

THE ROCKBESTOS COMPANY
INTERNAL MEMORANDUM

TO: Field Sales

DATE: May 30, 1986

FROM: L. P. Greiner

SUBJECT: REVIEW OF FEDERAL AND MILITARY SPECS.

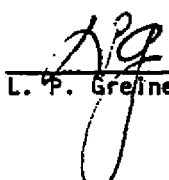
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An updated list of federal and military specifications for electrical wire is enclosed. It is arranged alphabetically: JC, MIL-C, and MIL-W; and numerically within each section. Descriptions and comments reflect the most current information. I anticipate that our product development efforts will require revisions to this listing in the near future.

Please insert these pages at the end of the High Temperature section of your price book or the Aerospace section of your catalog.

Price inquiries from "government contractor/distributors/brokers" for mil-spec wires should be forwarded to New Haven Quotations for uniform pricing, except for small quantities of stock items. Note that Firezone 101 printed per the mil-spec costs more than unprinted wire, so use the Schedule C price sheet rather than the regular price sheet.

As always, if you have questions, please call.


L. P. Greiner

LPG/dlf

enclosure



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SC-ELEC-08960

May 29, 1986
Supersedes 8/16/74

REVIEW OF MILITARY AND FEDERAL SPECIFICATIONS

FED. SPEC.

DESCRIPTION

JC-30-A

Used to provide numbering system to procure commercial types of wire for government agencies.

Spec. No.	UL Type	Maximum Working Voltage	Conductor Material	Type of Conductors	No. and Size of Conductors	Type of Insulation	Outer Covering	Ground Wire	Color Code of Single Conductor
JC-30A	XHHW	06	C	F	4/14	XP	NJ	-	-

EXAMPLE 4/C 14 FIREWALL III

VOLTAGE: 03 = 300 Volt, 06 = 500 Volt, 10 = 1000 Volt, etc.

CONDUCTOR: A = Aluminum, C = Copper

TYPE: E = Solid, F = Class B, G = Class C, H = Class G, J = Class H, K = Class K.

NO. & SIZE: Number of conductors first, then gauge size.

TYPE OF INSULATION:

R - Rubber
SR - Synthetic Rubber
NE - Neoprene
T - Thermoplastic
XP - Cross-Linked Polyethylene

CP - Chlorosulphonated Polyethylene
A - Asbestos
AV - Asbestos-Varnished-Cloth Insulated
V - Varnished Cloth

TYPE OF OUTER COVERING:

RJ - Rubber Jacket
SJ - Synthetic Rubber Jacket
NJ - Neoprene Jacket
TJ - Thermoplastic Jacket
PJ - Polyamide Jacket
XP - XLPE
CB - Cotton Braid

GB - Glass Braid
AB - Asbestos Covering
FC - Fibrous Covering
LS - Lead Sheath
AL - Aluminum Sheath
AR - Armored
UJ - Unjacket

GROUND WIRE: If applicable, "G"

SINGLE COLOR: If single conductor, use chart

Number Designator	Color	Number Designator	Color
0	Black	5	Green
1	Brown	6	Blue
2	Red	7	Violet (Purple)
3	Orange	8	Gray (Slate)
4	Yellow	9	White

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<u>MIL SPEC.</u>	<u>DESCRIPTION</u>	
MIL-C-17	Generally Polyethylene and Telfon Coaxial cables. Some nuclear coax cables are similar, but none meet Spec.	No Quote
MIL-C-915E	Water-tight Shipboard cables	No Quote
MIL-C-2194	Cancelled. Superseded by MIL-C-915E	
MIL-C-7078C	Blanket Spec. covering added conductors and components over aerospace wires made to other Specs. Basic wires referenced are not of interest.	No Quote
MIL-C-12000	Packaging Standards	
MIL-C-13777	Polyethylene or natural rubber cord.	No Quote
MIL-C-24145	Cancelled. See MIL-C-915E	
MIL-C-27500	Blanket Spec. covering added conductors and components over aerospace wires made to other Specs. Specific color codes for multi-conductor cables, tapes, shields, jackets. This is a popular standard and gives a part numbering system, explained below.	

