elastimold®

CABLE ACCESSORIES

PG-CA-R2T-0807

POWER DELIVERY

Ranger2™ Terminations

Shrink Fit Terminations, 15 thru 35kV

Product Selection Guide

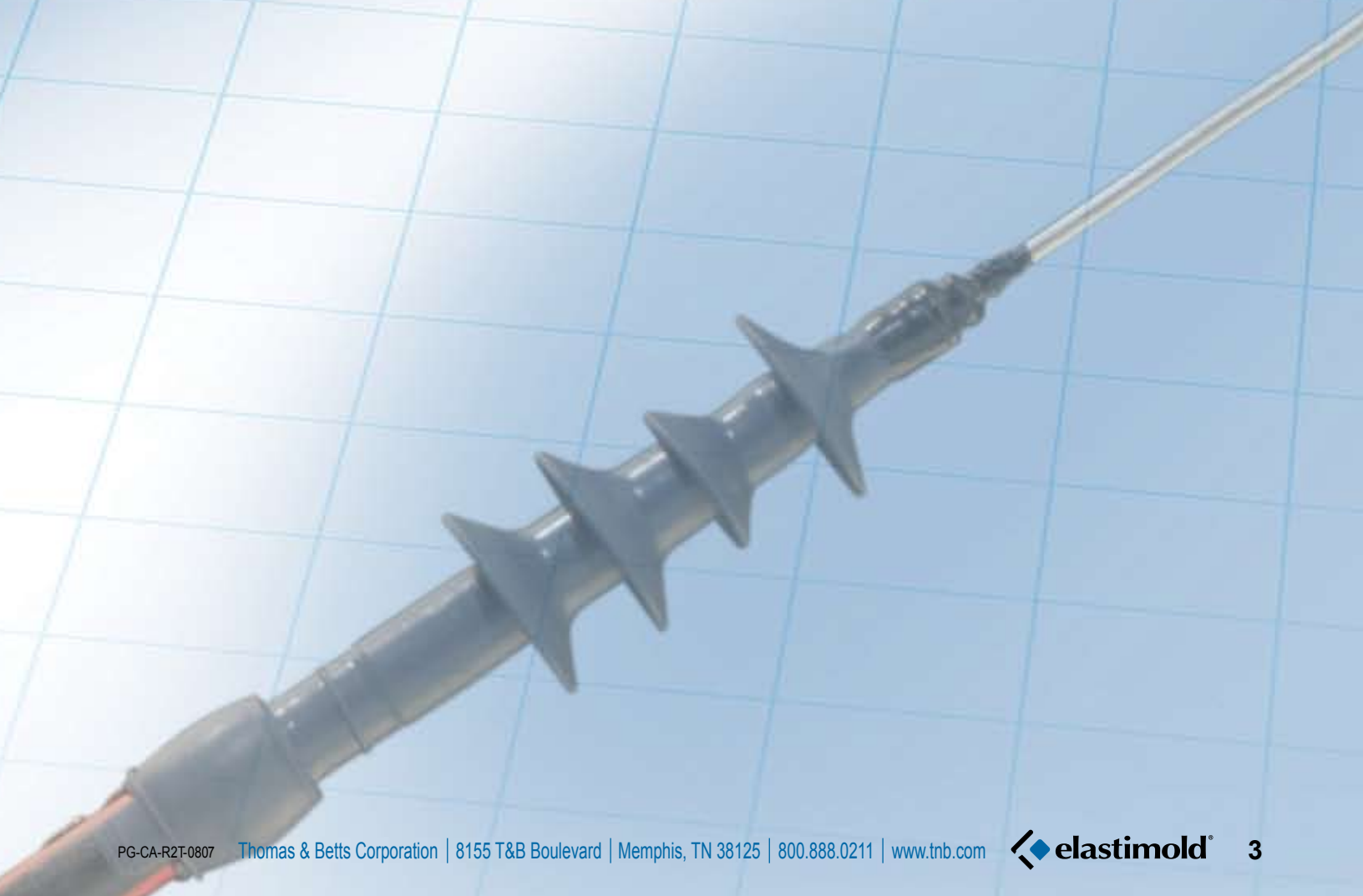
Thomas&Betts

elastimold®

Elastimold® Ranger2™ Terminations have been specifically designed for use on 15 thru 35kV, XLP or EPR insulated, underground power distribution cable systems. Units allow proper transition and connection of the underground cable system to bare overhead conductors and live front equipment. Applications include indoor, outdoor, riser pole, padmounted and other livefront or weather exposed installations. Designs use advanced silicone rubber insulating materials to provide necessary creep, strike, weather sealing and contamination resistance assuring proper performance in the most severe conditions. The gray color aids blending in with outdoor environments.

