

## INSTRUCTION FOR UL LISTED EYSEF AND EYDEF SERIES EXPANDED FILL SEALING FITTINGS APPROVED FOR USE WITH: APPLETON Kwiko<sup>®</sup>, Kwiko A<sup>™</sup> AND CROUSE-HINDS Chico A<sup>®</sup> SEALING CEMENT

- The National Electrical Code in Article 501 Section 501-5 Class I, Division 1 and 2, requires that seals be installed in specific locations. This is to prevent the passage of gases, vapors or flames through the conduit from one portion of the electrical installation to another portion.
- Appleton sealing Unilets<sup>®</sup> are UL listed for use in hazardous locations with Appleton Kwiko, Kwiko A, or Crouse-Hinds Chico A compound only. These compounds, when properly mixed and poured, harden into a dense and strong mass which is insoluble in water, is not attacked by petroleum products and is not softened by heat.

**WARNING:**  
*Failure to follow safety instructions may cause ignition of hazardous atmosphere resulting in serious personal injury and / or property damage.*



Mineral Fiber Filler "Asbestos Free"



"Asbestos Free" Sealing Cement. Be sure to read the mixing instructions on Sealing cement can.

**STEP 1.**

Install unilet and pull conductors through.  
 • Remove plug(s) from sealing fitting and use fiber filler to make dam (s) in hub(s).

**STEP 2.**

**DAMMING:** Separate each conductor and pack fiber filler tightly into hub(s) behind conductors and around each conductor.  
 • These conductors **must not touch each other** nor the sealing fitting wall.  
 • Clean fiber shreds away from walls or conductors to prevent them from causing flame and / or leakage of gases. Finished dam must be flush with conduit hub bushing.

**CAUTION**  
Refer to Table 1 to determine the maximum number and size of conductors allowed in a seal. (Page 4)

**STEP 3.**

**Mixing:** Prepare sealing compound using a completely clean mixing vessel in each batch. Shake the sealing cement thoroughly in all directions. Mix sealing cement with correct proportion of clean water as noted below.

**APPLETON Kwiko CEMENT.** Add 3 fluid ounces of water to 1 lb. of cement, equivalent to 1 part water to 3 parts cement by volume, for a minimum of 5 minutes or until an even pouring consistency is obtained.

**APPLETON Kwiko A and CROUSE-HINDS Chico A CEMENT.** Add one (1) part water to two (2) parts cement by volume. Use cold water, warm water increases setting speed. Add water and stir immediately and thoroughly.  
 • **DO NOT** mix more than can be poured in 15 minutes after adding water.  
 • These cements are **NOT INSULATING COMPOUNDS** and **MUST NOT** be used for such purposes.

**CAUTION: Temperature / Cure Time**  
**Appleton Kwiko Cement** must not be mixed and poured at temperature below 35°F (1.7°C).  
 Cement compound curing time varies with temperatures. Examples are: 35°F (1.7°C) - 24 hrs., at 68°F (20°C) - 4 hrs.

**APPLETON Kwiko A and CROUSE HINDS Chico A CEMENT**  
**FOR APPLICATIONS INVOLVING GROUP C AND D**  
**CAUTION:** Sealing compound to be mixed **ONLY** at temperatures above 35°F (1.7°C) and **ONLY** poured into fittings that have been brought to a temperature above 35°F (1.7°C). Seals must **NOT** be exposed to temperatures below 35°F (1.7°C) for at least 8 hours.

**FOR ALL APPLICATIONS**

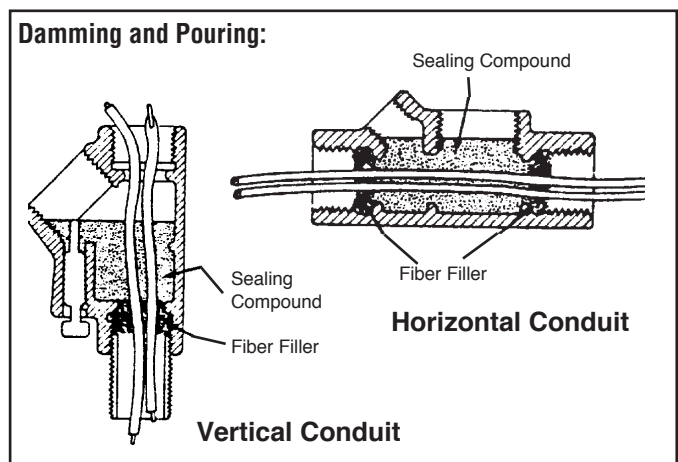
**CAUTION:** Sealing compound to be mixed **ONLY** at temperatures above 40°F (4.4°C) and **ONLY** poured into fittings that have been brought to a temperature above 40°F (4.4°C). Seals must **NOT** be exposed to temperatures below 40°F (4.4°C) for at least 72 hours.

