

**RUBADUE WIRE CO INC**

5610 Boeing Dr, Loveland CO 80538

<u>System Component</u>	<u>System Designation</u>	<u>System Class</u>
D-(10 to 40)-X-XX-F-XX-M (M = or > 2.0), D-(10 to 40)-X-XX-T-XX-N (N = or > 3.0), D-(16 to 40)-X-XX-T-XX-L (L = or > 1.5), D-(18 to 40)-X-XX-T-XX-L-SB-X (L = or > 1.5), D-(30 to 40)-X-XX-T-XX-P (P = or > 1.25), D-(30 to 40)-X-XX-T-XX-U (U = or > 1.0), D-(30 to 40)-X-XX-T-XX-U-SB-X (U = or > 1.0), D-(4-6)-X-A-XX-F-I, D-(7-10)-X-A-XX-F-H, S-(10 to 26)-X-XX-T-X-V (V = or > 3.4), S-(10 to 40)-X-XX-F-X-N (N = or > 3.0), S-(18 to 40)-X-XX-F-X-M (M = or > 2.0), S-(22 to 40)-X-XX-T-X-L (L = or > 1.5), S-(22 to 40)-X-XX-T-X-L-SB-X (L = or > 1.5), S-(4-6)-X-A-XX-F-G, S-(7-10)-XX-A-XX-F-C, T-(10 to 40)-X-XX-F-XXX-M (M = or > 2.0), T-(10 to 40)-X-XX-T-XXX-M (M = or > 2.0), T-(18 to 40)-X-XX-T-XXX-L (L = or > 1.5) (b), T-(18 to 40)-X-XX-T-XXX-L-SB-X (L = or > 1.5), T-(20 to 40)-X-XX-T-XXX-U (U = or > 1.0), T-(20 to 40)-X-XX-T-XXX-U-SB-X (U = or > 1.0), T-(4-10)-X-A-XX-F-J	RXT-1	130(B)

Report Date: 1998-06-18

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An Authorization Letter is Required for Adoption of this System

**Construction Details (Table I)**

The use of this insulation system is limited to the combination of materials specified below. Where more than one item is designated under insulation function, they may be used together indicated, or they may be used as alternates to one another. Functions designated "optional" are not necessarily required for every design. Insulation thicknesses and/or layers below minimum.

**Filament Wire**

Additional Ground & Interwinding insulation **is not** required to separate this winding from other windings or between this winding and grounded/dead metal

Recognized Component Single and Multi-Layer Insulated Winding Wire (OBJT2) listed below

Recognized Component Appliance Wiring Material (AVLV2) listed below

Unless otherwise noted, winding wire types listed below may be used in combination within a single product

RUBADUE WIRE CO INC [E206198] - Recognized Component

D-(10 to 40)-X-XX-F-XX-M (M = or > 2.0)	4.5 (0.11)	minimum overall wall thickness
D-(10 to 40)-X-XX-T-XX-N (N = or > 3.0)	4.5 (0.11)	minimum overall wall thickness
D-(16 to 40)-X-XX-T-XX-L (L = or > 1.5)	4.5 (0.11)	minimum overall wall thickness
D-(18 to 40)-X-XX-T-XX-L-SB-X (L = or > 1.5)	4.5 (0.11)	minimum overall wall thickness
D-(30 to 40)-X-XX-T-XX-P (P = or > 1.25)	4.5 (0.11)	minimum overall wall thickness
D-(30 to 40)-X-XX-T-XX-U (U = or > 1.0)	4.5 (0.11)	minimum overall wall thickness
D-(30 to 40)-X-XX-T-XX-U-SB-X (U = or > 1.0)	4.5 (0.11)	minimum overall wall thickness
D-(4-6)-X-A-XX-F-I	4.5 (0.11)	minimum overall wall thickness
D-(7-10)-X-A-XX-F-H	4.5 (0.11)	minimum overall wall thickness
S-(10 to 26)-X-XX-T-X-V (V = or > 3.4)	4.5 (0.11)	minimum overall wall thickness
S-(10 to 40)-X-XX-F-X-N (N = or > 3.0)	4.5 (0.11)	minimum overall wall thickness
S-(18 to 40)-X-XX-F-X-M (M = or > 2.0)	4.5 (0.11)	minimum overall wall thickness
S-(22 to 40)-X-XX-T-X-L (L = or > 1.5)	4.5 (0.11)	minimum overall wall thickness
S-(22 to 40)-X-XX-T-X-L-SB-X (L = or > 1.5)	4.5 (0.11)	minimum overall wall thickness
S-(4-6)-X-A-XX-F-G	4.5 (0.11)	minimum overall wall thickness
S-(7-10)-XX-A-XX-F-C	4.5 (0.11)	minimum overall wall thickness
T-(10 to 40)-X-XX-F-XXX-M (M = or > 2.0)	4.5 (0.11)	minimum overall wall thickness
T-(10 to 40)-X-XX-T-XXX-M (M = or > 2.0)	4.5 (0.11)	minimum overall wall thickness
T-(18 to 40)-X-XX-T-XXX-L (L = or > 1.5) (b)	4.5 (0.11)	minimum overall wall thickness
T-(18 to 40)-X-XX-T-XXX-L-SB-X (L = or > 1.5)	4.5 (0.11)	minimum overall wall thickness
T-(20 to 40)-X-XX-T-XXX-U (U = or > 1.0)	4.5 (0.11)	minimum overall wall thickness
T-(20 to 40)-X-XX-T-XXX-U-SB-X (U = or > 1.0)	4.5 (0.11)	minimum overall wall thickness
T-(4-10)-X-A-XX-F-J	4.5 (0.11)	minimum overall wall thickness

