

INSTRUCTIONS FOR SEALING APPLETON "ES" SERIES SEALING HUBS FOR USE WITH APPLETON KWIKO®, KWIKO A™ AND CROUSE-HINDS CHICO A® SEALING CEMENT

- The National Electric Code in Article 501, Section 501-5, Class I, DIV. 1 and 2, requires that seals be installed in specific locations.
- This is to prevent the passage of gasses, vapors or flames through the conduit from one portion of the electrical installations to another portion.
- Appleton Sealing Hubs are U/L Listed for use in hazardous locations with "Kwiko, Kwiko A compound or Crouse-Hinds Chico compound only. These compounds when used properly mixed and poured, hardens into a dense and strong mass which is insoluble with water. It is not attacked by petroleum products and is not softened by heat.
- Appleton ES Sealing Hubs are used to seal vertical conduit risers in Class I, Division 1 and 2 hazardous (classified) locations as defined by the National Electrical Code (NEC). These sealing hubs may be installed vertically in a NPT threaded hub as shown in Figure 1 or with a STG steel ring and gasket assembly through slip hole in metal enclosure wall as shown in Figure 2.

WARNING: Electrical power must be turned Off before and during installation and maintenance.

- Failure to follow safety instructions may cause ignition of hazardous atmospheres resulting in serious personal injury and / or property damage.

1. Install sealing hub securely in enclosure opening and pull conductors through.
2. **DAMMING:** Separate each conductor and pack fiber filler into hub behind conductors and around each conductor.
 - These conductors **must not touch each other** nor touch the sealing fitting wall.
 - Clean fiber shreds away from walls or conductors to prevent them from causing flame and / or leakage of gasses. Finished dam must be as shown in Fig. 1 & 2.
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.



Mineral Fiber Filler "Asbestos-Free"



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

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.

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.

CAUTION: For Group B installations, compound must be allowed 72 hours to cure at full strength before energizing system.

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.

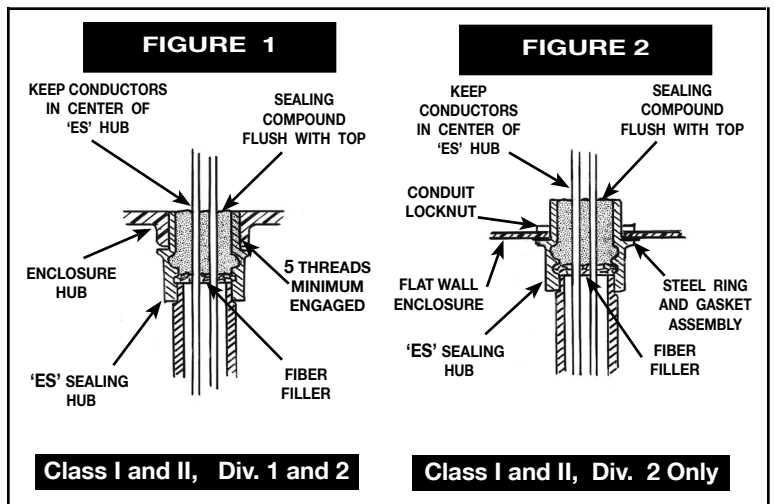
FOR ALL APPLICATIONS

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.

CAUTION: Refer to Table 1 to determine the maximum number and size of conductors allowed in a seal.

4. Pour sealing cement into hub until flush with top as shown in Figures 1 and 2, below.
5. For guidance in mixing sealing compound see Table below.
 - These cements are **NOT INSULATING COMPOUNDS** and **MUST NOT** be used for such purposes.

