Energy Division



Heat-shrinkable wall feedthroughs for cables with plastic and rubber oversheaths

Power cables brought into buildings underground create a water and gas sealing problem at the cellar wall. Water in the cable trench can flow into the building unless a reliable seal is made between the hole in the concrete and the cable oversheath. An effective bond is required both to various types of concrete wall and mortar, and to polymeric cable materials. In addition, the sealing system must withstand thermal expansion and contraction of the cable over long time periods, as well as soilsetting. Practical considerations place further demands on the design. The product should be suitable for immediate use, but also capable of being buried in the ground for future requirements. A re-usable system is desirable to simplify cable replacement.

Sealing between the feedthrough and the wall

The Raychem feedthrough consists of a galvanized steel spiral over which a longer heat-shrinkable tubing is installed. The resulting corrugated spiral surface acts as a labyrinthlike path to obstruct moisture flow between the feedthrough and the wall. An external coating of special primer further improves adhesion to various types of concrete. The steel spiral makes the feedthrough rigid enough to permit installation during initial concrete pouring. When cables are to be taken through existing walls, quick-drying cement may be used to fix the feedthrough in place.

Sealing between the cable and the feedthrough

The heat-shrinkable tubing extends beyond the spiral at each end and is internally coated with sealant. The ends are covered with protective caps to allow the feedthrough to be left in the ground for later use. When installing the cable, these are pulled off and the ends of the tubing heated with a commonly available gas torch. This causes the tubing to shrink in diameter to fit the cable, at the same time as the sealant melts and flows. The ease and reliability of this sealing technique has been proven in millions of Raychem buried cable accessories and corrosion protection systems.



Cable replacement

The Raychem design allows removal of the cable and replacement with any of a range of sizes of new cable.

Performance

Tests at independent laboratories and Raychem facilities have demonstrated the wall feedthrough's ability to establish an effective seal against water and gas. Typically the sealing surface between cable and feedthrough withstood a differential pressure of 0.02 MPa applied inside the feedthrough and at least 0.1 MPa acting externally. When the feedthrough was properly installed in the wall, the sealing interface between feedthrough and wall withstood at least 0.1 MPa gas or water pressure. These results are confirmed by over 25 years' reliable service of installed units, and recognition by trade and engineering institutes such as, for example, the German DVGW (Deutscher Verein des Gas und Wasser Faches e.V.). A detailed test report is available. Ravchem wall feedthroughs are one result of Raychem's capability in materials science. As the leader in heat-shrinkable materials and one of the largest cable accessory makers, Raychem offers a wide range of sealing, corrosion protection, repair and insulating systems, each specifically developed to meet the needs of power supply and construction industries.



Heat-shrinkable wall feedthroughs for cables with plastic and rubber oversheaths

Heat-shrinkable Tubing Properties for Wall Feedthrough Tensile Strength Ultimate Elongation		Test Method		Material Requirements 14 MPa min. 350% min.			
		ISO 37					
		ISO 37					
Hardness		ISO 868		50-70 shore D			
Low Temperature Flexibility	4 hours at -40°C ±3°C	ASTM D2671	Procedure C	No cracking			
Water Absorption		ISO 62	Method 1	0.25% max. after14 days at 23°C ±2°C			
Solvent Resistance	7 days at 23°C ±2°C in transformer oil to VDE 0370	ISO 1817					
	Tensile Strength	ISO 37		14 MPa min.			
	Ultimate Elongation	ISO 37		300% min.			
Additional Properties		Further details are given in Raychem specification PPS 3010/19					



Raychem Part Number	Application Range (diameter)	H a min.	b max.	D ±3	P +20 - 35	R ±20	S ±15	T ±15
EPAF 2004	8- 14	16	8	23	700	90	520	330
EPAF 2008	12- 25	28	10	36	700	90	520	330
EPAF 2010	18- 36	41	16	50	800	90	620	430
EPAF 2020	29- 56	59	26	70	700	90	520	330
EPAF 2030	55- 98	106	54	120	760	115	530	330
EPAF 2040	88- 140	150	80	165*	600	100	400	330*

Notes: 1. Drawing depicts typical part

* = approx. dimensions

Raychem wall feedthroughs are supplied complete with detailed installation instructions.

For further details on this or any other Raychem products please contact your local sales representative.

All of the above information, including drawings, illustrations and graphic designs, reflects our present understanding and is to the best of our knowledge and belief correct and reliable. Users, however, should independently evaluate the suitability of each product for the desired application. Under no circumstances does this constitute an assurance of any particular quality or performance. Such an assurance is only provided in the context of our product specifications or explicit contractual arrangements. Our liability for these products is set forth in our standard terms and conditions of sale. ALR, AMP, AXICOM, B&H, BOWTHORPE EMP, CROMPTON INSTRUMENTS, DORMAN SMITH, DULMISON, GURO, HELLSTERN, LA PRAIRIE, MORLYNN, RAYCHEM, and SIMEL are trademarks.



Energy Division - a pioneer in the development of economical solutions for the electrical power industry. Our product range includes: cable accessories, connectors & fittings, electrical equipment, instruments, lighting controls, insulators & insulation enhancement and surge arresters.

For more information and your country contact person, please visit us at: http://energy.tycoelectronics.com

Tyco Electronics Raychem GmbH, Energy Division Finsinger Feld 1, 85521 Ottobrunn/Munich, Germany Phone: +49-89-6089-0, Fax: +49-89-6096345

^{2.} Dimensions in millimeters

a = as supplied

b = after free recovery