**Enameled Wire**

Recognized Component - Magnet wire (OBMW2), single build or greater, round or rectangular, copper or aluminum unless stated otherwise for the types listed below

Ground Insulation is required to separate this winding from grounded/dead metal

Interwinding Insulation **is** required to separate this winding from other enameled wire

Unless otherwise noted, Winding Wire types listed below may be used in combination within a single product

<u>ANSI Type</u>	<u>Temp(°C)</u>	<u>Basecoat(Topcoat)</u>
MW 76	or 180°C	Polyester-amide-imide (Polyamide)
MW 80	or 155°C	Polyurethane (Polyamide)

Bare Conductor - wapped with Nomex 410, 2 mils (0.051mm) min. 50% overlap.

**Ground and Interwinding Insulations**

any Recognized Component Plastic (QMFZ2), polyethylene terephthalate film (PET) 1 mils minimum

<u>Designation</u>	<u>mils(mm)</u>	<u>comments</u>
<u>CELANESE INTERNATIONAL CORP [E344082] - Recognized Component</u>		
ZENITE 6130(+)	15 (0.38)	
ZENITE 7130, 7130 ECO-B(S)	15 (0.38)	
<u>CELANESE INTERNATIONAL CORP [E41938] - Recognized Component</u>		
Rynite FR530(I)(+)(f1), FR530L(I)(+)(f1)	15 (0.38)	
<u>DuPont Specialty Products USA LLC [E39505] - Recognized Component</u>		
Kapton® 100H, 100HN, 100HN-S, 100H-ZT, 100HN-ZT, 100FPC-ZT, 100TAB-ZT, 100PST, 100HA, 100TN, 100V, 100VN, 100FPC, 100FPC-A, 100HPP-ST, 100PST-A	1 (0.03)	
<u>DuPont Specialty Products USA, LLC [E34739] - Recognized Component</u>		
Nomex® 410	5 (0.13)	
<u>P LEO &amp; CO LTD [E126174] - Recognized Component</u>		
1P756 (h)	1 (0.03)	
1P801	1 (0.03)	
1P802	1 (0.03)	

## Lead Wires

lead wires are optional for this system

Temp	Insulation
125°C	XLPE - crosslinked polyethylene
150°C	SR - silicone rubber(with or without braid)
150°C	EPDM - ethylene propylene diene monomer
150°C	Perfluoro-alkyl vinyl ether/Al/PET/EVA
150°C	FEP - fluorinated ethylene propylene
150°C	XLPE - crosslinked polyethylene
200°C	SR - silicone rubber(with or without braid)
200°C	FEP - fluorinated ethylene propylene
200°C	Perfluoro-alkyl vinyl ether/Al/PET/EVA

## Minor Sheet Materials

(layer, outer, wrap etc.) minor sheet is optional for this system

Designation	comments
<u>3M Innovative Paper Technologies</u> CeQuin 30F, 30F30, F30F CeQuin 500 CeQuin GeSat CeQuin IG, IGI, GIG CeQuinbord CEL SAT TufQuin 100, 110, 120	
<u>Dupont -Teijin Films</u> Mylar	
<u>E. I. Dupont de Nemours &amp; Co.</u> Nomex®	
<u>Various Manufacturers</u> Kraft Paper	
<u>Von Roll USA, Inc.</u> 5JF Memco 100 DMD Pyroglass Pyrolam 100X	

any sheet insulation or tape described in this table with no minimum thickness requirement may be used as a minor sheet material

