating temperature classification of any Rea film insulation

Exhibits high resistance to radiation

Minimum outgassing makes ML ideal for use in hermetically sealed coils and relays

Chemically compatible with the widest range of solvents, varnishes and encapsulating materials



GENERAL INFORMATION

References are provided for comparative purposes

Round

NEMA: MW 16-C, MW 71-C
UL: File No. E37683

Square & Rectangular

NEMA: MW 20-C
UL: File No. E37683

Availability

Round

Single, Heavy	14-31 AWG

Square

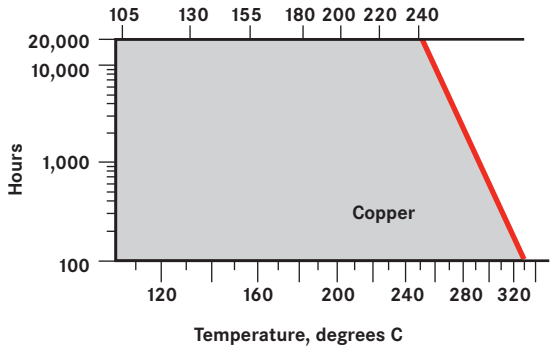
	2-10 AWG

Rectangular

Min width	.162"
Max width	.575"
Min thickness	.061"
Max thickness	.288"

MEASURED THERMAL ENDURANCE

18 AWG, Heavy Build Insulation



TYPICAL PROPERTIES

This data is typical of 18 AWG copper, heavy build insulation only. It is not intended to be used to create specification limits.

THERMAL

Thermal Endurance (*)
20,000 hr Life: >240°C

Thermoplastic Flow
Min: 450°C
typical: 500+°C

Heat Shock (20% 3x)
1/2 hr @ 280°C min: no cracks

~~**Solderability**~~
~~@ 480°C (900°F): No~~

Stress Relief Temp: 200°C

MECHANICAL

Mandrel Flexibility

After Elongation	min: 20% 3x OK
	typical: 30% 1x OK
After Snap	min: 3x OK
	typical: 1x OK

Unilateral Scrape

Avg. of 3 sides	min: 1150 gms
	typical: 1500 gms

ELECTRICAL

Dielectric Breakdown
@ RT: 12 kV
@ 220°C: 7 kV

High Voltage Continuity
NEMA @ 1500 V DC: 5 faults/100 feet max
typical @ ~~3000~~ 3 V DC: 0-1 faults/100 feet

CHEMICAL

Resistance to Solvents
After 24 hrs @ RT: Pass,

Solvents Including:
Xylene
50/50 Cellosolve/Xylene,
Perchloroethylene,
1% NaOH
28% Sulfuric Acid
Freon TMS

Procedure followed to determine published value:

NEMA = National Electrical Manufacturers Association
JIS = Japanese Industrial Standards
IEC = International Electrotechnical Commission
ASTM = American Society for Testing and Materials

APPLICATIONS

Typical Applications

Uniquely suitable for a wide variety of difficult winding and high reliability applications

PRODUCT DESCRIPTION

Thermal Class: 155

Available in a variety of constructions providing a wide range of temperature classifications and increased dielectric strengths (155°C, 180°C and 200°C)

Double Daglas over bare copper with modified epoxy varnish

Double or Single Daglas over Heavy Super Hyslik 200 with modified epoxy varnish

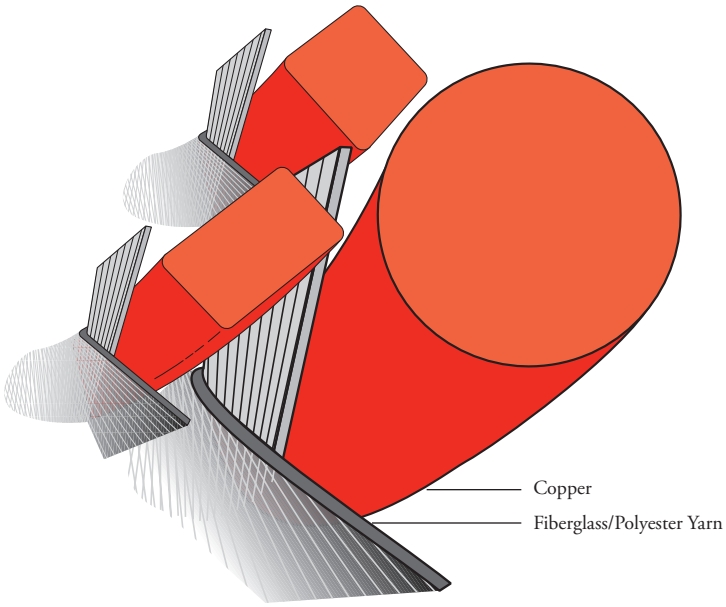
Double or Single Daglas over Heavy ML with modified epoxy varnish

Polyester fiber/glass fiber combination provides freedom from fraying and superior adhesion

Outstanding toughness

Machine windable

Daglas-film constructions provide improved electrical properties



GENERAL INFORMATION

Availability

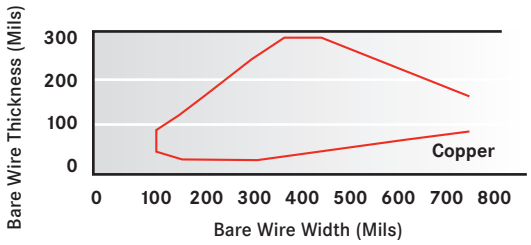
Round 1-18 AWG

(Daglas over single- and triple-build Super Hyslik 200 available 14-18 AWG)

Square 1-14 AWG

Rectangular See the following chart

NEMA SPECIFICATIONS	
Round	Rect. & Square
MW 45-C	MW 46-C



AWG Size	Nominal Bare Diameter	Round Wire							Square Wire						
		Bare Diameter		Min Daglas Addition		Max Overall Diameter			Bare Diameter		Min Daglas Addition		Max Overall Diameter		
		Min.	Max.	SIngle Daglas	Double Daglas	Bare Double Daglas	Heavy Single Daglas	Film Double Daglas	Min.	Max.	SIngle Daglas	Double Daglas	Bare Double Daglas	Heavy Single Daglas	Film Double Daglas
1	.2893	.2864	.2922	.0040	.0060	.3012			.2864	.2922	.0060	.0120	.3080	.3050	.3130
2	.2576	.2550	.2602	.0040	.0060	.2692			.2550	.2602	.0050	.0120	.2760	.2720	.2810
3	.2294	.2271	.2317	.0040	.0060	.2407			.2271	.2317	.0050	.0120	.2480	.2440	.2530
4	.2043	.2023	.2063	.0040	.0060	.2153	.2158	.2188	.2023	.2063	.0050	.0120	.2220	.2190	.2270
5	.1819	.1801	.1837	.0040	.0060	.1927	.1932	.1962	.1801	.1837	.0050	.0110	.1990	.1960	.2040
6	.1620	.1604	.1636	.0040	.0060	.1726	.1731	.1761	.1604	.1636	.0050	.0110	.1790	.1750	.1840
7	.1443	.1429	.1457	.0040	.0060	.1547	.1551	.1581	.1429	.1457	.0050	.0100	.1600	.1570	.1650
8	.1285	.1272	.1298	.0040	.0060	.1388	.1392	.1422	.1272	.1298	.0050	.0090	.1430	.1410	.1480
9	.1144	.1133	.1155	.0040	.0060	.1245	.1249	.1279	.1133	.1155	.0050	.0090	.1290	.1270	.1340
10	.1019	.1009	.1029	.0035	.0055	.1109	.1111	.1141	.1009	.1029	.0040	.0080	.1150	.1130	.1200
11	.0907	.0898	.0916	.0035	.0055	.0996	.0998	.1028	.0897	.0917	.0040	.0080	.1030	.1020	.1080
12	.0808	.0800	.0816	.0035	.0055	.0896	.0870	.0927	.0798	.0818	.0040	.0080	.0930	.0920	.0980
13	.0782	.0713	.0727	.0035	.0055	.0807	.0807	.0837	.0710	.0730	.0040	.0080	.0840	.0840	.0890
14	.0641	.0635	.0647	.0035	.0055	.0727	.0732	.0762	.0631	.0651	.0040	.0080	.0760	.0760	.0810
15	.0571	.0565	.0577	.0035	.0055	.0657	.0659	.0689							
16	.0508	.0503	.0513	.0035	.0055	.0593	.0595	.0625							
17	.0453	.0448	.0458	.0035	.0055	.0538	.0538	.0568							
18	.0403	.0399	.0407	.0035	.0055	.0487	.0487	.0517							

Rectangular Double Daglas Bare - Minimum and Maximum Additions to Bare Wire Thickness (inches)											
Bare Width Bare Thickness	.080 to .104	.105 to .118	.199 to .148	.149 to 167	.168 to .187	.188 to .209	.210 to .236	.237 to .264	.264 to .295	.296 to .335	.336 and over
.030 to .055	.008-.011	.008-.011	.008-.012	.009-.013	.009-.013	.010-.014	.010-.014	.010-.015	.010-.015	.010-.015	.011-.016
.056 to .079	.008-.011	.008-.011	.008-.012	.009-.013	.009-.013	.010-.014	.010-.014	.010-.015	.010-.015	.011-.016	.011-.016
.080 to .088	.008-.011	.008-.012	.008-.012	.009-.013	.009-.013	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016
.089 to .098	.008-.011	.008-.012	.008-.012	.009-.013	.010-.014	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016
.099 to .104	.008-.011	.008-.012	.009-.013	.010-.014	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016
.105 to .118	.008-.012	.009-.013	.010-.014	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016	011-.016
.119 to .124			.009-.013	.010-.014	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016
.125 to .148			.009-.013	.010-.014	.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016
.149 to .157				.010-.014	.010-.014	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016	.011-.016
.158 to .167				.010-.014	.010-.015	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016	.011-.016
.168 to .187					.010-.015	.010-.015	.011-.016	.011-.016	.011-.016	.011-.016	.011-.016
.188 & over						.010-.015	.011-.016	.011-.016	.011-.016	.011-.016	.011-.016

Rectangular Heavy Film Single Daglas Minimum and Maximum Additions to Bare Wire Thickness (inches)			
Bare Thickness			
.030 to .188	.119 to .187	.188 to .295	.296 & over
.007-.010	.008-.011	.008-.012	.009-.013

Addition to width will be equal to or less than thickness addition. For heavy film insulated wire, add .003" to the minimum addition and .005" to the maximum addition.