HUB CATALOG NUMBERS		INTERNAL VOLUME OF SEAL CAVITY
WITH OUT SEALING GASKET	WITH SEALING GASKET	
ES100-50	ES100-50BLSG	.74 cu inches
ES100-75	ES100-75BLSG	.76 cu inches
ES150-100	ES150-100BLSG	3.10 cu inches
ES200-125	ES200-125BLSG	4.69 cu inches
ES200-150	ES200-150BLSG	4.69 cu inches
ES250-200	ES250-200BLSG	9.38 cu inches
ES400-300	ES400-300BLSG	33.70 cu inches
ES500-400	ES500-400BLSG	91.23 cu inches
ES600-500	ES600-500BLSG	143.73 cu inches



Class I and II, Div. 1 and 2

Class I and II, Div. 2 Only

THE MAXIMUM NUMBER OF CONDUCTORS THAT CAN BE SEALED IN A SEALING FITTING
UNDERWRITER'S LABORATORIES (U/L 886) EFFECTIVE DATE APRIL 1, 1993

TABLE 1

The maximum number of No.4 Type THHN Conductors(Column B)permitted by UL Std.886 in a 1-1/2" size Sealing Fitting is 6.
The six (6) No.4 THHN Conductors represent the maximum wire fill of 25% or less for Sealing Fittings.
Increasing the Sealing Fitting to a 2" trade size will provide space for the 40% wire fill, or (9) No.4 Conductors, and comply with UL Std.886.

Example On How To Use Table 1

Trade Size	Conductor Size	Type	Max.No. Permitted For 25% Fill	Max.No. Permitted For 40% Fill/Trade Size Sealing Fitting Needed
1-1/2"	No.4	THHN(Col.B)	6	(9/2")

In our example, use on ES250-200 or ES250-200BLSG.

The maximum number of wires^a that can be sealed in a sealing fitting are as follows:

Size AWG or KCMil	1/2" SEAL (QTY/NPT SIZE)		3/4" SEAL (QTY/NPT SIZE)		1" SEAL (QTY/NPT SIZE)		1-1/4" SEAL (QTY/NPT SIZE)		1-1/2" SEAL (QTY/NPT SIZE)		2" SEAL (QTY/NPT SIZE)		2-1/2" SEAL (QTY/NPT SIZE)		3" SEAL (QTY/NPT SIZE)		3-1/2" SEAL (QTY/NPT SIZE)		4" SEAL (QTY/NPT SIZE)		5" SEAL (QTY/NPT SIZE)		
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	
18	7	11	12	20	20	33	35	58	49	80	80	131	115	187	176								
16	6	9	10	16	17	27	30	47	41	64	68	106	98	151	150								
14	3	8(13 3/4")	6	15(24/1")	10	24(39/1-1/4")	18	43(69/2")	25	58(94/2")	41	96(154/3")	58	137	90			121		155			
12	3	6(10 3/4")	5	11(18/1")	8(9/1-1/4")	18(29/1-1/4")	15	32(51/2")	21	43(70/2")	34(35/2-1/2")	71(114/3")	50	102(164/3-1/2")	158	76(77/3-1/2")	103		132				
10	1(2 3/4")	4(6 3/4")	4	7(11/1")	7	11(18/1-1/4")	13	20(32/2")	17(18/2")	27(44/2")	29	45(73/3")	41	65(104/3-1/2")	64	100(160/4")	86	134	110	172	173		
8	1	2(3 3/4")	2	4(5/1")	4	6(9/1-1/4")	7	11(16/1-1/2")	9	16(22/2")	16	26(36/2-1/2")	22	37(51/3")	35	58(79/4")	47	78(106/5")	60	100(136/5")	94	157	
6	1	1	1	2(4/1")	2	4(6/1-1/4")	4(5/1-1/2")	7(11/2")	6	9(15/2")	10(11/2-1/2")	16(26/3")	15	23(37/3-1/2")	23(24/3-1/2")	35(57/4")	32	47(76/5")	41	61(98/6")	64	96	
4	1	1	1	1(2/1")	1	2(4/1-1/4")	3	4(7/2")	5	6(9/2")	8	9(16/3")	12	14(22/3-1/2")	18	21(35/4")	24	29(47/5")	31	37(60/6")	49(50/6")	59	
3			1	1	1	2(3/1-1/4")	3	3(6/2")	4	5(8/2")	7	8(13/3")	10	12(19/3-1/2")	16	18(29/4")	21(22/4")	24(39/5")	28	31(51/6")	44	50	
2			1	1	1	1(3/1-1/4")	3	3(5/2")	3(4/2")	4(7/2")	6	7(11/3")	9	10(16/3-1/2")	14	15(25/4")	19	20(33/5")	24	26(43/6")	38	42	
1			1	1	1	1	1	2(3/1-1/2")	3	3(5/2")	4(5/2-1/2")	5(8/3")	7	7(12/3-1/2")	10(11/3-1/2")	11(18/4")	14	15(25/5")	18	20(32/6")	29	31	
1/0			1	1	1	1	1	2(3/2")	2	2(4/2")	4	4(7/3")	6	6(10/3-1/2")	9	9(15/4")	12	13(21/5")	16	16(27/6")	25	26	
2/0			1	1	1	1(2/1-1/2")	1	2(3/2")	3	3(6/3")	5	5(8/3")	8	8(13/4")	11	11(17/5")	14	14(22/5")	19	19(29/6")	28	28	
3/0			1	1	1	1	1	1(3/2")	3	3(5/3")	4	4(7/3")	7	7(11/4")	9	9(14/5")	12	12(18/5")	16	16(24/6")	22	19	
4/0			1	1	1	1	1	1(2/2")	2	2(4/3")	3(4/3")	3(6/3")	6	6(9/4")	8	8(12/5")	10	10(15/5")	14	14(21/6")	19	16	
250					1	1	1	1	1	1	1	2(3/2-1/2")	3	3(4/3")	5	5(7/4")	6	6(10/5")	8	8(12/5")	13	13	
300					1	1	1	1	1	1	1	1(3/2-1/2")	3	3(4/3")	4	4(6/4")	5	5(8/5")	7	7(11/5")	11	11	
350					1	1	1	1	1	1	1	1(2/2-1/2")	1(2/3")	2(3/3")	3(4/3-1/2")	3(5/3-1/2")	5	5(7/5")	6	6(9/5")	10	10(15/6")	
400					1	1	1	1	1	1	1	1	1	1	2(3/3")	3	3(5/4")	4	4(6/4")	6	6(8/5")	9	9(13/6")
500					1	1	1	1	1	1	1	1	1	1	1	3	3(4/3-1/2")	4	4(5/4")	5	5(7/5")	8	8(11/6")
600							1	1	1	1	1	1	1	1	1	1(2/3-1/2")	2(3/3-1/2")	3	3(4/4")	4	4(5/5")	6	6(9/6")
700							1	1	1	1	1	1	1	1	1	1	2(3/3-1/2")	3	3(4/5")	3	3(5/5")	6	6(8/6")
750							1	1	1	1	1	1	1	1	1	1	1(2/3-1/2")	3	3	3	3(4/5")	5	5(7/6")
800							1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	5	5
900							1	1	1	1	1	1	1	1	1	2	2	3	3	3	3	4	4
1000									1	1	1	1	1	1	1	1	1	1	1	3	3	4	4
1250											1	1	1	1	1	1	1	1	1	1	2	3	3
1500													1	1	1	1	1	1	1	1	1	3	3
1750														1	1	1	1	1	1	1	1	2	2
2000															1	1	1	1	1	1	1	1	1

^a Col.A = Types RFH-2, RH, RHH, RHW, THW, TW, XHHW (AWG 14-6), FEPP (AWG 6-2)

Col.B = FEP, THHN, THWN, TFN, PF, PGF, XHHW (AWG 4-2000 MCM), FEPP (AWG 14-8)

NOTE: For No.18 and No.16 size conductors, wire fill is based on maximum 40% fill or less depending on conduit size and conductor type per the NEC code. For all other conductor sizes and types, wire fill is based on maximum 25% fill or less depending on conduit and conductor size per U/L Std.886.