## Tapes

tapes are optional for this system

Designation	comments
<u>3M (Minnesota Mining &amp; Mfg Co)</u> 11 3 90	thermosetting rubber adhesive, black acetate cloth thermosetting rubber adhesive, flatback paper glass cloth
<u>3M COMPANY [E17385] - Listed or Recognized Component</u> 1194 1245 1312 (a) 1318 clear (a) 1318-1 (a) 1318-2 (a) 1339 1350-1 (b) 1350-2 (c) 1350F-1 (b) 1350F-2 (c) 27 (a) 44 (a) 46 56 (a) 60 69 (a), 9 (a) 92 Super 20 (a)	
<u>Chomerics</u> 101 202 301	
<u>Compac</u> 812-8 836-7 837-5	
<u>Dielectric Polymers</u> NT 590	
<u>Electro Tape Specialties Inc</u> ETS-21FR ETS-23 ETS-29 ETS-418 ETS-451 ETS-92 ETS-94 ETS-95 ETS-97	
<u>ELECTRO TAPE SPECIALTIES INC [E52363] - Listed or Recognized Component</u> ETS-149 ETS-269	
<u>IDEAL TAPE CO INC [E82910] - Listed or Recognized Component</u>	

IT-700 (b)  
IT-7007 (b)  
IT-7017 (b)  
IT-7170 (c)  
IT-7177  
IT-720 (b)  
IT-725  
IT-7270  
IT-7300  
IT-750 Natural (b)  
IT-7807 (b)

INTERTAPE POLYMER GROUP [E20780] - Listed or Recognized Component

4238 (16)\*  
4309 (6228)\*  
4426-04-(39)\*  
4427-00 (415)\*  
4428 (23)\*  
4616-00 (51)\*  
4617 (58)\*  
51587-04\*  
51589-00  
51596\* (b)  
51597

Intertape Polymer Group (Tesa, Tuck, Spinnaker)

4194  
4353  
50501  
51582  
51587-17

polyester film

Nitto Denko Corp

156  
315  
380

rubber adhesive, polyester film

NITTO DENKO CORP [E34833] - Listed or Recognized Component

188UL  
3161F \*\*\* this product is no longer Recognized \*\*\*  
354E  
360UL  
903

Nitto Inc [E20392] - Listed or Recognized Component

P-213, P-213S, EE-7240  
P-221 (P-221L, P-221PL, 6379)  
P-222 (P-222L, P-222PL, 6761)  
P-224 AMB (formerly P-224)  
P-234  
P-245 (a) (P-245 BLK (a))  
P-248  
P-253  
P-256  
P-262  
P-277  
P-281 (c) (P-281 BK (c))  
P-286  
P-422  
P-430 NAT

Nitto Permacel

P-21  
P-241  
P-427

thermosetting rubber adhesive, glass cloth

thermosetting silicone adhesive, PTFE film

P Leo & Co (B C) Ltd

1P130

acrylic adhesive, polyester film

P LEO & CO LTD [E126174] - Listed or Recognized Component

1G006  
1G015  
1G027A  
1G155  
1G180  
1H850 Black (q)  
1H850 Natural (o)  
1H860 (f)  
1K063  
1K7170  
1K7177 \*\*\* this product is no longer Recognized \*\*\*  
1K7270  
1N012  
1P700 (b)  
1P707 (b)  
1P717 (b)  
1PK825  
1PN820 (o)

PPI ADHESIVE PRODUCTS LTD [E86214] - Listed or Recognized Component

65120  
70110

SAINT-GOBAIN PERFORMANCE PLASTICS CORP [E51201] - Listed or Recognized Component

G565  
K103A  
K250A (d)  
M54A  
M97 (b) \*\*\* this product is no longer Recognized \*\*\*

Saint-Gobain Performance Plastics Corp.

G551

thermosetting rubber adhesive, glass cloth

Symbio Inc

MY1  
MY9  
NM13

aramid (Nomex) paper

SYMBIO INC. [E50292] - Listed or Recognized Component

**GL06**  
**GL15**  
**GL27**  
**KA00**  
**KA180**  
**MY130 (b)**  
**NM130**

## **Core tubes and Bobbins**

(for mechanical support only) cores are optional for this system

Designation

comments

CELANESE INTERNATIONAL CORP. [E41938] - employing Recognized materials

**Rynite FR530(I)(+)(f1), FR530L(I)(+)(f1)**  
**Zytel 101(f2)(r9), 101F(f2)(r9), 101L(f2)(r9)**  
**Zytel 103FHS(+), 103HSL(+)**  
**Zytel 70G30HSL, 70G30HSLR**  
**Zytel 70G33L(+)**  
**Zytel FR50(+)(f1)**