Reabond®M

RSI

APPLICATIONS

Typical Applications

Fractional and integral horsepower motors, including universal motor fields and induction motor stators, high temperature coils and solenoids

PRODUCT DESCRIPTION

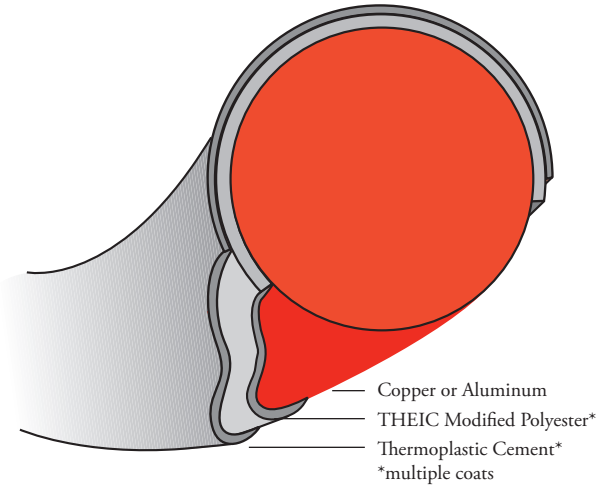
Thermal Class: 180

Cement forms a strong turn-to-turn bond throughout a winding and often eliminates the need for impregnating varnish

High resoftening temperature of outer cement allows this product to compete with many varnish-impregnated heavy-grade magnet wires

Retained bond strength @ 180°C

(3 lb. retained bond strength)



GENERAL INFORMATION

References are provided for comparative purposes

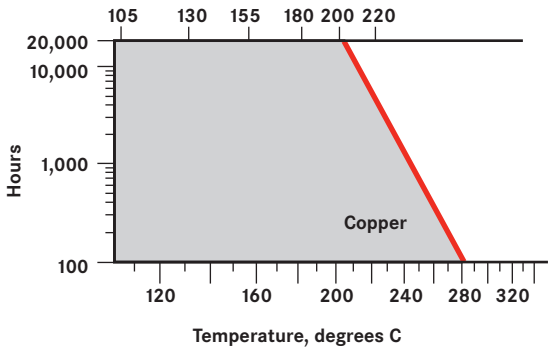
UL: File No. E37683

Availability

Copper	14-30 AWG
Aluminum	14-23 AWG

Measured Thermal Endurance

18 AWG Copper



Heat Bonding

Cost-optimized manufacturing processes typically employ resistance bonding to bond coils wound with Reabond M magnet wire. Solvent bonding is not recommended for this product. The Reabond cement may be removed by Dioxolane for measuring sub-film dimensions.

Bonding Conditions

Optimum bonding conditions are reached when the coil temperature is raised to between 220°C and 240°C as measured by the change in coil resistance as a function of the change in temperature. To avoid damage to any system component, materials must be chosen which will withstand process conditions.

Resistance Bonding

Resistance bonding applies a voltage that causes the winding to heat electrically to the proper bond temperature. The voltage that can be applied across a winding is limited by the current that can be passed through the wire. The current is determined by the applied voltage divided by the resistance of the winding. The maximum current that can be passed through a wire is limited by the gauge of wire (cross sectional area). The maximum voltage applied across the winding must be kept low enough so that the current does not approach the wire's fusion current (fusion current is the current at which a conductor will melt). The recommended bonding voltage should develop less than one-half the fusion current.

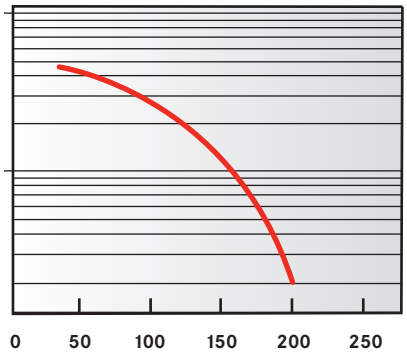
Fusion Current = If = Kd 3/2

Where, K = Constant = 10244 for Copper
and 7585 for Aluminum
d = bare wire diameter in inches
Current = Voltage/Resistance or I = Volts/Ohms

The bonding time is the time that the bonding voltage needs to be applied across the winding in order to generate the appropriate temperature. This will depend on the applied voltage and the total mass being heated and cooled. Therefore, the bonding time will need to be developed experimentally for each specific application. The process is very quick and may be completed on the winder without additional fixtures. This process may be automated fairly easily with very good results and control: however, there is a need for additional equipment that will deliver the desired time/voltage/current. This usually consists of a variable power supply, a timer, and special non-conductive winding arbors. There are many companies that sell automated resistance bonding power supplies and controllers. Electrical connection can usually be made by using an insulation piercing connector.

Bond Strength vs. Temperature

Bond Strength (lbs.)



Test Temperature, Degrees C
Helical Coils of 18 AWG Reabond M
(Resistance Bond @ 220°C plus 175°C Oven Bake)

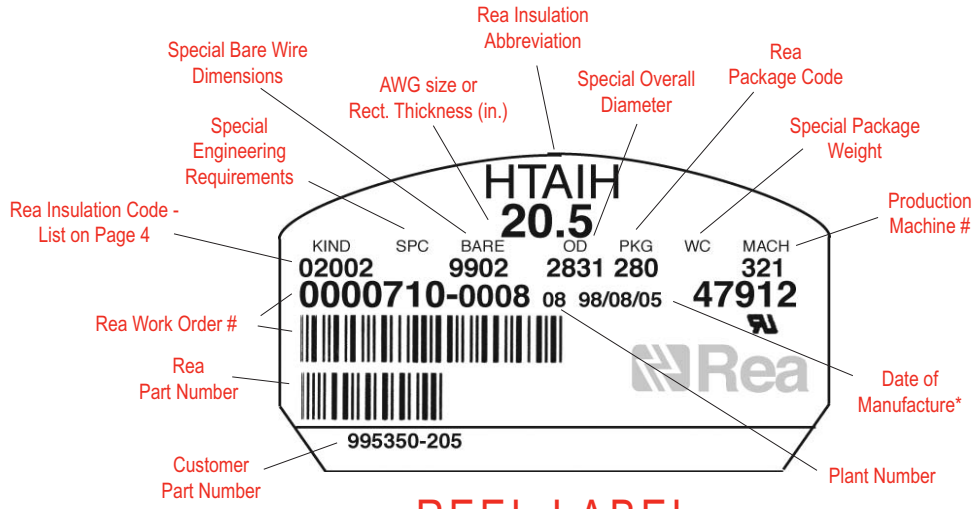
Packaging Options

PACKAGING SPECIFICATIONS

		Taper Pak							
Rea Package Code		**990**	**900**	**750**	**600**	**280**	**115**	**103**	**94**
Nominal Bore Diameter (in)		1 17/32	1 17/32	1 17/32	1 17/32	1 17/32	1 17/32	1 17/32	1 17/32
Length or Height (in)		30 11/32	29 9/32	26 3/16	26 3/16	15 5/16	13 3/8	13 3/8	10
Traverse or Diameter (in)		28 1/2	28 5/8	23 3/4	23 3/4	12	12	12	9
Barrel Diameter (in)	Top	-	7 1/2	8	8	8	6	6	5 3/4
	Bottom	9	8	9	9	9	7	7	6 1/2
Flange Diameter (in)	Top	17 7/8	17 13/16	16 1/2	15	15	10	10	8 1/2
	Bottom	19 1/2	19 11/32	19 1/2	16	16	11	11	9 1/4
Wire Weight (lb)	Cu	1000	1000	750	482	250	85	85	35
	Al	300	300	250	155	75	30	--	--
Package Tare Weight (lb)		19	22.3	15.3	12.9	8.9	2.9	5.7	1.65
Package/Carton		--	--	--	--	--	1	1/Pail	1
Cartons or Pkgs./Pallet		2,4	2,4,5	2,4	2,5	2,5	6,12	6,12	8,16

		Reels		Spools					
Rea Package Code		**245**	**121**	**DIN 160**	**066**	**060**	**050**	**030**	**025**
Nominal Bore Diameter (in)		1 17/32	1 17/32	28/32	5/8	5/8	5/8	5/8	5/8
Length or Height (in)		8 3/4	8 1/4	6 1/3	7	4 1/8	4 1/8	4	3 3/8
Traverse or Diameter (in)		6	7	5	6	3 1/2	3 1/2	3 1/2	3
Barrel Diameter (in)		14	6 17/32	3 7/8	3 3/4	3 1/2	3	1 3/4	1 3/4
Flange Diameter (in)	Top	24	11 3/4	6 1/3	6	6	5	3	2 1/2
	Bottom	24	11 3/4	6 1/3	6	6	5	3.15 / 3	2 1/2
Wire Weight (lb)	Cu	250	80	13	14	9	8	2	70-250 gr
	Al	90	25	-	--	--		--	--
Package Tare Weight (lb)		16.5	2.8	5.7	1.02	0.60	0.46	0.18	0.17
Package/Carton		--	--	4	4	8	8	9	9
Cartons or Pkgs./Pallet		4	6,12,18	8,16	8,16	6,12,18	6,12,18	--	--

Rea Package and Reel Labels



REEL LABEL

PACKAGE LABEL

* Date of manufacture on the reel label is the initial production start date of the work order. The date of manufacture on the package label indicates the day the reel was produced and weighed on the scale.

** Package Serial # - First two spaces are the plant number (08 = Lafayette) - Next 6 spaces are the date (yymmdd) - Last 4 spaces indicate the sequential reel number scaled on that date

*** Diameter tolerances are indicated as the last two digits of a minimun and maximum specification, i.e., 0.0651 to 0.0659 would be coded as 5159.

Dimensions - Square Magnet Wire

						Square Annealed Bare Copper				
AWG Size	Bare Diameter (in.)			Nominal Corner Radii	Area (sq. mils) Nom.	Weight lbs/1000 ft Nom.	Resistance @20°C (ohms/1000 ft.)			ohms/lb Nom.
	Min.	Nom.	Max.				Min. Dia.	Nom. Dia.	Max. Dia.	
0	0.322	0.325	0.328	0.040	104,187	401.5	0.080	0.078	0.077	0.000
1	0.286	0.289	0.292	0.040	82,321	317.3	0.101	0.099	0.097	0.000
2	0.255	0.258	0.260	0.040	64,985	250.5	0.128	0.125	0.123	0.001
3	0.227	0.229	0.232	0.040	51,251	197.5	0.162	0.159	0.156	0.001
4	0.202	0.204	0.206	0.040	40,365	155.6	0.206	0.202	0.198	0.001
5	0.180	0.182	0.184	0.040	31,715	122.2	0.262	0.257	0.252	0.002
6	0.160	0.162	0.164	0.032	25,365	97.8	0.328	0.321	0.315	0.003
7	0.143	0.144	0.146	0.032	19,943	76.9	0.417	0.408	0.400	0.005
8	0.127	0.129	0.130	0.032	15,633	60.3	0.532	0.521	0.510	0.009
9	0.113	0.114	0.116	0.026	12,507	48.2	0.665	0.651	0.638	0.014
10	0.101	0.102	0.103	0.026	9,804	37.8	0.848	0.831	0.814	0.022
11	0.090	0.091	0.092	0.020	7,883	30.4	1.057	1.033	1.010	0.034
12	0.080	0.081	0.082	0.020	6,186	23.8	1.352	1.317	1.283	0.055
13	0.071	0.072	0.073	0.016	4,964	19.1	1.690	1.641	1.594	0.086
14	0.063	0.064	0.065	0.016	3,889	15.0	2.166	2.095	2.027	0.140