**STEP 4**

**VERTICAL CONDUIT RUN.** Pour sealing cement mixture into the small pipe opening until the cement is level with the last thread of the opening. Replace and tighten small pipe plug.

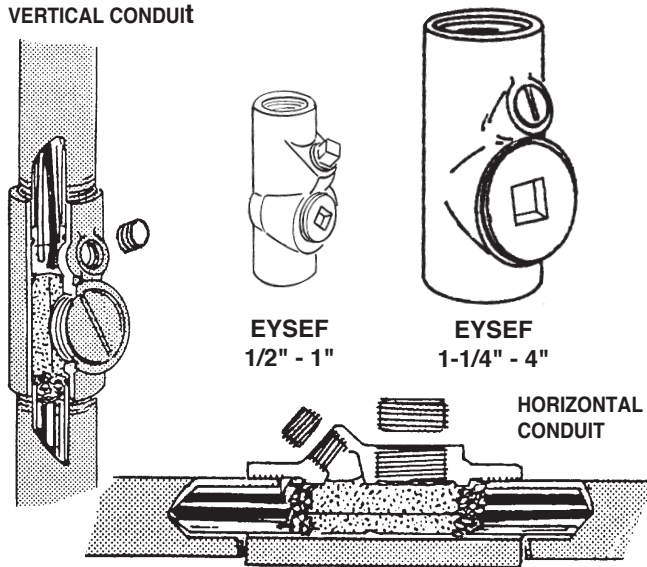
**HORIZONTAL CONDUIT RUN.** Pour sealing cement mixture into the Unilet through the large opening until two (2) to three (3) threads are covered with the cement.

- Replace and tighten in sequence the large pipe plug or cover the small pipe plug into the Unilet and the small pipe plug into the cover.



**EYSEF SEALING UNILETS 1/2" TO 4"**  
**EXPLOSION PROOF, DUST-IGNITION-PROOF**  
**FOR USE IN: IN VERTICAL AND / OR**  
**HORIZONTAL CONDUIT RUNS**

**VERTICAL CONDUIT**



**NOTE:** On sizes 3", 3-1/2" and 4" the cover should be tightened down with the small pipe plug removed from it. This will allow excess cement or air to escape out rather than seeping through or pushing the dam into the conduit. When the large cover has been tightened fully, replace pipe plug.

**CAUTION**

Remove any cement from threads in order to allow a minimum of 5 threads engagement of fitting threads, close plug and drain / breather.

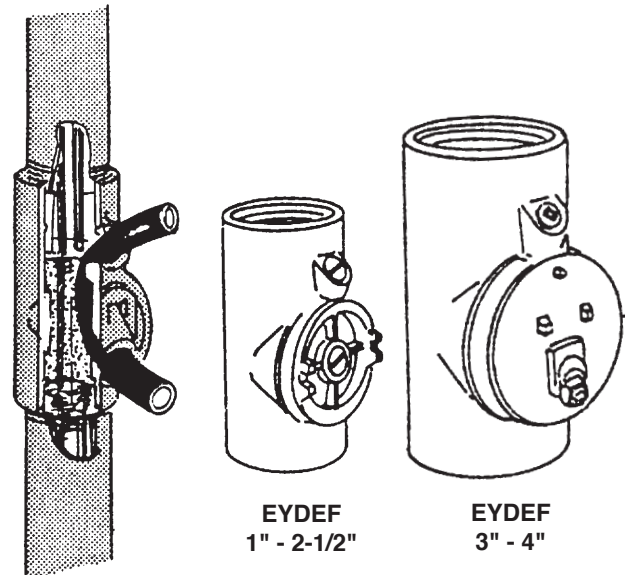
**Vertical conduit**

1. Install Unilet and pull conductors through.
2. Remove the pipe plug where the cement will be poured through and the large pipe plug or cover with the small pipe plug for size 3", 3-1/2" and 4" at the center of the Unilet.
3. Dam the lower hub with fiber filler. (Page 1, Steps 1 & 2.)
4. Replace the large pipe plug or cover with the small pipe plug for 3", 3-1/2" and 4" Unilet, tighten all threaded joints securely.
5. Mix Sealing Cement with the correct proportion of water per instructions provided with the cement. (Page 1, Step 3).
6. Pour Sealing Cement mixture into the small pipe plug opening until the cement is level with the last thread of the opening.
7. Replace and tighten small pipe plug.