EXAMPLE

<u>M27500</u>	<u>22</u>	<u>JA</u>	<u>3</u>	<u>CT</u>	<u>6</u>
CABLE SPECIFICATION NUMBER	WIRE SIZE(S)	BASIC WIRE SPECIFICATION TYPE & CLASS	NO. OF WIRES PER CABLE	SHIELD JACKET	JACKET STYLE

EXAMPLE: M27500-22AJC6

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MIL-C-27500E (USAF), continued

BASIC WIRE SPECIFICATIONS

Symbol	Basic Wire Specification	Symbol	Basic Wire Specification
A	*MIL-W-5086/1	SE	MIL-W-22759/31
B	*MIL-W-5086/3	JA*	MIL-W-25038/77*
C	*MIL-W-5086/4	M	*MIL-W-81044/1
P	*MIL-W-5086/4	MA	MIL-W-81044/2
AA	*MIL-W-5068/5	MB	*MIL-W-81044/3
AB	*MIL-W-5086/6	MC	MIL-W-81044/4
AD	*MIL-W-5086/7	MD	*MIL-W-81044/5
IF	MIL-W-8777, MS25471	ME	*MIL-W-81044/6
F	MIL-W-8777, MS27110	MF	MIL-W-81044/7
EA	MIL-W-22759/1	MG	*MIL-W-81044/8
E	MIL-W-22759/2	MH	MIL-W-81044/9
RA	MIL-W-22759/3	HJ	MIL-W-81044/10
RA*	MIL-W-22759/4	HK	*MIL-W-81044/11
VA	*MIL-W-22759/5	NL	MIL-W-81044/12
WA	*MIL-W-22759/6	NM	MIL-W-81044/13
SA	MIL-W-22759/7	NH	MIL-W-81044/14
TA	MIL-W-22759/8	MP	MIL-W-81044/15
LE	MIL-W-22759/9	MR	MIL-W-81044/30
LH	MIL-W-22759/10	MT	MIL-W-81044/31
RC	MIL-W-22759/11	Y	*MIL-W-81381/1
RF	MIL-W-22759/12	YA	*MIL-W-81381/2
CA	MIL-W-22759/13	YB	*MIL-W-81381/3
CB	MIL-W-22759/14	YC	*MIL-W-81381/4
CC	MIL-W-22759/15	MR	MIL-W-81381/7
TE	MIL-W-22759/16	MS	MIL-W-81381/8
TF	MIL-W-22759/17	MT	MIL-W-81381/9
TG	MIL-W-22759/18	MV	MIL-W-81381/10
TH	MIL-W-22759/19	MW	MIL-W-81381/11
TK	MIL-W-22759/20	MY	MIL-W-81381/12
TL	MIL-W-22759/21	NA	MIL-W-81381/13
TM	MIL-W-22759/22	NB	MIL-W-81381/14
TN	MIL-W-22759/23	NE	MIL-W-81381/17
TT	MIL-W-22759/24	NF	MIL-W-81381/18
TP	MIL-W-22759/25	NG	MIL-W-81381/19
TR	MIL-W-22759/26	NH	MIL-W-81381/20
TS	MIL-W-22759/27	NK	MIL-W-81381/21
SA	MIL-W-22759/28	NL	MIL-W-81381/22
SB	MIL-W-22759/29		
SC	MIL-W-22759/30		

*Inactive for new design

Only type letters H, F, RB, and JA are of interest at this time.

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MIL-C-27500E (USAF), continued

Shield style and material. The shield style and material of the overall shield(s) shall be designated by a single letter as follows:

<u>Symbol Single Shield Style</u>	<u>Symbol Double Shield Style</u>	<u>Shield Material</u>	<u>Temperature Limit For Shield Material (Information Only)</u>
U	-	No Shield	-----
T	V	Tin-coated Copper, Round	150°C (302°F)
S	W	Silver-coated Copper, Round	200°C (392°F)
N	Y	Nickel-coated Copper, Round	260°C (500°F)
F	Z	Stainless Steel, Round	400°C (752°F)
C	R	Nickel-clad Copper, Round	400°C (752°F)
M	K	Silver-coated High Strength Copper Alloy, Round	200°C (392°F)
P	L	Nickel-coated High Copper Alloy, Round	260°C (500°F)
G	A	Silver-coated Copper, Flat	260°C (500°F)
H	B	Silver-coated High Strength Copper Alloy, Flat	200°C (392°F)
J	D	Tin-coated Copper, Flat	150°C (302°F)
E	X	Nickel-coated High Strength Copper Alloy, Flat	260°C (500°F)