Dimensions - Rectangular Magnet Wire

Bare Rectangular Conductor Tolerances

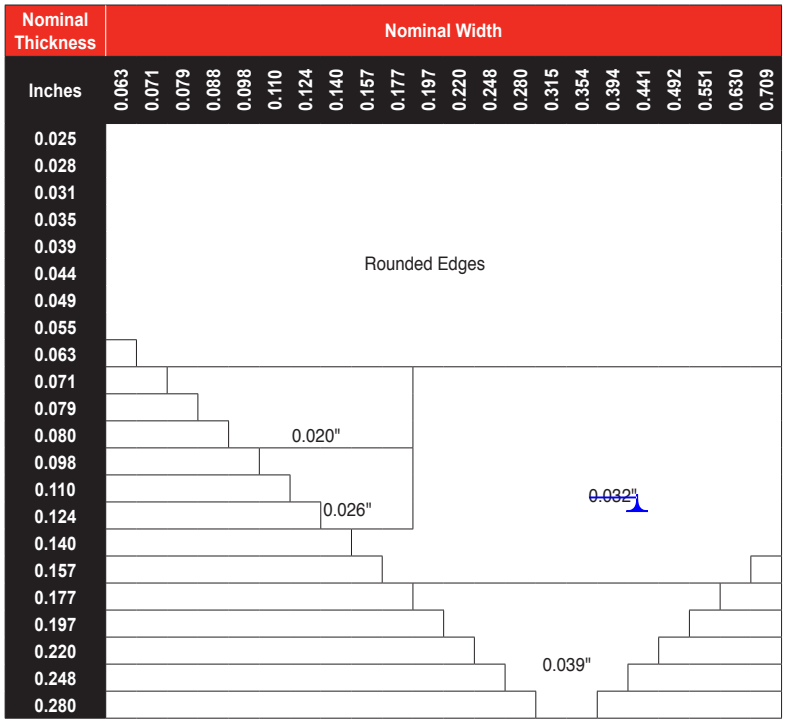
Nominal Thickness	Thickness Tolerance
Over 0.098 in.	± 1 percent
0.098 to 0.025 in.	± 0.001 in.
Nominal Width	**Width Tolerance**
Over 0.492 in.	± 1 percent
0.492 to 0.315 in.	± 0.003 in.
0.314 to 0.098 in.	± 1 percent
Under 0.098 in.	± 0.001 in.

Film Insulated Rectangular Heavy Build

Increase in width & thickness due to film coating		
	Minimum	Maximum
Increase in Width	0.0025	0.0045
Increase in Thickness	0.0030	0.0050

NOTE: The maximum increase may be exceeded provided the maximum overall dimension of the coated wire does not exceed the sum of the maximum dimension of the bare wire plus maximum increase due to coating.

Corner Radii for Rectangular Bare Wire

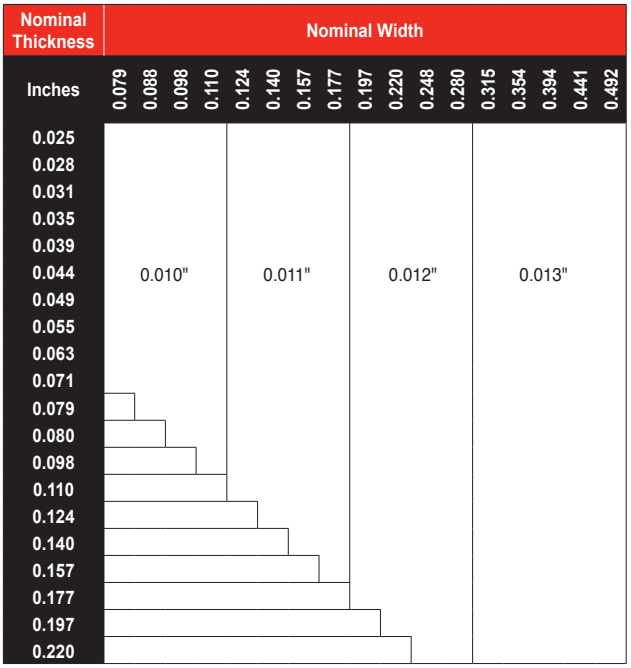


Radii tolerance is plus or minus 25 percent

Heavy Build Film Insulation				Double Dacron Glass Over Bare Wire		Single Dacron Glass Over Heavy Therm-Aimid		Double Dacron Glass Over Heavy Therm-Aimid		
Minimum Insulation increase (in.)	Overall Diameter (in.)			Minimum Insulation increase (in.)	Maximum Overall Dimensions (in.)	Minimum Insulation increase (in.)	Maximum Overall Dimensions (in.)	Minimum Insulation increase (in.)	Maximum Overall Dimensions (in.)	AWG Size
	Min.	Nom.	Max.							
0.0030	0.3247	0.3289	0.3331	0.012	0.344	0.009	0.341	0.015	0.349	**0**
0.0030	0.2894	0.2933	0.2972	0.012	0.308	0.009	0.305	0.015	0.313	**1**
0.0030	0.2580	0.2616	0.2652	0.012	0.276	0.008	0.272	0.015	0.281	**2**
0.0030	0.2301	0.2334	0.2367	0.012	0.248	0.008	0.244	0.015	0.253	**3**
0.0030	0.2053	0.2083	0.2113	0.012	0.222	0.008	0.219	0.015	0.227	**4**
0.0030	0.1831	0.1859	0.1887	0.011	0.199	0.008	0.196	0.014	0.204	**5**
0.0030	0.1634	0.1660	0.1686	0.011	0.179	0.008	0.175	0.014	0.184	**6**
0.0030	0.1459	0.1483	0.1507	0.010	0.160	0.008	0.157	0.013	0.165	**7**
0.0030	0.1302	0.1325	0.1348	0.009	0.143	0.008	0.141	0.012	0.148	**8**
0.0030	0.1163	0.1184	0.1205	0.009	0.129	0.008	0.127	0.012	0.134	**9**
0.0030	0.1039	0.1059	0.1079	0.008	0.115	0.007	0.113	0.011	0.120	**10**
0.0030	0.0927	0.0947	0.0967	0.008	0.103	0.007	0.102	0.011	0.108	**11**
0.0030	0.0828	0.0848	0.0868	0.008	0.093	0.007	0.092	0.011	0.098	**12**
0.0030	0.0740	0.0760	0.0780	0.008	0.084	0.007	0.084	0.011	0.089	**13**
0.0030	0.0661	0.0681	0.0701	0.008	0.076	0.007	0.076	0.011	0.081	**14**

Rectangular Single Dacron Glass Over Heavy Therm-Aimid

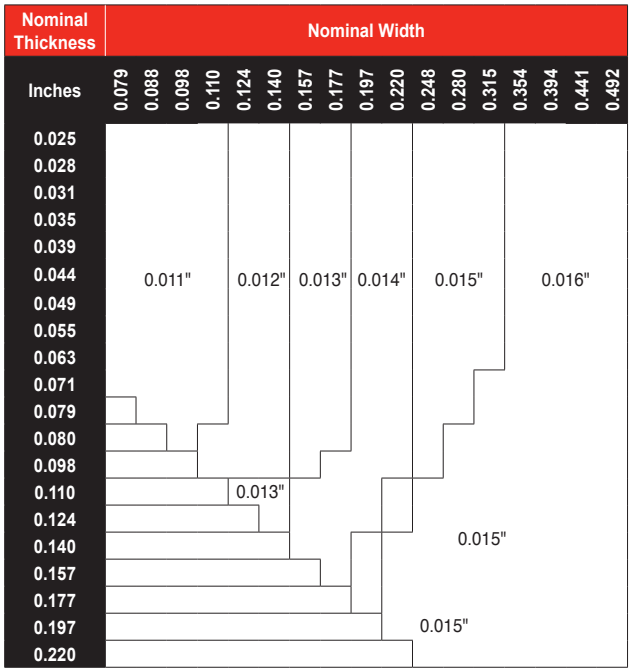
Maximum increase in thickness (inches) due to Single Dacron Glass covering, Heavy Therm-Aimid and Treating Varnish.



Note 1: The maximum increase due to the film and fiber covering shall be permitted to be exceeded provided the overall dimension of the covered wire does not exceed the sum of the maximum thickness of the bare wire plus the maximum increase due to the heavy film coating and single dacron glass fiber covering.
Note 2: The increase in thickness due to the heavy film coating shall be in accordance with the applicable section for film-coated wire.
Note 3: The increase in thickness due to the single dacron glass fiber covering shall be determined by subtracting 0.005 inches (maximum thickness of film coating) from the maximum increase in thickness given in the table.
Note 4: The increase in width due to the dacron glass fiber covering shall be equal to or less than the maximum increase in thickness given in the table. Note 1 applies to the increase in width as well as the increase in thickness.
Note 5: The total minimum increase shall be not less than 70 percent of the maximum increase given in the table above, rounded to the nearest 0.001 inches.

Rectangular Double Dacron Glass Over Bare Wire

Maximum increase in thickness (inches) due to Double Dacron Glass covering and Treating Varnish.



Note 1: The maximum increase due to the dacron glass fiber covering shall be permitted to be exceeded provided the overall dimension of the covered wire does not exceed the sum of the maximum thickness of the bare wire plus the maximum increase due to the dacron glass fiber covering.
Note 2: The maximum increase due to the dacron glass fiber covering shall be not less than 70 percent of the maximum shown in the table above, rounded to the nearest 0.001 inch.
Note 3: The increase in width due to the dacron glass fiber covering shall be equal to or less than the maximum increase in thickness given in the table. Note 1 applies to the increase in width as well as to the increase in thickness.

Rectangular Double Dacron Glass Over Heavy Therm-Aimid

Add 0.005 inches to the maximum increase in thickness denoted in the above table.