**Horizontal conduit**

1. Install Unilet and pull conductors through.
2. Remove all pipe plugs and / or cover from the Unilet.
3. Dam both hubs with fiber filler. (Page 1, Steps 1 & 2)
4. Mix Sealing Cement with the correct proportion of water per instructions provided with the cement. (Page 1, Step 3.)
5. Pour Sealing Cement mixture into the Unilet through the large opening until 2-3 threads are covered with the cement.
6. Replace and tighten in sequence the large pipe plug or cover, the small pipe plug into the Unilet and the small pipe plug into the cover.

**EYDEF DRAIN AND SEALING UNILETS**  
**CLOSE TURNING RADIUS DRAIN AND SEALING**  
**UNILETS, EXPLOSION-PROOF, DUST-IGNITION-**  
**PROOF, FOR USE IN VERTICAL CONDUIT RUNS**



**EYDEF**  
**1" - 2-1/2"**

**EYDEF**  
**3" - 4"**

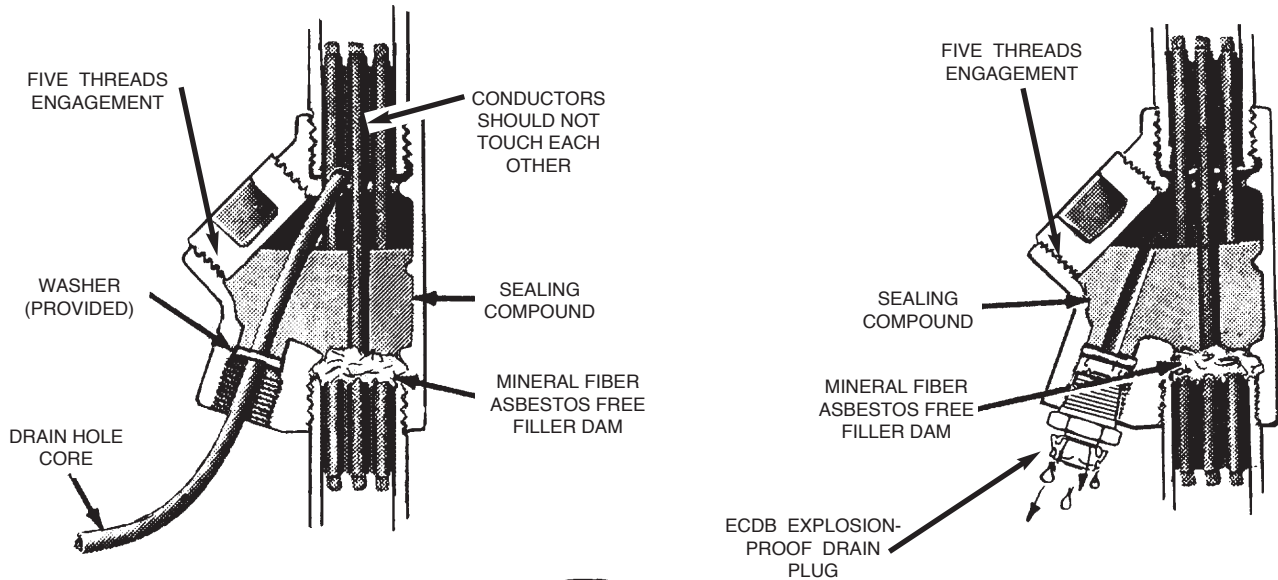
**CAUTION**

Remove any cement from threads in order to allow a minimum of 5 threads engagement of fitting threads, close plug and drain / breather.