Ranger2 Terminations feature a wide application range with only 3 sizes required to cover #2 thru 1250 kcmil cables. The single piece 15kV and 25kV shrink fit design makes installation effortless and the two piece 35kV design facilitates easier core removal. Simply position the terminator on the prepared cable and remove the center core. Units are compact and lightweight allowing installation in restricted spaces and free hanging applications.

Ranger2 Terminations



Silicone Polymer Housings

The R2T and R2IT terminations are manufactured using an optimized weather resistant silicone formulation. The housing offers superior cable sealing and voltage withstand characteristics.

Elastimold terminations meet or exceed all requirements of IEEE Standard 48 for Class 1 outdoor or Class 2 indoor terminations. Unit tests include voltage withstand wet and dry, before and after load cycling on units installed on maximum conductor sized cable.

Stress Relief

The R2T and R2IT terminations provide electric stress control for the cable by means of a flexible tube with a high permittivity dielectric constant.

The stress relief tube is preassembled on the core under the polymer housing. As the core is removed, the stress relief tube and housing shrink onto the cable at the same time, in exactly the right position. No secondary operations are required during installation. The electrical fields are refracted through the high dielectric constant tube and housing as shown.

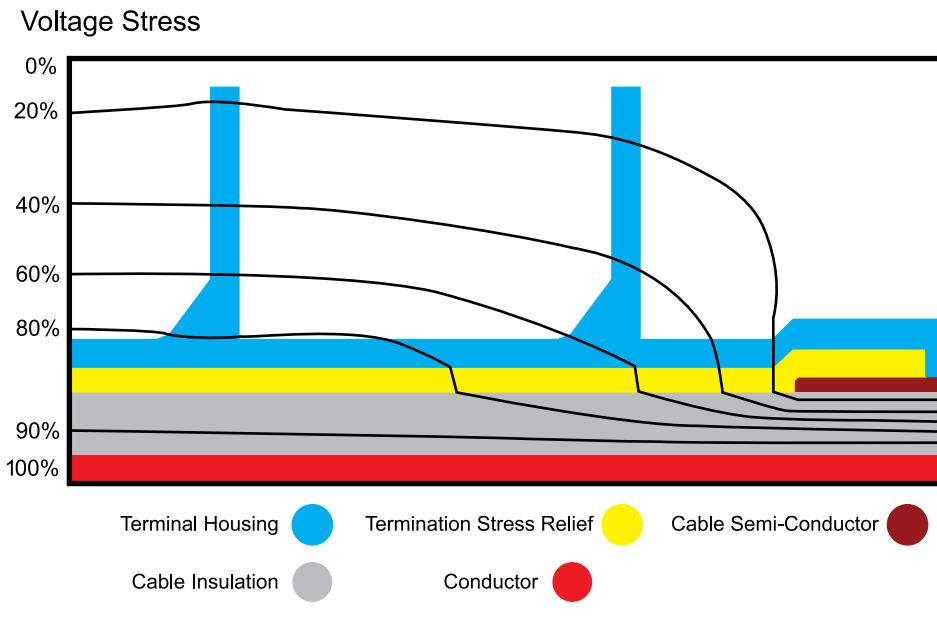
Installation

Standard cable preparation techniques are used for all R2T, Elastimold Ranger2 Outdoor Terminations, and R2IT, Elastimold Ranger2 Indoor Terminations. The Elastimold shrink fit terminations are assembled on a removable core. After the termination is placed onto the prepared cable, the core is removed by pulling on the end. The housing then collapses onto the prepared cable. Memory of the material provides the interface solid dielectric and sealing properties required to meet the electrical ratings and prevent the ingress of moisture.