Dimensions - Copper, Round 0-30 AWG

AWG Size	Bare Diameter (in.)			Area Square Mils Nom.	Weight lb/1000 ft Nom.	Resistance @ 20°C (Ohms/1000 ft.)			Ohms/ lb Nom.	Single Build				
	Min.	Nom.	Max.			Min. Dia.	Nom. Dia.	Max. Dia.		Min. Increase	Nom. OD	Max. OD	Weight ft/lb Nom.	Ohms/ lb Nom.
0	0.3217	0.3249	0.3272	82,907	321	0.1002	0.0982	0.0969	0.000306					
1	0.2864	0.2893	0.2913	65,733	254.50	0.1264	0.1239	0.1222	0.000487					
2	0.2550	0.2576	0.2594	52,117	201.80	0.1595	0.1563	0.1541	0.000775					
3	0.2271	0.2294	0.2310	41,331	160.00	0.2011	0.1971	0.1943	0.00123					
4	0.2023	0.2043	0.2057	32,781	126.90	0.2534	0.2485	0.2450	0.00196					
5	0.1801	0.1819	0.1832	25,987	100.60	0.3197	0.3134	0.3091	0.00312					
6	0.1604	0.1620	0.1631	20,612	79.80	0.4031	0.3952	0.3897	0.00495					
7	0.1429	0.1443	0.1453	16,354	63.31	0.5079	0.4981	0.4912	0.00787					
8	0.1272	0.1285	0.1294	12,969	50.21	0.6410	0.6281	0.6194	0.0125	0.0017	0.1306	0.1314	19.81	0.0124
8½	0.1201	0.1213	0.1221	11,556	44.74	0.7190	0.7049	0.6951	0.0158	0.0017	0.1234	0.1241	22.23	0.0157
9	0.1133	0.1144	0.1153	10,279	39.79	0.8079	0.7924	0.7799	0.0199	0.0017	0.1165	0.1173	24.98	0.0198
9½	0.1069	0.1080	0.1089	9,161	35.47	0.9075	0.8891	0.8751	0.0251	0.0017	0.1101	0.1109	28.02	0.0249
10	0.1009	0.1019	0.1027	8,155	31.57	1.0187	0.9988	0.9830	0.0316	0.0017	0.1040	0.1047	31.47	0.0314
10½	0.0952	0.0962	0.0970	7,268	28.14	1.1443	1.1207	1.1029	0.0398	0.0017	0.0982	0.0990	35.30	0.0396
11	0.0898	0.0907	0.0914	6,461	25.01	1.2861	1.2607	1.2408	0.0504	0.0017	0.0927	0.0934	39.69	0.0500
11½	0.0847	0.0856	0.0863	5,755	22.28	1.4456	1.4154	1.3930	0.0635	0.0016	0.0875	0.0882	44.57	0.0631
12	0.0808	0.0808	0.0814	5,128	19.85	1.6205	1.5885	1.5634	0.0800	0.0016	0.0827	0.0833	50.00	0.0794
12½	0.0755	0.0763	0.0769	4,572	17.70	1.8194	1.7814	1.7533	0.1006	0.0016	0.0782	0.0788	56.05	0.0999
13	0.0713	0.0720	0.0726	4,072	15.76	2.0401	2.0006	1.9689	0.1269	0.0016	0.0738	0.0745	62.92	0.1259
13½	0.0672	0.0679	0.0684	3,621	14.02	2.2966	2.2495	2.2139	0.1605	0.0016	0.0697	0.0703	70.72	0.1591
14	0.0635	0.0641	0.0647	3,227	12.49	2.5720	2.5241	2.4775	0.2020	0.0016	0.0660	0.0666	79.30	0.2002
14½	0.0599	0.0605	0.0611	2,875	11.13	2.8905	2.8334	2.7780	0.2546	0.0016	0.0623	0.0629	89.00	0.2522
15	0.0565	0.0571	0.0577	2,561	9.91	3.2488	3.1809	3.1151	0.3209	0.0015	0.0588	0.0594	99.91	0.3178
15½	0.0534	0.0539	0.0544	2,282	8.83	3.6370	3.5698	3.5045	0.4041	0.0015	0.0557	0.0563	112.0	0.3999
16	0.0503	0.0508	0.0513	2,027	7.85	4.0991	4.0188	3.9408	0.5121	0.0014	0.0525	0.0531	126.1	0.5068
16½	0.0475	0.0480	0.0485	1,810	7.01	4.5966	4.5013	4.4090	0.6425	0.0014	0.0496	0.0502	141.2	0.6357
17	0.0448	0.0453	0.0458	1,612	6.24	5.1673	5.0539	4.9441	0.8099	0.0014	0.0469	0.0475	158.5	0.8008
17½	0.0423	0.0427	0.0431	1,432	5.54	5.7962	5.6881	5.5830	1.026	0.0013	0.0443	0.0449	178.3	1.014
18	0.0399	0.0403	0.0407	1,276	4.94	6.5144	6.3857	6.2608	1.293	0.0013	0.0418	0.0424	200.1	1.278
18½	0.0376	0.0380	0.0384	1,134	4.39	7.3358	7.1821	7.0333	1.636	0.0013	0.0395	0.0400	225.0	1.616
19	0.0355	0.0359	0.0363	1,012	3.92	8.2293	8.0470	7.8706	2.053	0.0012	0.0373	0.0379	252.0	2.028
19½	0.0336	0.0339	0.0342	903	3.49	9.1863	9.0245	8.8668	2.583	0.0012	0.0353	0.0359	282.4	2.548
20	0.0317	0.0320	0.0323	804	3.11	10.321	10.128	9.9407	3.253	0.0012	0.0335	0.0340	316.3	3.204
20½	0.0299	0.0302	0.0305	716	2.77	11.601	11.371	11.149	4.100	0.0011	0.0316	0.0321	355.2	4.039
21	0.0282	0.0285	0.0288	638	2.47	13.041	12.768	12.504	5.170	0.0011	0.0299	0.0303	398.7	5.091
21½	0.0266	0.0269	0.0272	568	2.20	14.657	14.332	14.018	6.514	0.0011	0.0283	0.0287	447.2	6.409
22	0.0253	0.0253	0.0256	503	1.95	16.594	16.202	15.825	8.325	0.0011	0.0266	0.0270	505.3	8.188
22½	0.0237	0.0239	0.0241	449	1.74	18.464	18.156	17.856	10.45	0.0010	0.0252	0.0257	565.7	10.27
23	0.0224	0.0226	0.0228	401	1.55	20.669	20.305	19.950	13.07	0.0010	0.0240	0.0243	631.5	12.82
23½	0.0211	0.0213	0.0215	356	1.38	23.295	22.859	22.436	16.57	0.0010	0.0227	0.0230	710.1	16.23
24	0.0199	0.0201	0.0203	317	1.23	26.189	25.670	25.167	20.90	0.0010	0.0214	0.0217	797.1	20.46
24½	0.0188	0.0190	0.0192	284	1.10	29.343	28.729	28.133	26.17	0.0009	0.0203	0.0206	891.8	25.62
25	0.0177	0.0179	0.0181	252	0.974	33.104	32.368	31.657	33.22	0.0009	0.0191	0.0194	1004	32.51
25½	0.0167	0.0169	0.0171	224	0.868	37.187	36.312	35.467	41.81	0.0009	0.0181	0.0184	1125	40.86
26	0.0157	0.0159	0.0161	199	0.769	42.075	41.023	40.010	53.37	0.0009	0.0171	0.0173	1271	52.12
26½	0.0149	0.0150	0.0152	177	0.684	46.714	46.093	44.888	67.37	0.0008	0.0162	0.0165	1426	65.71
27	0.0141	0.0142	0.0143	158	0.613	52.165	51.433	50.716	83.89	0.0008	0.0153	0.0156	1590	81.80
27½	0.0133	0.0134	0.0135	141	0.546	58.630	57.758	56.905	105.79	0.0008	0.0145	0.0148	1783	103.0
28	0.0125	0.0126	0.0127	125	0.483	66.374	65.325	64.300	135.32	0.0008	0.0137	0.0140	2013	131.5
28½	0.0118	0.0119	0.0120	111	0.431	74.483	73.236	72.021	170.08	0.0008	0.0130	0.0132	2256	165.2
29	0.0112	0.0113	0.0114	100	0.388	82.677	81.220	79.801	209.19	0.0007	0.0123	0.0126	2502	203.2
29½	0.0105	0.0106	0.0107	88	0.342	94.068	92.302	90.584	270.16	0.0007	0.0116	0.0118	2842	262.4
30	0.0099	0.010	0.0101	79	0.304	105.800	103.700	101.700	341.10	0.0007	0.0108	0.0112	3209	332.8

Heavy Build					Triple Build					Bondables		
Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Adhesive Minimum Increase Types 1, 2, 3	Maximum Winding Tension (lbs.)	AWG Size
0.0040	0.3294	0.3306	3.10	0.000305							1219	0
0.0039	0.2937	0.2951	3.91	0.000485							966	1
0.0038	0.2620	0.2634	4.93	0.000770							766	2
0.0038	0.2337	0.2351	6.21	0.00122							608	3
0.0037	0.2085	0.2098	7.83	0.00194							482	4
0.0036	0.1860	0.1873	9.87	0.00309							382	5
0.0036	0.1660	0.1672	12.43	0.00491							303	6
0.0035	0.1481	0.1492	15.66	0.00780							241	7
0.0035	0.1322	0.1332	19.73	0.0124							191	8
0.0034	0.1250	0.1258	22.14	0.0156							170	8 1/2
0.0034	0.1181	0.1181	24.87	0.0197							151	9
0.0034	0.1117	0.1117	27.89	0.0248							135	9 1/2
0.0034	0.1056	0.1056	31.31	0.0313							120	10
0.0033	0.0998	0.0998	35.11	0.0394							107	10 1/2
0.0033	0.0943	0.0943	39.47	0.0498							95.0	11
0.0033	0.0892	0.0892	44.29	0.0627							84.5	11 1/2
0.0032	0.0843	0.0843	49.68	0.0789							75.4	12
0.0032	0.0797	0.0797	55.68	0.0992							67.2	12 1/2
0.0032	0.0754	0.0754	62.49	0.1250							59.9	13
0.0032	0.0713	0.0713	70.20	0.1579							53.2	13 1/2
0.0032	0.0675	0.0675	78.70	0.1986	0.0048	0.0694	0.0698	77.93	0.1967	0.0006	47.5	14
0.0031	0.0638	0.0638	88.30	0.2502	0.0047	0.0657	0.0661	87.39	0.2476	0.0006	42.3	14 1/2
0.0030	0.0603	0.0603	99.08	0.3152	0.0046	0.0621	0.0625	98.02	0.3118	0.0006	37.6	15
0.0030	0.0571	0.0571	111.1	0.3965	0.0045	0.0588	0.0592	109.9	0.3923	0.0006	33.6	15 1/2
0.0029	0.0538	0.0538	125.0	0.5024	0.0043	0.0556	0.0560	123.6	0.4967	0.0006	29.8	16
0.0028	0.0509	0.0509	140.0	0.6301	0.0042	0.0526	0.0530	138.3	0.6227	0.0006	26.6	16 1/2
0.0028	0.0482	0.0482	157.0	0.7936	0.0041	0.0498	0.0502	155.1	0.7840	0.0006	23.6	17
0.0027	0.0455	0.0455	176.6	1.004	0.0040	0.0472	0.0476	174.3	0.9914	0.0006	21.1	17 1/2
0.0026	0.0430	0.0430	198.1	1.265	0.0039	0.0446	0.0450	195.5	1.249	0.0006	18.8	18
0.0025	0.0406	0.0406	222.7	1.600	0.0038	0.0422	0.0426	219.6	1.577	0.0006	16.7	18 1/2
0.0025	0.0385	0.0385	249.3	2.007	0.0037	0.0400	0.0404	245.8	1.978	0.0006	14.8	19
0.0024	0.0365	0.0365	279.1	2.519	0.0036	0.0379	0.0383	275.2	2.484	0.0006	13.3	19 1/2
0.0024	0.0346	0.0346	312.9	3.169	0.0035	0.0359	0.0363	308.5	3.124	0.0005	11.8	20
0.0023	0.0327	0.0327	351.2	3.993	0.0034	0.0340	0.0344	345.9	3.933	0.0005	10.5	20 1/2
0.0022	0.0309	0.0309	393.9	5.030	0.0034	0.0323	0.0326	387.6	4.949	0.0005	9.37	21
0.0022	0.0293	0.0293	441.7	6.331	0.0033	0.0306	0.0309	434.5	6.227	0.0005	8.34	21 1/2
0.0021	0.0276	0.0276	499.1	8.086	0.0032	0.0289	0.0292	490.4	7.946	0.0005	7.36	22
0.0021	0.0262	0.0262	558.3	10.14	0.0031	0.0274	0.0277	548.8	9.964	0.0005	6.62	22 1/2
0.0020	0.0248	0.0248	624.1	12.67	0.0030	0.0260	0.0263	612.9	12.44	0.0005	5.91	23
0.0020	0.0235	0.0235	701.3	16.03	0.0030	0.0246	0.0249	688.4	15.74	0.0005	5.25	23 1/2
0.0019	0.0222	0.0222	787.2	20.21	0.0029	0.0233	0.0236	771.9	19.81	0.0005	4.67	24
0.0019	0.0211	0.0211	878.5	25.24	0.0028	0.0221	0.0224	862.6	24.78	0.0005	4.16	24 1/2
0.0018	0.0199	0.0199	989.3	32.02	0.0027	0.0209	0.0212	970.4	31.41	0.0005	3.69	25
0.0018	0.0189	0.0189	1107	40.21	0.0027	0.0199	0.0202	1084.9	39.39	0.0005	3.29	25 1/2
0.0017	0.0178	0.0178	1251	51.30	0.0026	0.0188	0.0191	1223.5	50.19	0.0005	2.90	26
0.0017	0.0169	0.0169	1402	64.61	0.0025	0.0179	0.0182	1371.0	63.20	0.0005	2.62	26 1/2
0.0016	0.0161	0.0161	1562	80.35	0.0025	0.0170	0.0173	1526.0	78.49	0.0005	2.34	27
0.0016	0.0152	0.0152	1752	101.2	0.0024	0.0161	0.0164	1711.0	98.82	0.0005	2.08	27 1/2
0.0016	0.0144	0.0144	1978	129.2	0.0023	0.0152	0.0155	1931.8	126.20	0.0005	1.84	28
0.0015	0.0136	0.0136	2215	162.2	0.0023	0.0145	0.0147	2159.6	158.16	0.0005	1.64	28 1/2
0.0015	0.0130	0.0130	2453	199.3	0.0022	0.0138	0.0141	2389.1	194.04	0.0004	1.48	29
0.0014	0.0122	0.0122	2783	256.9	0.0022	0.0131	0.0133	2705.4	249.71	0.0004	1.30	29 1/2
0.0013	0.0114	0.0119	3139	325.6	0.0020	0.0122	0.0128	3052.0	316.50	0.0004	1.15	30