CHANG CHUN PLASTICS CO LTD. [E59481] - employing Recognized materials

**LONGLITE T373J**  
**LONGLITE T375J(G5)(G6)**

E. I. DuPont de Nemours & Co.

MX6130

Paramount Tube

ParaQuin  
Rigid ParaQuin

RTP CO. [E84658] - employing Recognized materials

**RTP 205 FR**

SUMITOMO BAKELITE CO LTD. [E41429] - employing Recognized materials

**SUMIKON PM-8375**  
**SUMIKON PM-9630**  
**SUMIKON PM-9750**  
**SUMIKON PM-9820, PM-9825**  
**SUMIKON PM-9830**

TORAY INDUSTRIES INC. [E41797] - employing Recognized materials

Ryton R-4(\$\$(f1) \*\*\* materials are no longer Recognized \*\*\*

## **Spacer and Wedges**

spacer and wedges are optional for this system

Designation

comments

Solvay Specialty Polymers USA L L C. [E95746] - employing Recognized materials

**RYTON R-4 02 XT(f1)**

Various Manufacturers

Wood, Untreated

any material described in this table with no thickness requirement may be used as a spacer or a wedge

## **Tubing and Sleeving**

tubing and sleeving are optional for this system

Designation

comments

ATKINS & PEARCE INC. [E15253] - Recognized Component

**Silverflex T&D**

ATKINS & PEARCE INC. [E63446] - Recognized Component

**1151-FR**  
**1151-XL-200**  
**1151-XL-240**  
**1151-XL-FR1**  
**ACRYL**  
**Silicone Resin HD**  
**Silicone Rubber HD**

Atkins & Pearce Inc.

Ben Har Ex-Flex 1500  
NU-FLEX WHS-25  
Suflex Acryflex VPI-NF  
Suflex Acryflex  
Suflex Flexicone  
Suflex Silicone Rubber Resin

Atlantic Tubing

TFS

Delfingen US-New York Inc

Flexite PO-135 shrinkdown  
Flexite TFE  
NU-SLEEVE AG-155-B  
NU-SLEEVE SG-200

DELFINEN US-NEW YORK INC. [E93101] - Recognized Component

**NU Sleeve SG-200-A**  
**NU-Sleeve AG-155-A**  
**NU-Sleeve T117-FR**

GREAT HOLDING INDUSTRIAL CO LTD. [E156256] - Recognized Component

**TFT**

Hilec/Delfingen US-New York Inc

Hilec 310 Series

Hilec 410 Series  
Hilec 540 Series  
Hilec 710 Series

TEXLOC LTD [E103313] - Recognized Component

Light Wall (LW) \*\*\* this product is no longer Recognized \*\*\*  
Standard Wall (SW) \*\*\* this product is no longer Recognized \*\*\*  
Thin Wall (TW) \*\*\* this product is no longer Recognized \*\*\*

Varflex

Silflex  
Silicone Rubber ES 4400 H-A-1  
Varflo B-A-1

VARFLEX CORP [E53690] - Recognized Component

**Varglas 231, Varglas Viton 231**  
**Varglas Non-Fray HM**  
**Varglas Non-Fray HO**

VARFLEX CORP [E63450] - Recognized Component

**Varglas**  
**Varglas A-397**  
**Varglas Silicone Resin 500**

## Tie Cords

tie cords are optional for this system

Designation

comments

American Efird Inc.

LP 1008  
LP 1012  
LP 1126  
LP 1552  
LP 1556  
N884

Atkins & Pearce Inc.

13-220  
16-2HT  
17-200-NX  
29-210  
AP-3100-T  
MS 9023-T4

Breyden Products

5070, 5100, 5200, 5311, 5312, 5313, 5350, 150, 225, 350  
60, 75, 100, 200, 252, 330, 350, 390, 500, 504, 6100, 6200, 6500, 3MC, 5MC, 7MC

optional prefix of "G" or suffixes of "-1"  
optional prefix of "HT" or suffixes of "-1" or "-LS"

Varflex

48

silicone coated fiberglass

Western Filament

50DOF17W  
50NOF17W  
DHS-1CL

## Varnishes

varnishes are optional for this system

Designation

comments

ELANTAS North America, Inc [E75225] - Recognized Component

**468-2 (d), 468-2FC (d), 468-2-7-xxF (d), 468-2-7FC-xxF (d)**  
**C1525A, C1525F35, C1525G45**  
**V1380, V1380FC, V1380FC Black, 80381FC**  
**V1630, V1630FS, V1630FS50, V1630FS Black, 80361, 80361FS**

John C Dolph Co [E317427] - Recognized Component

**AC-43, EB-43-HG, EB-43-FB, AC-43-66, EG-43/698-D, EG-43/759-D, ER-43/368-D, EB-43/387-D**  
**BC-346A, BC-346-A, BC-346B, BC-346-E, BB-348, BB-346-HF, BC-346HF, BG-346A, BB-346-A, BB-346/A, BC-370**  
**CC-1105, CC-1105HTC, CC-1103, CC-1105OPT, CC-1105OPT/HTC, CC-1105LV, CB-1105HTC, PDR-1933, PDR-1711, CC-1155, CC-1156, CC-1106**  
**CC-1305, CC-1305-HTC, CC-1305/503D, CC-1305-HTC-FC, CB-1305-HTC**