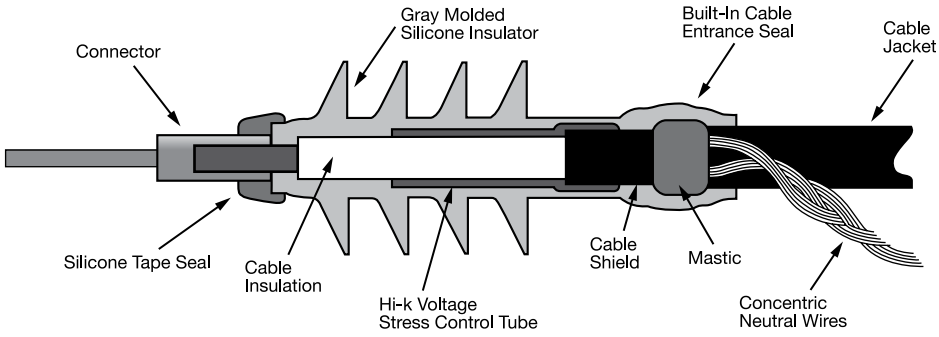
Kit Contents

Every R2T and R2IT comes complete with housing and stress tube preassembled on the core, ready for installation. Easy to read installation instructions will take you from cable preparation through installation. All kits include a tube of silicone grease, two plastic gloves, one strip of self-fusing silicone tape and mastic for sealing. Metallic Tape (M) kits include a grounding adapter for the Tape Shield, Wire Shield and UniShield cables. LC Shield (L) kits include a high ampacity grounding adapter for Longitudinally Corrugated Shield, Tape Shield and Wire over Tape Shield cables.

STRESS RELIEF



TYPICAL INSTALLATION ON JACKETED CONCENTRIC NEUTRAL (JCN) CABLE



FEATURES	BENEFITS / DESCRIPTION
Silicone polymer housing	Superior memory and weathering characteristics
Shrink fit housing	Uses common installation procedures and cable preparation dimensions. Field removable center core allows for easy installation
Three different shed designs for superior weathering	• Four sheds for 15kV outdoor model • Six sheds for 25/28kV outdoor model • Eight sheds for 35kV outdoor model
Wide range	Three sizes cover entire cable range from #2 to 1250 kcmil. Units accommodate popular XLP and EPR cable types and shield constructions
Integral Hi-K voltage stress control tube	Provides uniform voltage grading over the length of the termination. Eliminates damaging voltage stress concentrations at the cable insulation shield edge. Thick wall construction securely maintains critical interface pressure for consistent long term reliability and performance
Pull down tabs for easy installation of built-in jacket seal	Accomodates CN, JCN, Tape, Wire or LC shielded cable construction
Light weight compact design	Installs in restricted spaces. Permits application where free hanging is desired
Dark gray molded silicone insulator	Blends well into outdoor environments. Utilizes specially formulated silicone materials with improved UV stability, track, erosion and weather resistance. Outdoor styles feature large diameter, multi-shed profile with extra creep and strike for enhanced performance under the worst environmental conditions
Optional connectors	Connector with copper stem, one hole and two hole spade connector
Optional cable and support bracket	Three sizes, ranging from 0.80" - 1.95"OD

Certified

Elastimold Ranger2 Terminations have been designed and tested per applicable portions of ANSI, IEEE, AEIC, ICEA and other industry standards.

IEEE 48	Standard for indoor and outdoor cable terminations
ANSI C119.4	Standard for cable connectors for aluminum and copper conductors
AEIC CS8-06 & ANSI/ICEA S-94-649-2004 & S-97-682-2000	Standards for XLP and EPR insulated cables