Dimensions - Copper, Round 30½-46 AWG

AWG Size	Bare Diameter (in.)			Area Square Mils Nom.	Weight lb/1000 ft Nom.	(Ohms/1000 ft.)			Ohms/ lb Nom.	Single Build				
	Min.	Nom.	Max.			Min. Dia.	Nom. Dia.	Max.Dia.		Min. Increase	Nom. OD	Max. OD	Weight ft/lb Nom.	Ohms/ lb Nom.
30½	0.0094	0.0095	0.0096	70.9	0.274	117.4	114.9	112.5	418.8	0.0006	0.0102	0.0106	3564	409.5
31	0.0088	0.0089	0.0090	62.2	0.241	133.9	130.9	128.0	543.6	0.0006	0.0096	0.0100	4054	530.8
31½	0.0083	0.0084	0.0085	55.4	0.215	150.5	147.0	143.5	685.1	0.0006	0.0091	0.0095	4545	668.0
32	0.0079	0.0080	0.0081	50.3	0.195	166.2	162.0	158.1	832.7	0.0006	0.0087	0.0091	5004	810.9
32½	0.0074	0.0075	0.0076	44.2	0.171	189.4	184.4	179.6	1078	0.0005	0.0081	0.0085	5709	1053
32	0.0070	0.0071	0.0072	39.6	0.153	211.7	205.7	200.1	1342	0.0005	0.0077	0.0081	6361	1309
33½	0.0066	0.0067	0.0068	35.3	0.136	238.1	231.0	224.3	1693	0.0005	0.0073	0.0077	7133	1648
34	0.0062	0.0063	0.0064	31.2	0.121	269.8	261.3	253.2	2165	0.0005	0.0068	0.0072	8074	2110
34½	0.0058	0.0059	0.0060	27.3	0.106	308.3	297.9	288.1	2815	0.0004	0.0064	0.0067	9190	2738
35	0.0055	0.0056	0.0057	24.6	0.0954	342.8	330.7	319.2	3468	0.0004	0.0061	0.0064	10185	3368
35½	0.0052	0.0053	0.0054	22.1	0.0854	383.5	369.2	355.7	4323	0.0004	0.0058	0.0061	11352	4191
36	0.0049	0.0050	0.0051	19.6	0.0760	431.9	414.8	398.7	5457	0.0004	0.0055	0.0058	12730	5281
36½	0.0046	0.0047	0.0048	17.3	0.0672	490.1	469.5	450.1	6990	0.0004	0.0052	0.0055	14376	6749
37	0.0044	0.0045	0.0046	15.9	0.0616	535.7	512.1	490.1	8318	0.0004	0.0050	0.0053	15657	8019
37½	0.0041	0.0042	0.0043	13.9	0.0536	617.0	587.9	560.9	10961	0.0003	0.0046	0.0049	18071	10624
38	0.0039	0.0040	0.0041	12.6	0.0487	681.9	648.2	617.0	13323	0.0003	0.0044	0.0047	19891	12893
38½	0.0036	0.0037	0.0038	10.8	0.0416	800.2	757.6	718.2	18199	0.0003	0.0041	0.0044	23184	17563
39	0.0034	0.0035	0.0036	9.62	0.0372	897.1	846.6	800.2	22729	0.0003	0.0039	0.0041	25980	21995
39½	0.0032	0.0033	0.0034	8.55	0.0331	1013	952.3	897.1	28760	0.0003	0.0037	0.0039	29165	27775
40	0.0030	0.0031	0.0032	7.55	0.0292	1152	1079	1013	36932	0.0003	0.0035	0.0037	32973	35584
40½	0.0029	0.0030	0.0031	7.07	0.0274	1233	1152	1079	42108	0.0003	0.0034	0.0036	35162	40519
41	0.0027	0.0028	0.0029	6.16	0.0238	1423	1323	1233	55490	0.0003	0.0032	0.0034	40250	53244
41½	0.0025	0.0026	0.0027	5.31	0.0206	1659	1534	1423	74637	0.0002	0.0029	0.0032	46834	71852
42	0.0024	0.0025	0.0026	4.91	0.0190	1801	1659	1534	87315	0.0002	0.0028	0.0030	50921	84497
42½	0.0023	0.0024	0.0025	4.52	0.0175	1960	1801	1659	102803	0.0002	0.0027	0.0029	55175	99344
43	0.0021	0.0022	0.0023	3.80	0.0147	2352	2143	1960	145599	0.0002	0.0024	0.0026	65958	141332
44	0.0019	0.0020	0.0021	3.14	0.0122	2873	2593	2352	213172	0.0002	0.0022	0.0024	79564	206291
45	0.00169	0.00176	0.00183	2.43	0.00942	3616	3348	3080	355467	0.0002	0.0020	0.0022	101872	341076
46	0.00151	0.00157	0.00163	1.94	0.00749	4544	4207	3871	561372	0.0002	0.0018	0.0020	127496	536438

Dimensions - Copper, Round 37-56 AWG

AWG Size	Theoretical Bare Diameter			Area Square Mils Nom.	Weight gr/1000 ft Nom.	(Ohms/1000 ft.)			Ohms/ lb Nom.	Single Build				
	Min.	Nom.	Max.			Min. Dia.	Nom. Dia.	Max.Dia.		Min. Increase	Nom. OD	Max. OD	Weight ft/gm Nom.	Ohms/ gm Nom.
47	0.00134	0.00140	0.00146	1.54	2.70	5.715	5.291	4.868	1957	0.0001	0.00155	0.0017	358.2	1895
48	0.00119	0.00124	0.00129	1.21	2.12	7.285	6.745	6.205	3180	0.0001	0.00137	0.0015	456.9	3082
49	0.00107	0.00111	0.00115	0.968	1.70	9.091	8.417	7.744	4953	0.0001	0.00121	0.0013	573.6	4828
50	0.00095	0.00099	0.00103	0.770	1.35	11.43	10.58	9.735	7828	0.0001	0.00110	0.0012	716.5	7581
51	0.00084	0.00088	0.00092	0.608	1.07	14.46	13.39	12.32	12539	0.0001	0.00100	0.0011	898.2	12029
52	0.00075	0.00078	0.00081	0.478	0.839	18.41	17.05	15.68	20314	0.0001	0.00090	0.0010	1136.9	19380
53	0.00067	0.00070	0.00073	0.385	0.676	22.86	21.17	19.47	31317	0.00005	0.00077	0.00085	1435.8	30389
54	0.00060	0.00062	0.00064	0.302	0.530	29.14	26.98	24.82	50887	0.00005	0.00068	0.00075	1832.1	49429
55	0.00053	0.00055	0.00057	0.238	0.417	37.03	34.28	31.54	82172	0.00005	0.00062	0.00070	2306.0	79060
56	0.00047	0.00049	0.00051	0.189	0.331	46.65	43.19	39.74	130434	0.00005	0.00057	0.00065	2881.6	124470