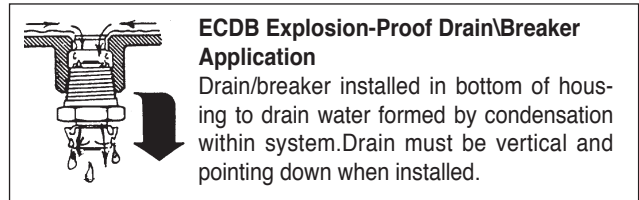
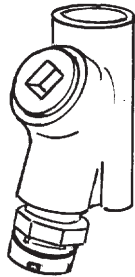
**EYDEF SERIES 1" TO 4"**

1. Install Unilet and pull conductors through.
2. Remove the large threaded cover from the Unilet.
3. Dam the lower hub opening with fiber filler. (Page 1, Step 2).
4. Replace the large threaded cover so that the threaded hole is facing downward.
5. Insert the tube and wire drain core into the opening of the large threaded cover so that the end being inserted will be above the compound in a completed seal. (See illustration on this page).
6. Be sure that the tube and wire drain core do not touch any of the conductors, Otherwise, this will expose the conductors in the completed and hardened seal. (See illustration on this page).
7. Mix Sealing Cement with the correct proportion of water per instructions provided with the cement. (Page 1, Step 3).
8. Pour Sealing Cement mixture into the Unilet through the opening located above the large cover until the last thread is covered with cement.
9. After cement has cured, (see page 1, "Caution: For temperature / cure time") pull out the old tube and wire drain core and discard.
10. Thread the small pipe plug into this opening and tighten .
11. Thread ECDB drain-breather fitting into large cover threaded hole and tighten securely.

# EYDEF DRAIN AND SEALING UNILETS EXPLOSION PROOF, DUST IGNITION PROOF FOR USE IN VERTICAL CONDUIT RUNS



EYD Fitting with a ECDB  
Explosion-Proof Drain application



## EYDEF SERIES 1/2" AND 3/4"

1. Install Unilet and pull conductors through.
  2. Remove the pipe plug.
  3. Dam the lower hub opening with fiber filler. (See page 1, steps 1 and 2)
  4. Insert rubber drain-hole core through drain opening and washer (provided) high enough so inner end of core will be above sealing compound in completed seal.
- Note:** Washer (provided) must be inserted to last thread to form dam for sealing compound. (See illustration above).
5. Be sure that the rubber drain - hole - core does not touch any of the conductors.
  6. Mix Sealing Cement with the correct proportion of water per instructions provided with the cement (Page 1, Step 3.).
  7. Pour Sealing Cement mixture into the Unilet opening until the cement is level with the last thread of the opening.
  8. Replace and tighten pipe plug.
  9. When cement has cured (see page 1, **Caution:** Temperature / cure time") remove drain - hole - core.
  10. Thread ECDB drain - breather fitting into threaded hole and tighten securely.

### CAUTION

Remove any cement from threads in order to allow a minimum of 5 threads engagement of fitting threads, close plug and drain / breather.

# MAXIMUM NUMBER OF CONDUCTORS THAT CAN BE SEALED IN A SEALING FITTING, APPLETON CATALOG NUMBER SERIES EYSEF AND EYDEF

**TABLE 1**

Steps to determine size of sealing fitting to use based on maximum 40% fill rulling.

- Determine cross sectional areas of conductors. (Refer Chapter 9, Table 5 of the NEC - 1993 Dimensions of Insulated Conductors and Fixture Wires)
- Determine total area occupied by conductors.
- Determine required conduit size sealing fitting based upon a value equal to or greater than calculated total area occupied by conductors versus total maximum percentage fill area allowed by each corresponding size sealing fitting. (See table below for values)

...Illustration No. 1 (Wires or conductors of the same sizes and types).  
 Determine required conduit size sealing fitting based on this maximum 40% fill rulling for, 3 No. 10 THWN, 5 No. 12 THW and 5 No. 250 kcmil XHHW conductors.

**Solution:**  
 No. 12 THHN cross sectional area = 0.0117  
 Total conductor area = 16 x .0117 = 0.1872  
 Hence 40% maximum conductor fill for 3/4" size sealing fitting = 0.21 sq. inches (meets this requirement).

...Illustration No. 2 (Wires or conductors of different sizes and types)  
 Determine required conduit size sealing fitting based on this maximum 40% fill rulling for, 3 No. 10 THWN, 5 No. 12 THW and 5 No. 250 kcmil XHHW conductors.