Jacket Material. The single jacket style shall consist of an outer jacket only. The double jacket style shall be used in conjunction with a double shield style only and shall consist of a jacket between the two shields and an outer jacket. The inner and outer jackets shall be of the same material. The jacket style and material shall be designated by two digits as follows:

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MIL-C-27500E (USAF), continued

<u>Single Jacket Symbol</u>	<u>Double Jacket Symbol</u>	<u>Material</u>	<u>Temperature limits for Jacket Material (information only)</u>
00	00	No Jacket	-----
01	51	Extruded white Polyvinyl Chloride	90°C (194°F)
02	52	Extruded clear nylon in accordance with type III, Grade E, MIL-M-20693	105°C (221°F)
03	53	White nylon braid impregnated with clear nylon finisher over a polyester tape	105°C (221°F)
04	54	Polyester braid impregnated with high temperature finishers over polyester tape	150°C (302°F)
05	55	Extruded clear fluorinated Ethylene Propylene	200°C (392°F)
06	56	Extruded or taped and fused white Polytetrafluoroethylene	260°C (500°F)
07	57	White Polytetrafluoroethylene coated glass braid impregnated with Polytetrafluoroethylene finisher over a Polytetrafluoroethylene tape	260°C (500°F)
08	58	Cross-linked white extruded Polyvinylidene Fluoride	150°C (302°F)
09	59	Extruded white fluorinated ethylene propylene	200°C (392°F)
10	60	Extruded clear Polyvinylidene fluoride	125°C (275°F)
11	61	Tape of natural Polyimide combined with clear fluorinated ethylene propylene (FEP) wrapped and heat sealed with FEP outer surface	200°C (392°F)

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MIL-C-27500E (USAF), continued

<u>SINGLE JACKET SYMBOL</u>	<u>DOUBLE JACKET SYMBOL</u>	<u>MATERIAL</u>	<u>TEMPERATURE LIMITS FOR JACKET MATERIAL (INFORMATION ONLY)</u>
12	62	Tape of natural Polyimide combined with Fluorinated Ethylene Propylene (FEP) wrapped and heat sealed with Polyimide outer surface	200°C (392°F)
14	64	Extruded white Ethylene-tetrafluoroethylene Copolymer (ETFE)	150°C (302°F)
15	65	Extruded clear Ethylene-tetrafluoroethylene (ETFE) Copolymer	150°C (302°F)
15	66	Braid of aromatic Polyimide with high temperature finisher over polytetrafluoroethylene tape	230°C (332°F)
17	67	White extruded ethylene chlorotrifluoroethylene (ECTFE)	150°C (302°F)
18	68	Clear extruded ethylene chlorotrifluoroethylene (ECTFE)	150°C (302°F)
20	70	Extruded white perfluoroalkoxy (PFA)	260°C (500°F)
21	71	Extruded clear perfluoroalkoxy (PFA)	260°C (500°F)
22	72	Tape of natural polyimide combined with clear fluorinated ethylene propylene (FEP) wrapped and heat sealed with dip coated modified aromatic polyimide outer surface	200°C (392°F)

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MIL-W-5086 Plastic insulated wire NO QUOTE

MIL-W-71398 Heatzone I is made to 8 revision. Class I is silver coated copper, Class II is nickel-plated copper. Spec. is obsolete but we still conform. There is no QPL. RSS-5-191-1 or -2.

MIL-W-8777C MS25471 covers Interzone I, which has dacron outer braid. (RSS-5-106) MS27110 covers Interzone II, which has FEP jacket. (RSS-5-105) Both wires have silver-coated copper conductor, silicone rubber insulation and glass braid.