Heavy Build					Triple Build					Bondables		
Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Adhesive Minimum Increase Types 1, 2, 3	Maximum Winding Tension (grams)	AWG Size
0.0013	0.0109	0.0114	3470	398.7	0.0019	0.0117	0.0123	3374	387.7	0.0004	472	**30 1/2**
0.0012	0.0103	0.0108	3947	516.8	0.0018	0.0109	0.0114	3854	504.6	0.0004	414	**31**
0.0012	0.0098	0.0103	4417	649.3	0.0017	0.0103	0.0109	4316	634.3	0.0004	368	**31 1/2**
0.0011	0.0093	0.0098	4878	790.4	0.0017	0.0098	0.0103	4760	771.4	0.0004	334	**32**
0.0011	0.0088	0.0093	5529	1019	0.0016	0.0093	0.0098	5400	995.6	0.0004	293	**32 1/2**
0.0010	0.0083	0.0088	6180	1271	0.0015	0.0087	0.0092	6043	1243	0.0003	262	**33**
0.0010	0.0079	0.0084	6917	1598	0.0015	0.0083	0.0088	6753	1560	0.0003	233	**33 1/2**
0.0009	0.0073	0.0078	7858	2053	0.0014	0.0078	0.0082	7661	2002	0.0003	205	**34**
0.0009	0.0069	0.0074	8926	2659	0.0013	0.0073	0.0078	8713	2596	0.0003	180	**34 1/2**
0.0009	0.0066	0.0070	9908	3277	0.0013	0.0070	0.0074	9658	3194	0.0003	162	**35**
0.0008	0.0062	0.0067	11061	4084	0.0012	0.0066	0.0071	10766	3975	0.0003	144	**35 1/2**
0.0008	0.0059	0.0063	12427	5155	0.0012	0.0063	0.0067	12076	5010	0.0003	128	**36**
0.0007	0.0055	0.0060	14063	6602	0.0011	0.0059	0.0064	13640	6404	0.0003	113	**36 1/2**
0.0007	0.0053	0.0057	15360	7866	0.0011	0.0057	0.0060	14818	7589	0.0003	103	**37**
0.0007	0.0050	0.0054	17559	10323	0.0010	0.0054	0.0057	16966	9975	0.0003	90	**37 1/2**
0.0007	0.0047	0.0051	19383	12564	0.0010	0.0051	0.0054	18697	12119	0.0002	81	**38**
0.0006	0.0044	0.0048	22648	17157	0.0009	0.0048	0.0051	21781	16500	0.0002	69	**38 1/2**
0.0006	0.0042	0.0045	25093	21244	0.0009	0.0045	0.0048	24324	20593	0.0002	62	**39**
0.0006	0.0040	0.0043	28105	26765	0.0009	0.0043	0.0046	27186	25890	0.0002	55	**39 1/2**
0.0005	0.0037	0.0040	32060	34599	0.0008	0.0040	0.0043	30953	33404	0.0002	48	**40**
0.0005	0.0036	0.0038	34357	39591	0.0008	0.0039	0.0041	33136	38184	0.0002	45	**40 1/2**
0.0005	0.0034	0.0036	39258	51932	0.0008	0.0037	0.0040	37503	49611	0.0002	39	**41**
0.0005	0.0032	0.0034	45285	69475	0.0007	0.0035	0.0038	43405	66591	0.0002	33	**41 1/2**
0.0005	0.0031	0.0033	48832	81029	0.0007	0.0033	0.0036	47069	78105	0.0002	31	**42**
0.0005	0.0029	0.0031	53208	95802	0.0007	0.0032	0.0034	51217	92218	0.0002	28	**42 1/2**
0.0004	0.0027	0.0029	63408	135868	0.0006	0.0029	0.0032	60823	130330	0.0001	24	**43**
0.0004	0.0025	0.0027	76162	197469	0.0006	0.0027	0.0030	72718	188540	0.0001	19	**44**
0.0004	0.0022	0.0024	97866	327663	0.0005	0.0024	0.0027	93822	314122	0.0001	15	**45**
0.0003	0.0019	0.0021	124679	524583	0.0005	0.0021	0.0024	117564	494648	0.0001	12	**46**

Heavy Build					Triple Build					Bondables		
Minimum Insulation Increase (in.)	Nom.	Max	Weight (ft/lb) Nom.	ohms/lb. Nom.	Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/gm) Nom.	ohms/ gm. Nom.	Adhesive Minimum Increase Types 1, 2, 3	Maximum Winding Tension (grams)	AWG Size
0.0003	0.00170	0.00190	344.0	1820						0.0001	11.5	**47**
0.0002	0.00147	0.00170	443.0	2988						0.0001	9.1	**48**
0.0002	0.00136	0.00150	545.9	4595						0.0001	7.3	**49**
0.0002	0.00125	0.00140	677.2	7166						0.0001	5.8	**50**
0.0002	0.00114	0.00129	847.0	11343						0.0001	4.5	**51**
0.0002	0.00102	0.00115	1073	18299						0.00005	3.6	**52**
0.0001	0.00089	0.00103	1351	28599							2.9	**53**
0.0001	0.00081	0.00095	1701	45889							2.3	**54**
0.0001	0.00073	0.00087	2138	73304							1.8	**55**
0.0001	0.00067	0.00081	2653	114604							1.4	**56**

Dimensions - Aluminum, Round 0-30 AWG

AWG Size	Bare Diameter (in.)			Area Square Mils Nom.	Weight lb/1000 ft Nom.	Resistance @ 20°C (Ohms/1000 ft.)			Ohms/ lb Nom.	Single Build				
	Min.	Nom.	Max.			Min. Dia.	Nom. Dia.	Max. Dia.		Min. Increase	Nom. OD	Max. OD	Weight ft/lb Nom.	Ohms/ lb Nom.
0	0.3217	0.3249	0.3272	82,907	97.12	0.1622	0.1590	0.1568	0.00164					
1	0.2864	0.2893	0.2913	65,733	77.00	0.2046	0.2005	0.1977	0.00260					
2	0.2550	0.2576	0.2594	52,117	61.05	0.2581	0.2529	0.2494	0.00414					
3	0.2271	0.2294	0.2310	41,331	48.42	0.3254	0.3189	0.3145	0.00659					
4	0.2023	0.2043	0.2057	32,781	38.40	0.4101	0.4021	0.3965	0.0105					
5	0.1801	0.1819	0.1832	25,987	30.44	0.5174	0.5072	0.5002	0.0167					
6	0.1604	0.1620	0.1631	20,612	24.15	0.6523	0.6395	0.6306	0.0265					
7	0.1429	0.1443	0.1453	16,354	19.16	0.8218	0.8060	0.7948	0.0421					
8	0.1272	0.1285	0.1294	12,969	15.19	1.037	1.016	1.002	0.0669	0.0017	0.1306	0.1314	64.71	0.0658
8 1/2	0.1201	0.1213	0.1221	11,556	13.54	1.164	1.141	1.125	0.0843	0.0017	0.1234	0.1241	72.56	0.0828
9	0.1133	0.1144	0.1153	10,279	12.04	1.307	1.282	1.262	0.106	0.0017	0.1165	0.1173	81.46	0.1045
9 1/2	0.1069	0.1080	0.1089	9,161	10.73	1.469	1.439	1.416	0.134	0.0017	0.1101	0.1109	91.32	0.1314
10	0.1009	0.1019	0.1027	8,155	9.56	1.648	1.616	1.591	0.169	0.0017	0.1040	0.1047	102.5	0.1656
10 1/2	0.0952	0.0962	0.0970	7,268	8.52	1.852	1.813	1.785	0.213	0.0017	0.0982	0.0990	114.9	0.2083
11	0.0898	0.0907	0.0914	6,461	7.57	2.081	2.040	2.008	0.270	0.0017	0.0927	0.0934	129.1	0.2633
11 1/2	0.0847	0.0856	0.0863	5,755	6.74	2.339	2.290	2.254	0.340	0.0016	0.0875	0.0882	144.9	0.3320
12	0.0800	0.0808	0.0814	5,128	6.01	2.622	2.571	2.530	0.428	0.0016	0.0827	0.0833	162.5	0.4177
12 1/2	0.0755	0.0763	0.0769	4,572	5.36	2.944	2.883	2.837	0.538	0.0016	0.0782	0.0788	182.0	0.5246
13	0.0713	0.0720	0.0726	4,072	4.77	3.301	3.237	3.186	0.679	0.0016	0.0738	0.0745	204.1	0.6608
13 1/2	0.0672	0.0679	0.0684	3,621	4.24	3.716	3.640	3.582	0.858	0.0016	0.0697	0.0703	229.2	0.8343
14	0.0635	0.0641	0.0647	3,227	3.78	4.162	4.084	4.009	1.080	0.0016	0.0660	0.0666	256.6	1.048
14 1/2	0.0599	0.0605	0.0611	2,875	3.37	4.677	4.585	4.495	1.362	0.0016	0.0623	0.0629	287.8	1.320
15	0.0565	0.0571	0.0577	2,561	3.00	5.257	5.147	5.041	1.716	0.0015	0.0588	0.0594	323.1	1.663
15 1/2	0.0534	0.0539	0.0544	2,282	2.67	5.885	5.777	5.671	2.161	0.0015	0.0557	0.0563	361.6	2.089
16	0.0503	0.0508	0.0513	2,027	2.38	6.633	6.503	6.377	2.739	0.0014	0.0525	0.0531	407.1	2.647
16 1/2	0.0475	0.0480	0.0485	1,810	2.12	7.438	7.284	7.134	3.436	0.0014	0.0496	0.0502	455.5	3.318
17	0.0448	0.0453	0.0458	1,612	1.89	8.362	8.178	8.000	4.332	0.0014	0.0469	0.0475	510.4	4.174
17 1/2	0.0423	0.0427	0.0431	1,432	1.68	9.379	9.204	9.034	5.487	0.0013	0.0443	0.0449	573.9	5.282
18	0.0399	0.0403	0.0407	1,276	1.50	10.54	10.33	10.13	6.915	0.0013	0.0418	0.0424	643.6	6.651
18 1/2	0.0376	0.0380	0.0384	1,134	1.33	11.87	11.62	11.38	8.748	0.0013	0.0395	0.0400	723.2	8.405
19	0.0355	0.0359	0.0363	1,012	1.19	13.32	13.02	12.74	10.98	0.0012	0.0373	0.0379	809.6	10.54
19 1/2	0.0336	0.0339	0.0342	903	1.06	14.87	14.60	14.35	13.81	0.0012	0.0353	0.0359	905.7	13.23
20	0.0317	0.0320	0.0323	804	0.942	16.70	16.39	16.09	17.40	0.0012	0.0335	0.0340	1010.6	16.56
20 1/2	0.0299	0.0302	0.0305	716	0.839	18.77	18.40	18.04	21.93	0.0011	0.0316	0.0321	1135.2	20.89
21	0.0282	0.0285	0.0288	638	0.748	21.10	20.66	20.23	27.65	0.0011	0.0299	0.0303	1273.3	26.31
21 1/2	0.0266	0.0269	0.0272	568	0.666	23.72	23.19	22.68	34.84	0.0011	0.0283	0.0287	1425.1	33.05
22	0.0250	0.0253	0.0256	503	0.589	26.85	26.22	25.61	44.52	0.0011	0.0266	0.0270	1609.0	42.19
22 1/2	0.0237	0.0239	0.0241	449	0.526	29.88	29.38	28.89	55.91	0.0010	0.0252	0.0257	1797.4	52.81
23	0.0224	0.0226	0.0228	401	0.470	33.45	32.86	32.28	69.92	0.0010	0.0240	0.0243	1998.9	65.68
23 1/2	0.0211	0.0213	0.0215	356	0.417	37.70	36.99	36.31	88.62	0.0010	0.0227	0.0230	2241.8	82.93
24	0.0199	0.0201	0.0203	317	0.372	42.38	41.54	40.72	111.8	0.0010	0.0214	0.0217	2514.1	104.4
24 1/2	0.0188	0.0190	0.0192	284	0.332	47.48	46.49	45.52	140.0	0.0009	0.0203	0.0206	2810.4	130.6
25	0.0177	0.0179	0.0181	252	0.295	53.57	52.38	51.23	177.7	0.0009	0.0191	0.0194	3162	165.6
25 1/2	0.0167	0.0169	0.0171	224	0.263	60.17	58.76	57.39	223.6	0.0009	0.0181	0.0184	3533	207.6
26	0.0157	0.0159	0.0161	199	0.233	68.08	66.38	64.74	285.4	0.0009	0.0171	0.0173	3986	264.6
26 1/2	0.0149	0.0150	0.0152	177	0.207	75.59	74.59	73.60	360.3	0.0008	0.0162	0.0165	4458	332.5
27	0.0141	0.0142	0.0143	158	0.186	84.41	83.23	82.07	448.6	0.0008	0.0153	0.0156	4971	413.7
27 1/2	0.0133	0.0134	0.0135	141	0.165	94.87	93.46	92.08	565.7	0.0008	0.0145	0.0148	5555	519.2
28	0.0125	0.0126	0.0127	125	0.146	107.40	105.71	104.05	723.7	0.0008	0.0137	0.0140	6249	660.5
28 1/2	0.0118	0.0119	0.0120	111	0.130	120.53	118.51	116.54	909.6	0.0008	0.0130	0.0132	6999	829.4
29	0.0112	0.0113	0.0114	100	0.117	133.79	131.43	129.13	1119	0.0007	0.0123	0.0126	7759	1020
29 1/2	0.0105	0.0106	0.0107	88	0.103	152.22	149.36	146.58	1445	0.0007	0.0116	0.0118	8808	1316
30	0.0099	0.0100	0.0101	79	0.092	171.23	167.82	164.51	1824	0.0007	0.0110	0.0112	9841	1652