**Solution:**  
 3 No. 10 THWN cross sectional area = 3 x .0184 = 0.0552  
 5 No. 12 THW cross sectional area = 5 x .0172 = 0.0860  
 5 No. 250kcmil XHHW cross sectional area = 5 x .4026 = 2.0130  
**Total area occupied by conductors = 2.1542**  
 Hence, 40% maximum conductor fill for 3" size sealing fitting.  
 = 2.95 sq inches (meets this requirement)

Wire Types (Column A Only)	Size AWG or KCMil	CLASS I, GROUPS B, C AND D***												CL, I, GRP C&D								
		1/2" SEAL MAX. % FILL = 40% X-SEC. AREA = .12**		3/4" SEAL MAX. % FILL = 40% X-SEC. AREA = .21**		1" SEAL MAX. % FILL = 40% X-SEC. AREA = .34**		1 1/4" SEAL MAX. % FILL = 40% X-SEC. AREA = .60**		1 1/2" SEAL MAX. % FILL = 40% X-SEC. AREA = .82**		2" SEAL MAX. % FILL = 40% X-SEC. AREA = 1.34**		2 1/2" SEAL MAX. % FILL = 40% X-SEC. AREA = 1.92**		3" SEAL MAX. % FILL = 40% X-SEC. AREA = 2.95**		3 1/2" SEAL MAX. % FILL = 40% X-SEC. AREA = 3.96**		4" SEAL MAX. % FILL = 40% X-SEC. AREA = 5.00**		
		A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
TW, THW, RHW, RHH	18 16	13 11	19 15	24 19	34 27	39 31	55 43	68 55	97 76	131 103	92 75	152 123	217 170	217 176	309 242							
RHW and RHH (without outer covering), THW	14 12 10 8	6 5 4	14 10 6 3	10 8 7 3	24 18 11 5	16 13 11 6	39 29 18 9	29 24 19 10	69 51 32 16	94 69 44 22	39 32 26 13	65 53 43 22	154 115 73 36	93 76 61 32	220 164 104 51	143 117 95 49	160 79	192 157 127 66	106 85	136		
TW XHHW (AWG14-6)	14 12 10 8	9 7 5 2	14 10 6 3	15 12 9 4	24 18 11 5	25 20 15 7	39 29 18 9	44 35 27 12	69 51 32 16	94 69 44 22	60 47 37 17	99 78 60 28	154 115 73 36	142 111 86 40	220 164 104 51	171 133 62	160 79	178 84	106	108	136	
TW,	6 4 3 2 1 1/0	1 1 1 1 1	2 1 1 1 1	2 2 1 1 1	4 2 2 1 1	4 3 2 1 1	6 4 3 2 2	7 5 4 3 2	11 7 6 5 4	15 9 8 5 4	10 7 6 4 3	16 12 10 8 7	26 16	23 17	37 22	36 27	57 35	48 36	76 47	62 47	98 60	
THW,	250 300 350 400 500					1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	2 2 2 2	3 3 3 3	5 4 4 3	6 5 4 4	7 6 5 5	8 7 6 6	10 9 7 7	13 11 9 9	14 12 10 10	17 14 12 12	18 15 13 13	22 18 15 15	
FEPB (6 thru 21), RHW and RHH (without outer covering)	600 700 750 800 900 1000 1250 1500 1750 2000									1 1 1 1	1 1 1 1	1 1 1 1	1 1 1 1	2 2 2 2	2 2 2 2	3 3 3 3	3 3 3 3	4 4 4 4	4 4 4 4	5 5 5 5	5 5 5 5	

Col.B FEP, TH-HN, THWN, TFN, PF, PGF  
 XHHW (AWG4-2000 MCM))  
 FEPB (AWG 14-8)

\*\*\* Maximum usable conduit cross section area as specified.  
 (Example: For 3 conduit seal 100%) cross sectional area = 7.38 sq. inches.  
 therefore from above maximum fill, i.e., 40% x 7.38 = 2.95 sq. inches).

\*\*\* Aluminum EYSEF -AL and EYDEF-AL Sizes 1-1/2" thru 3-1/2"  
 UL Listed for Class I Groups C & D and  
 CSA Certified for Class I Groups B, C & D

Rev. C