QUALIFICATION TEST REFERENCES

MS25471 (22-6 AWG) ASNPVE-TM-134 (26 Dec. 61)
MS25471 (4-2/0 AWG) ASN-TM-62-17 (30 Mar. 62)
MS27110 (22-12 AWG) ASNPVE-TM-62-18 (30 Mar. 62)
MS27110 (8-4 AWG) ASNPVE-TM-62-60 (20 Sept. 62)

MIL-W-16878E Hook-up wires.

INSULATION VOLTAGE:	16878D TYPES			300V	16878E TYPES		1000V	COMMENT
	300V	600V	1000V		600V			
PVC	B	C	D	1,17	2,18	3,19		NO QUOTE
Extruded TFE	ET	E	EE	6,20,23-4	4,21,25-6	5,22,27-8		NO QUOTE
Silicone Rubber		F	FF,FFW		7-29	8,30-2		*
Polyethylene		J		10,23				NO QUOTE
Extruded FEP	KT	K	KK	13	11	12		*

*We are usually not competitive. Customer must specify tin, nickel, or silver coated copper, and if overlying glass braid is required.

Silicone product is RSS-5-403. Extruded FEP is RSS-5-405.

MIL-W-22759D/1 Similar to Heatzone I, Class I.
2 Similar to Heatzone I, Class II.
3 Nickel-plated copper, Teflon tape Insul. and jacket. RSS-5-149 **
4 Heatzone III * RSS-5-126
5-15 Extruded TFE Types
16-19 Tefzel, ETFE Types

NO QUOTE
NO QUOTE

*We are on QPL for M22759/4 (Heatzone III, as stocked).
Qualification Test Reference NAC-B16.77/3-30-85 for sizes
22 AWG - 2/0 AWG. See M25038 for part numbering scheme, i.e.
M22759/4-8-9 is white and size #8 AWG.

** We are on QPL for M22759/3 for sizes 22-2 AWG. Test reference number
is NAC C16.77/06-16-86.

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MIL-W-25038E Firezone 101 (unprinted HTI-0 XXT or formerly in stock, RSS-5-101) and is designated as Firezone 101M.

NOTE: Commercial Firezone (MIL-0XXI) is not made to MIL-Spec. It meets performance requirements but it cannot be certified for airworthiness. It is made to RSS-5-148.

- C Has green ink printed legend, bought by Grumman.
- D Can be printed in any contrasting color. Reduced testing requirements. Has part numbering system. Part numbers are M25038/1-(gauge size)-(basic color from chart below)-(tracer color if any from chart below.)

E Added print durability requirement: Ink must be green.

COLOR CODE CHART							
Number		Designator	Color	Number		Designator	Color
0			Black	5			Green
1			Brown	6			Blue
2			Red	7			Violet (Purple)
3			Orange	8			Gray (Slate)
4			Yellow	9			White

NOTE: This chart is not intended to signify a color sequence, but only a number color identification.

Examples: M25038/1-20-9 is plain white and #20 gauge.
M25038/1-01-92 is white with red tracer and 1/0.
M25038/1-8-2 is red and #8 gauge.

QPL: Qualification Test Reference NAC-817.02/09-30/84.
Firezone 101: 22-4/0 AWG. H-Zone (M527125) 22-12 AWG.

H-Zone is manufactured to RSS-5-123.

Firezone 101G (non-asbestos) is now listed for a limited range of sizes, #12-#16 AWG. Qualification Test Reference is NAC-F17.02/10-02-86, and our reference number is RSS-5-152. We are pursuing approval for additional sizes.

M25038/3

M25038/3 Asbestos Insulation. Rockbestos H-Zone 350 Sizes 16-20 AWG. Made to RSS-5-143 Qualification Test Reference NAC-C17.02/9-22-86

M25038/3 Non-asbestos Insulation. Rockbestos H-Zone 350G Sizes 16-20 AWG. Made to RSS-5-153. Qualification Test Reference NAC-D17.02/9-03-86

MIL-W-81044 Cross-Linked Polyalkene

NO QUOTE

MIL-W-81381

Interzone X, X/1, X/2, Etc. We have great manufacturing problems in supplying acceptable lengths.

NO QUOTE

DEFINITIONS:

QPL = Qualified Producers List
RSS = Rockbestos Sales Specification

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