Heavy Build					Triple Build					Bondables		
Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Minimum Insulation Increase (in.)	Nom.	Max.	Weight (ft/lb) Nom.	ohms/lb. Nom.	Adhesive Minimum Increase Types 1, 2, 3	Maximum Winding Tension (lbs.)	AWG Size
0.0040	0.3294	0.3306	10.15	0.001614							228.0	0
0.0039	0.2937	0.2951	12.78	0.002562							180.0	1
0.0038	0.2620	0.2634	16.09	0.004069							143.0	2
0.0038	0.2337	0.2351	20.25	0.00646							113.0	3
0.0037	0.2085	0.2098	25.48	0.01025							90.0	4
0.0037	0.1860	0.1873	32.07	0.01627							71.3	5
0.0036	0.1660	0.1672	40.36	0.02581							56.6	6
0.0035	0.1481	0.1492	50.78	0.04092							44.9	7
0.0035	0.1332	0.1332	63.87	0.0649							35.6	8
0.0034	0.1258	0.1258	71.57	0.0816							31.7	8 1/2
0.0034	0.1181	0.1190	80.28	0.1029							28.2	9
0.0034	0.1117	0.1125	89.92	0.1294							25.1	9 1/2
0.0034	0.1056	0.1064	100.8	0.1629							22.4	10
0.0033	0.0998	0.1007	113.0	0.2048							19.9	10 1/2
0.0033	0.0943	0.0952	126.7	0.2586							17.7	11
0.0033	0.0892	0.0900	142.0	0.3252							15.8	11 1/2
0.0032	0.0843	0.0851	159.2	0.4091							14.1	12
0.0032	0.0797	0.0805	178.2	0.5136							12.6	12 1/2
0.0032	0.0754	0.0762	199.6	0.6462							11.2	13
0.0032	0.0713	0.0720	223.8	0.8148							9.93	13 1/2
0.0032	0.0675	0.0682	250.4	1.023	0.0048	0.0694	0.0698	242.8	0.9917	0.0006	8.87	14
0.0031	0.0638	0.0645	280.7	1.287	0.0047	0.0657	0.0661	271.6	1.245	0.0006	7.89	14 1/2
0.0030	0.0603	0.0610	314.6	1.620	0.0046	0.0621	0.0625	304.2	1.566	0.0006	7.02	15
0.0030	0.0571	0.0578	351.9	2.033	0.0045	0.0588	0.0592	340.2	1.965	0.0006	6.27	15 1/2
0.0029	0.0538	0.0545	395.9	2.575	0.0043	0.0556	0.0560	381.9	2.484	0.0006	5.56	16
0.0028	0.0509	0.0516	442.8	3.225	0.0042	0.0526	0.0530	426.8	3.108	0.0006	4.96	16 1/2
0.0028	0.0482	0.0488	495.9	4.055	0.0041	0.0498	0.0502	477.4	3.904	0.0006	4.41	17
0.0027	0.0455	0.0462	556.6	5.123	0.0040	0.0472	0.0476	534.6	4.921	0.0006	3.93	17 1/2
0.0026	0.0430	0.0437	623.9	6.447	0.0039	0.0446	0.0450	598.6	6.186	0.0006	3.50	18
0.0025	0.0406	0.0413	700.7	8.143	0.0038	0.0422	0.0426	670.6	7.794	0.0006	3.11	18 1/2
0.0025	0.0385	0.0391	782.9	10.19	0.0037	0.0400	0.0404	748.5	9.746	0.0006	2.77	19
0.0024	0.0365	0.0371	872.8	12.75	0.0036	0.0379	0.0383	836.1	12.21	0.0006	2.48	19 1/2
0.0024	0.0346	0.0351	976.5	16.00	0.0035	0.0359	0.0363	934.6	15.32	0.0005	2.21	20
0.0023	0.0327	0.0332	1095	20.14	0.0034	0.0340	0.0344	1045	19.23	0.0005	1.97	20 1/2
0.0022	0.0309	0.0315	1225	25.32	0.0034	0.0323	0.0326	1166	24.10	0.0005	1.75	21
0.0022	0.0293	0.0298	1371	31.79	0.0033	0.0306	0.0309	1304	30.24	0.0005	1.56	21 1/2
0.0021	0.0276	0.0281	1547	40.56	0.0032	0.0289	0.0292	1467	38.46	0.0005	1.37	22
0.0021	0.0262	0.0267	1724	50.66	0.0031	0.0274	0.0277	1637	48.09	0.0005	1.24	22 1/2
0.0020	0.0248	0.0253	1926	63.30	0.0030	0.0260	0.0263	1823	59.91	0.0005	1.10	23
0.0020	0.0235	0.0240	2156	79.74	0.0030	0.0246	0.0249	2038	75.40	0.0005	0.98	23 1/2
0.0019	0.0222	0.0227	2418	100.4	0.0029	0.0233	0.0236	2279	94.67	0.0005	0.87	24
0.0019	0.0211	0.0215	2682	124.7	0.0028	0.0221	0.0224	2540	118.1	0.0005	0.78	24 1/2
0.0018	0.0199	0.0203	3018	158.1	0.0027	0.0209	0.0212	2849	149.2	0.0005	0.69	25
0.0018	0.0189	0.0193	3363	197.6	0.0027	0.0199	0.0202	3164	185.9	0.0005	0.61	25 1/2
0.0017	0.0178	0.0182	3795	251.9	0.0026	0.0188	0.0191	3556	236.1	0.0005	0.54	26
0.0017	0.0169	0.0173	4232	315.7	0.0025	0.0179	0.0182	3965	295.7	0.0005	0.49	26 1/2
0.0016	0.0161	0.0165	4705	391.6	0.0025	0.0170	0.0173	4392	365.5	0.0005	0.44	27
0.0016	0.0152	0.0156	5261	491.7	0.0024	0.0161	0.0164	4910	458.9	0.0005	0.39	27 1/2
0.0016	0.0144	0.0147	5923	626.1	0.0023	0.0152	0.0155	5526	584.1	0.0005	0.34	28
0.0015	0.0136	0.0140	6613	783.7	0.0023	0.0145	0.0147	6145	728.2	0.0005	0.31	28 1/2
0.0015	0.0130	0.0133	7310	960.7	0.0022	0.0138	0.0141	6767	889.3	0.0004	0.28	29
0.0014	0.0122	0.0126	8265	1234	0.0022	0.0131	0.0133	7613	1,137	0.0004	0.24	29 1/2
0.0013	0.0115	0.0119	9296	1560	0.0020	0.0123	0.0126	8564	1,437	0.0004	0.22	30

Resistance Correction Factors for Annealed Copper and Aluminum Wire

Temperature		Resistance Correction Factor		Temperature		Resistance Correction Factor		Temperature		Resistance Correction Factor	
(°C)	(°F)	Cu	Al	(°C)	(°F)	Cu	Al	(°C)	(°F)	Cu	Al
15.0	59.0	0.9804	0.9796	23.5	74.3	1.0138	1.0144	29.5	85.1	1.0373	1.0390
16.0	60.8	0.9843	0.9837	24.0	75.2	1.0157	1.0164	30.0	86.0	1.0393	1.0410
17.0	62.6	0.9882	0.9878	24.5	76.1	1.0177	1.0185	31.0	87.8	1.0432	1.0449
18.0	64.4	0.9921	0.9918	25.0	77.0	1.0197	1.0205	32.0	89.6	1.0472	1.0490
19.0	66.2	0.9961	0.9959	25.5	77.9	1.0216	1.0226	33.0	91.4	1.0511	1.0530
20.0	68.0	1.0000	1.0000	26.0	78.8	1.0236	1.0246	34.0	93.2	1.0550	1.0571
20.5	68.9	1.0020	1.0021	26.5	79.7	1.0255	1.0267	35.0	95.0	1.0590	1.0612
21.0	69.8	1.0039	1.0041	27.0	80.6	1.0275	1.0287	36.0	96.8	1.0629	1.0653
21.5	70.7	1.0059	1.0062	27.5	81.5	1.0295	1.0308	37.0	98.6	1.0668	1.0694
22.0	71.6	1.0079	1.0082	28.0	82.4	1.0314	1.0328	38.0	100.4	1.0707	1.0734
22.5	72.5	1.0098	1.0103	28.5	83.3	1.0334	1.0349	39.0	102.2	1.0747	1.0775
23.0	73.4	1.0118	1.0123	29.0	84.2	1.0354	1.0369	40.0	104.0	1.0786	1.0816

Resistance Conversions - To convert resistance to 20°C (68°F), divide resistance by the correction factor for the corresponding temperature and metal indicated in the above table. To find ohms/foot, divide Volume Resistivity by area in circular mills.