RATINGS	Indoor	Outdoor	Outdoor	Outdoor
Termination Catalog Series	R2IT15	R2T15	R2T28	R2T35
Sizes Available*	1, 2, 4	1, 2, 4	2, 4	2, 4
Voltage Rating (kV)	15	15	25/28	35
Max. Design Voltage to Ground (kV)	9.5	9.5	16	22
Corona Extinction Voltage (kV) (≤3 p.c.) (Partial Discharge)	13	13	22	30
Insulation Withstand Voltage:				
Lightning Impulse (BIL Dry 110 Withstand) (kV Crest)	110	110	150	200
10 Sec. Wet (60 Hz) (kV)	–	45	60	80
1 Minute Dry (60 Hz) (kV)	50	50	65	90
5 Hour Dry (60 Hz) (kV)	35	35	55	75
DC Withstand 15 min. Dry (kV)	75	75	105	140
APPLICATION INFORMATION				
IEEE 48 Classification	Outdoor = Class 1A, Indoor = Class 2			
Ambient Temperature Range	-30 to +65 degrees Centigrade			
Power System Frequency	48 to 62 Hz			
Altitude Range	3300 feet max			
Mounting	Free hanging or optional bracket			

DIMENSIONS	Indoor	Outdoor	Outdoor	Outdoor
Termination Catalog Series	R2IT15	R2T15	R2T28	R2T35
Sizes Available*	1, 2, 4	1, 2, 4	2, 4	2, 4
Voltage Rating (kV)	15	15	25/28	35
Number of Sheds	0	4	6	8
Minimum Strike Distance in (mm)	8.4 (213)	11.6 (295)	14.5 (368)	16.8 (427)
Creepage Distance in (mm)	8.4 (213)	15.0 (381)	22.8 (579)	30.0 (762)

*See page 7 for cable insulation diameter ranges.

Ranger2 Terminations

The R2T and R2IT termination design couples shrink fit technology and Elastimold's pull down jacket seal feature to provide a termination line that covers the widest range of applications with the fewest number of models. Three sizes cover 0.64" (16 mm) to 2.10" (53 mm) insulation diameter cables (#2 through 1250 kcmil).

The R2T housings are designed for maximum performance in all field conditions with superior creepage and strike distances for long-term service. Insulating silicone sleeves are also available when more creepage is required or when wildlife protection is needed to insulate the connectors. Contact your Elastimold Sales Representative for further information.

RANGER2 TERMINATIONS BASE CATALOG NUMBERS

			Cable Range (Insulation Diameter)		Catalog Number		
	kV Class	Type	Inches	mm	Concentric Neutral & Jacketed Concentric Neutral Cable	Tape Shield, Wire Shield & UniShield Cable	LC Shield, Wire over Tape Shield & Tape Shield Cable
	15	Indoor	0.64 to 1.12	16.3 to 28.4	R2IT15J1	R2IT15M1	R2IT15L1
			0.84 to 1.38	21.3 to 35.1	R2IT15J2	R2IT15M2	R2IT15L2
			1.30 to 2.10	33.0 to 53.3	R2IT15J4	R2IT15M4	R2IT15L4
	15	Outdoor	0.64 to 1.12	16.3 to 28.4	R2T15J1	R2T15M1	R2T15L1
			0.84 to 1.38	21.3 to 35.1	R2T15J2	R2T15M2	R2T15L2
			1.30 to 2.10	33.0 to 53.3	R2T15J4	R2T15M4	R2T15L4
	25/28	Outdoor	0.84 to 1.38	20.3 to 35.1	R2T28J2	R2T28M2	R2T28L2
			1.30 to 2.10	33.0 to 53.3	R2T28J4	R2T28M4	R2T28L4
	35	Outdoor	0.84 to 1.38	20.03 to 35.1	R2T35J2	R2T35M2	R2T35L2
			1.30 to 2.10	33.0 to 53.3	R2T35J4	R2T35M4	R2T35L4

RANGER2 TERMINATION ACCESSORIES CONNECTOR OPTIONS					
	Type	Material	Conductor	Conductor Size	Connector Prefix*
	Stem Compression Connector	Aluminum	Aluminum or Copper	#2 through 4/0 (35-107 mm²)	T0
		Aluminum	Aluminum Only	#2 through 4/0 (22-107 mm²)	T1
	One Hole Spade Connector	Tinned Aluminum	Aluminum or Copper	1/0 through 750 kcmil (55-380 mm²)	H0
	Two Hole Spade Connector	Tinned Aluminum	Aluminum or Copper	#2 through 1250 kcmil (22-630 mm²)	N0

*See page 9 for conductor code.

Cable Support Bracket Options

Ranger2 Terminations are compact, lightweight and frequently allow use of free hanging mounting methods. Optional cable support brackets are available if required.