Dielectric Strength for Common NEMA Insulation Classes

AWG Size	Elongation Minimum %	Dielectric Strength - Minimum Breakdown Volts							
		MW 15-C (105° C)		MW 28-C (130° C)		MW 80-C (155° C)		MW 35-C (200° C)	
		Single	Heavy	Single	Heavy	Single	Heavy	Single	Heavy
10	35		6200		5575				6200
11	35		6000		5400				6000
12	34		5800		5225				5800
13	34		5600		5050				5600
14	33	3525	6325	3175	5700	3175	5700	3525	6325
15	33	3425	6175	3075	5550	3075	5550	3425	6175
16	33	3325	6000	3000	5400	3000	5400	3325	6000
17	32	3250	5850	2925	5275	2925	5275	3250	5850
18	32	3175	5700	2850	5125	2850	5125	3175	5700
19	31	3075	5550	2775	5000	2775	5000	3075	5550
20	30	3000	5400	2700	4850	2700	4850	3000	5400
21	30	2925	5250	2625	4725	2625	4725	2925	5250
22	29	2850	5125	2575	4625	2575	4625	2850	5125
23	29	2775	5000	2500	4500	2500	4500	2775	5000
24	28	2700	4850	2425	4375	2425	4375	2700	4850
25	28	2625	4725	2375	4250	2375	4250	2625	4725
26	27	2550	4600	2300	4150	2300	4150	2550	4600
27	27	2500	4500	2250	4050	2250	4050	2500	4500
28	26	2425	4375	2175	3950	2175	3950	2425	4375
29	26	2375	4250	2150	3825	2150	3825	2375	4250
30	25	2300	4150	2075	3725	2075	3725	2300	4150
31	24	2075	3825	1875	3450	1875	3450	2075	3825
32	24	1850	3525	1675	3175	1675	3175	1850	3525
33	23	1675	3250	1500	2925	1500	2925	1675	3250
34	22	1500	2975	1350	2675	1350	2675	1500	2975
35	21	1325	2750	1200	2475	1200	2475	1325	2750
36	20	1200	2525	1075	2275	1075	2275	1200	2525
37	20	1075	2325	975	2100	975	2100	1075	2325
38	19	950	2150	850	1925	850	1925	950	2150
39	18	850	1975	775	1775	775	1775	850	1975

Conversion - AWG to mm								
AWG Size	Nom In	Exact mm	AWG Size	Nom In	Exact mm	AWG Size	Nom In	Exact mm
12	0.0808	2.05	21 1/2	0.0269	0.68	31	0.0089	0.23
12 1/2	0.0764	1.94	22	0.0253	0.64	32	0.0080	0.20
13	0.0720	1.83	22 1/2	0.0240	0.61	33	0.0071	0.18
13 1/2	0.0681	1.73	23	0.0226	0.57	34	0.0063	0.16
14	0.0641	1.63	23 1/2	0.0214	0.54	35	0.0056	0.14
14 1/2	0.0606	1.54	24	0.0201	0.51	36	0.0050	0.13
15	0.0571	1.45	24 1/2	0.0190	0.48	37	0.0045	0.11
15 1/2	0.0540	1.37	25	0.0179	0.45	38	0.0040	0.10
16	0.0508	1.29	25 1/2	0.0169	0.43	39	0.0035	0.09
16 1/2	0.0481	1.22	26	0.0159	0.40	40	0.0031	0.08
17	0.0453	1.15	26 1/2	0.0150	0.38	41	0.0028	0.07
17 1/2	0.0428	1.09	27	0.0142	0.36	42	0.0025	0.06
18	0.0403	1.02	27 1/2	0.0134	0.34	43	0.0022	0.06
18 1/2	0.0381	0.97	28	0.0126	0.32	44	0.0020	0.05
19	0.0359	0.91	28 1/2	0.0120	0.30	45	0.0018	0.05
19 1/2	0.0340	0.86	29	0.0113	0.29	46	0.0016	0.04
20	0.0320	0.81	29 1/2	0.0107	0.27	47	0.0014	0.04
20 1/2	0.0303	0.77	30	0.0100	0.25			
21	0.0285	0.72	30 1/2	0.0095	0.24			

Conversion - mm to AWG								
mm Size	NOM In	Exact AWG	mm Size	Nom In	Exact AWG	mm Size	Nom In	Exact AWG
2.00	0.0787	12.22	0.55	0.0217	23.36	0.22	0.0087	31.26
1.90	0.0748	12.67	0.50	0.0197	24.18	0.21	0.0083	31.66
1.80	0.0709	13.13	0.48	0.0189	24.53	0.20	0.0079	32.08
1.70	0.0669	13.63	0.46	0.0181	24.90	0.19	0.0075	32.53
1.60	0.0630	14.15	0.44	0.0173	25.28	0.18	0.0071	32.99
1.50	0.0591	14.70	0.42	0.0165	25.68	0.17	0.0067	33.48
1.40	0.0051	15.30	0.40	0.0157	26.10	0.16	0.0063	34.01
1.30	0.0512	15.94	0.38	0.0150	26.55	0.15	0.0059	34.56
1.20	0.0472	16.63	0.36	0.0142	27.01	0.14	0.0055	35.16
1.10	0.0433	17.78	0.34	0.0134	37.51	0.13	0.0051	35.80
1.00	0.0394	18.20	0.32	0.0126	28.03	0.12	0.0047	36.49
0.95	0.0374	18.64	0.30	0.0118	28.59	0.11	0.0043	37.24
0.90	0.0354	19.11	0.29	0.0114	28.88	0.10	0.0039	38.06
0.85	0.0335	19.60	0.28	0.0110	29.18	0.09	0.0035	38.97
0.80	0.0315	20.13	0.27	0.0106	29.49	0.08	0.0031	39.99
0.75	0.0295	20.68	0.26	0.0102	29.82	0.07	0.0028	41.14
0.70	0.0276	21.28	0.25	0.0098	30.16	0.06	0.0024	42.47
0.65	0.0256	21.92	0.24	0.0094	30.51	0.05	0.0020	44.04
0.60	0.0236	22.61	0.23	0.0091	30.88	0.04	0.0016	45.96

Temperature Conversion Table

The center column of numbers refers to the temperature (in °C or °F) which is to be converted to the other scale.

Example 1: *70°F to be converted to °C.* Find 70 in the center column and read 21.1°C to the left.

Example 2: *70°C to be converted to °F.* Find 70 in the center column and read 158°F to the right.

Temperature Conversion											
°C		°F	°C		°F	°C		°F	°C		°F
-12.2	10	50	60.0	140	284	132.2	270	518	204.4	400	752
-6.67	20	68	65.6	150	302	137.8	280	536	210.0	410	770
-1.11	30	86	71.7	160	320	143.3	290	554	215.6	420	788
4.44	40	104	76.7	170	338	148.9	300	572	221.1	430	806
10.0	50	122	82.2	180	356	154.4	310	590	226.7	440	824
15.6	60	140	87.8	190	374	160.0	320	608	232.2	450	842
21.1	70	158	93.3	200	392	165.6	330	626	237.8	460	860
26.7	80	176	98.9	210	410	171.1	340	644	243.3	470	878
32.2	90	194	104.4	220	428	176.7	350	662	248.9	480	896
37.8	100	212	110.0	230	446	182.2	360	680	254.4	490	914
43.3	110	230	115.6	240	464	187.8	370	698	260.0	500	932
48.9	120	248	121.1	250	482	193.4	380	716	268.6	510	950
54.5	130	266	126.7	260	500	198.9	390	734	271.1	520	968

Copper and Aluminum Properties

One Mil = .001 inches
One Circular Mil = area of a circle one mil in diameter
One Square Mil = area of a square one mil on a side to convert:
Square Mils to Circular Mils multiply by 1.2732
Circular Mils to Square Mils multiply by 0.7854

Round Wire
Circular Mil = (D/.001)2
Square Mil = .7854 X D2
where D = Diameter in inches

Square & Rectangular Wire
Square Mil = ((W/.001 X (T/.001)) – R
where W = Width in inches
T = Thickness in inches
R = Radius factor from table

Radius in Inches	Radius Factor in Mils
0.010	86
0.012	124
0.016	210
0.020	343
0.025	537
0.031	838
0.047	1886
0.063	3353
0.094	7544

Corner radii for specified thicknesses of wire may be found in the table on page 24.

Copper	
Physical Properties	**Electrical Properties**
Weight per 1000 feet of Square & Rectangular Wire = (Square Mil area) X (0.003854)- To calculate Square Mil area	Volume Resistivity of annealed copper wire at 20°C = 10.371 ohms-circular mil/ft or 0.15328 ohm-gram/meter^2
Weight per 1000 feet of Round Wire - see tables pages 26-29	Temperature Coefficient of Resistance @ 20°C = 0.00393
Density of Copper = 8.89 grams per cubic centimeter or 0.32117 pounds per cubic inch	Volume Conductivity @ 20°C (IACS) = 100.0%
Coefficient of linear expansion per degrees C = 0.000017	Ohms per 1000 Feet @ 20°C = 10371/circular mil area based on 100% conductivty. 10268.68 at 101.6% conductivity
Aluminum	
Physical Properties	**Electrical Properties**
Weight per 1000 feet of Square & Rectangular Wire = (Square Mil area) X (0.001172)- To calculate Square Mil area	Volume Resistivity of 1350 alloy aluminum wire at 20°C = 16.782 ohms-circular mil/ft or 0.07541 ohm-gram/meter^2
Weight per 1000 feet of Round Wire - see tables pages 30-31	Temperature Coefficient of Resistance @ 20°C = 0.00410
Density of Aluminum = 2.703 grams per cubic centimeter or 0.09765 pounds per cubic inch	Volume Conductivity @ 20°C (IACS) = 61.8%
Coefficient of linear expansion per degrees C = 0.000023	Ohms per 1000 Feet @ 20°C = 16782/circular mil area based on 61.8% conductivty. 17114 at 60.6% conductivity

Rea Copper magnet wire is manufactured from electrolytic tough pitch copper that meets ASTMB49, B115 and Rea's physical and electrical specifications.

Rea Aluminum magnet wire is derived from selected rods of high purity, electrical grade 1350 aluminum. The basic properties of this aluminum are covered by specification ASTMB230.

Material Handling

Do Not Touch Wire

Pick up small spools by their ends or pickup holes - do not touch the wire. Skin acids, dirt, oil, etc. are detrimental to magnet wire insulations.

Don’t allow the flange of one spool/reel to bump the wire on an adjacent spool/reel.

Do Not Drop Spools or Reels

Avoid lifting the reel on its flange or rolling it off pallets directly to a hard surface as this will cause flange breakage.

To Avoid Injury, Use a Hoist to Pick up Reels

Use the pickup holes - don’t lift by the flanges. Picking up reels by the flanges may cause the flange to deflect slightly and may permit finer sizes of wire to shift causing “pinch-offs”. When using a lifting device, care should be taken to lift and lower the package as straight as possible with minimum swinging and shock.

When loading or unloading reels from a payoff shaft, ensure that the angle of the bore is the same as the shaft to prevent cracking around the bore opening.

Returnable Packages Handling

Packing

Returnable packages should be handled with care at all times to prevent damage. Avoid tossing and dropping.

Avoid over stacking unused packages to minimize potential damage and injury to your employees.

Empty returnable packages that are not stacked and stored directly onto a staged truck should be packed in suitable containers or palletized to prevent damage in shipment.

For each type of package, there is a recommended method of palletizing. For detailed instructions, please contact your Rea Customer Service Representative.

Storage

Returnable packaging should be stored indoors in a clean environment. When outdoor storage is necessary, packages must be covered with black plastic to prevent exposure to sunlight and the elements. Sunlight will weaken plastic reels.

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