OPTIONAL CABLE SUPPORT BRACKETS				
	Type	Cable Range (Overall O.D.)	Catalog Number	Suffix Number
	Single Clamp	0.80" - 1.25" (20-32 mm)	JB-1	B1
	Single Clamp	1.10" - 1.50" (28-38 mm)	JB-2	B2
	Double Clamp	1.45" - 1.95" (37-50 mm)	JB-3	B3

Ordering Information

Ranger2 Terminations may be ordered in components or as complete kits by following the steps outlined and using the model below to develop the catalog number for your application. Contact your local Elastimold Sales Representative for special requirements.

CATALOG CONSTRUCT

HOUSING ONLY - **ADD A CONNECTOR** - **ADD A CABLE SUPPORT BRACKET**

XXX XX X X - XX XXX - XX

TYPE	
Outdoor	R2T
Indoor	R2IT

kV CODE	
15kV	15
25/28kV	28
35kV	35

CABLE TYPE	
Concentric Neutral/Jacketed Concentric Neutral	J
Tape Shield/Wire Shield/ UniShield	M
LC Shield Tape Shield/Wire Over Tape Shield	L

INSULATION RANGE	
0.64"-1.12" (16 mm-28 mm) (15kV only)	1
0.84"-1.38" (21 mm - 35 mm) (15kV, 25kV, 35kV)	2
1.30"-2.10" (33 mm-53 mm) (15kV, 25kV, 35kV)	4

CONNECTOR TYPE	
Universal Aluminum Barrel for AL or CU conductor w/Copper Wire Lead #2-4/0	T0
Aluminum Barrel for AL conductor only w/Copper Wire Lead #2-4/0	T1
Aluminum 1-hole Spade 1/0-750 kcmil	H0
Aluminum 2-hole Spade #2-1250 kcmil	N0

STRANDED OR COMPRESSED	COMPACT OR SOLID	CONDUCTOR CODE
-	#2	210
#2	#1	220
#1	1/0	230
1/0	2/0	240
2/0	3/0	250
3/0	4/0	260
4/0	250	270
250	300	280
300	350	290
350	400	300
400	500	310
500	600	330
600	750	350
750	900	380
1000	1000	410
1250	1250	440

CABLE MOUNTING BRACKET	
0.80"-1.25" (20-32 mm)	B1
1.10"-1.50" (28-38 mm)	B2
1.45"-1.95" (37-50 mm)	B3

CONNECTOR ONLY

Step 1. Select the Termination Housing:

A. Select Outdoor or Indoor housing style

B. Select applicable voltage class

C. Select neutral/ shield type

D. Select the size based on the cable insulation diameter*

Connector Option

Step 2. Select the Connector:

E. Select desired connector

F. Select connector code based on conductor size and conductor type

Cable Support Bracket Option

Step 3. Select the Cable Support Bracket:

G. Select cable support bracket based on the overall O.D. of the cable

* To help in selecting the proper terminator, ICEA and AEIC standard dimensions for XLP & EPR cables are shown in Elastimold Product Guide for Cable Accessories, PG-CA.

TYPICAL INSTALLATION OF ELASTIMOLD SHRINK FIT TERMINATIONS (R2T-Outdoor) and (R2IT-Indoor)

Step 1. Train the cable into position and cut to length. Using standard practices, cut back the cable jacket, metallic shield, semiconductive shield and cable insulation exposing the conductor.

Step 2. Finish preparing the metallic shield. For concentric neutral or jacketed concentric neutral cables, bend back the neutral wires and seal with mastic strips and vinyl tape.

For metallic tape, drain wire, UniShield or LC Shield cables: install the ground braid using the constant force spring and seal with mastic strips and vinyl tape.

Step 3. Clean the exposed conductor, install and crimp the connector.

Step 4. Use mastic and vinyl tape to fill any gap or step between the connector and the cable insulation. Clean the cable.

Step 5. Apply a liberal bead of silicone lubricant to the semi-con shield step.

Step 6. Pull the loose end of the core cord until the core is even with the end of the termination housing.

Step 7. Position the terminator onto the cable.

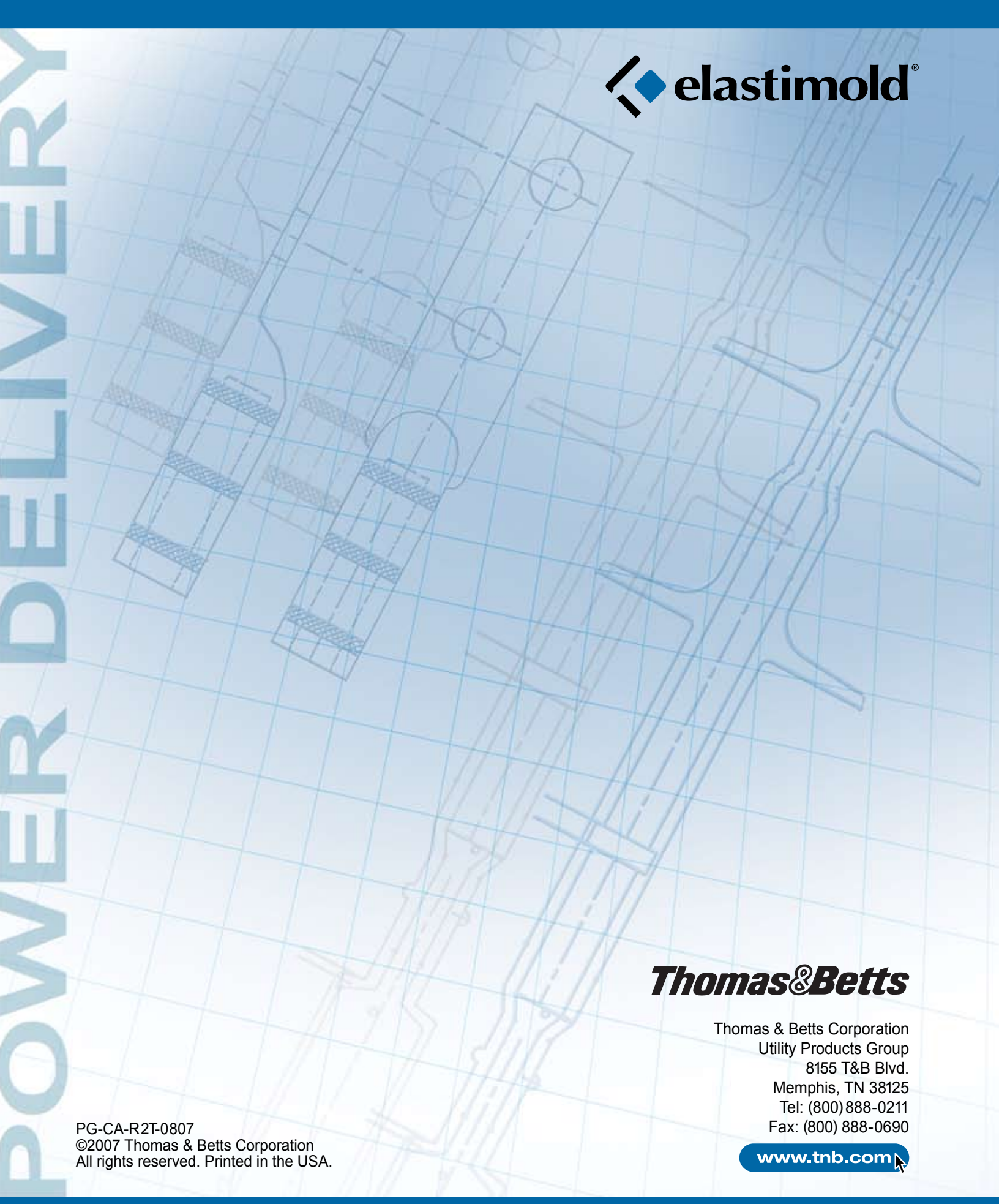
Step 8. Shrink into place by unwinding the removable core.

Step 9. Apply silicone lubricant to skirt and mastic area.

Step 10. Fold down the skirt over the mastic to seal the cable entrance.

Step 11. Seal the top of the terminator at the connector area with silicone tape.

Step 12. Attach the neutral wires or optional ground braid to the system ground per local code. Install the optional cable support bracket if required.



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