

AEIC Reduced Diameter Cable And Its Effect on Cable Accessories

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AEIC Reduced Wall Thicknesses

- Current specifications require a standard wall thickness by voltage class
- The current cable design operating at the highest stress is 35kV, 1/0, 345 mil wall
- The operating stress is 4kV/mm (101 volts/mil)
- Utilizing this stress level and applying it across all common conductor sizes a cable construction with reduced insulation wall is obtained

AEIC Reduced Wall Thicknesses

Conductor Size	Minimum Average Insulation Wall Thicknesses (mils)		
	15 kV	25 kV	35 kV
2 AWG	115	-	-
1 AWG	110	225	--
1/0 AWG	110	220	345
2/0 AWG	110	215	330
3/0 AWG	110	210	320
4/0 AWG	110	205	315
250 kcmil	110	205	305
350 kcmil	110	205	300
500 kcmil	110	200	295
750 kcmil	110	200	290
1000 kcmil	115	200	285

Cable Diameter

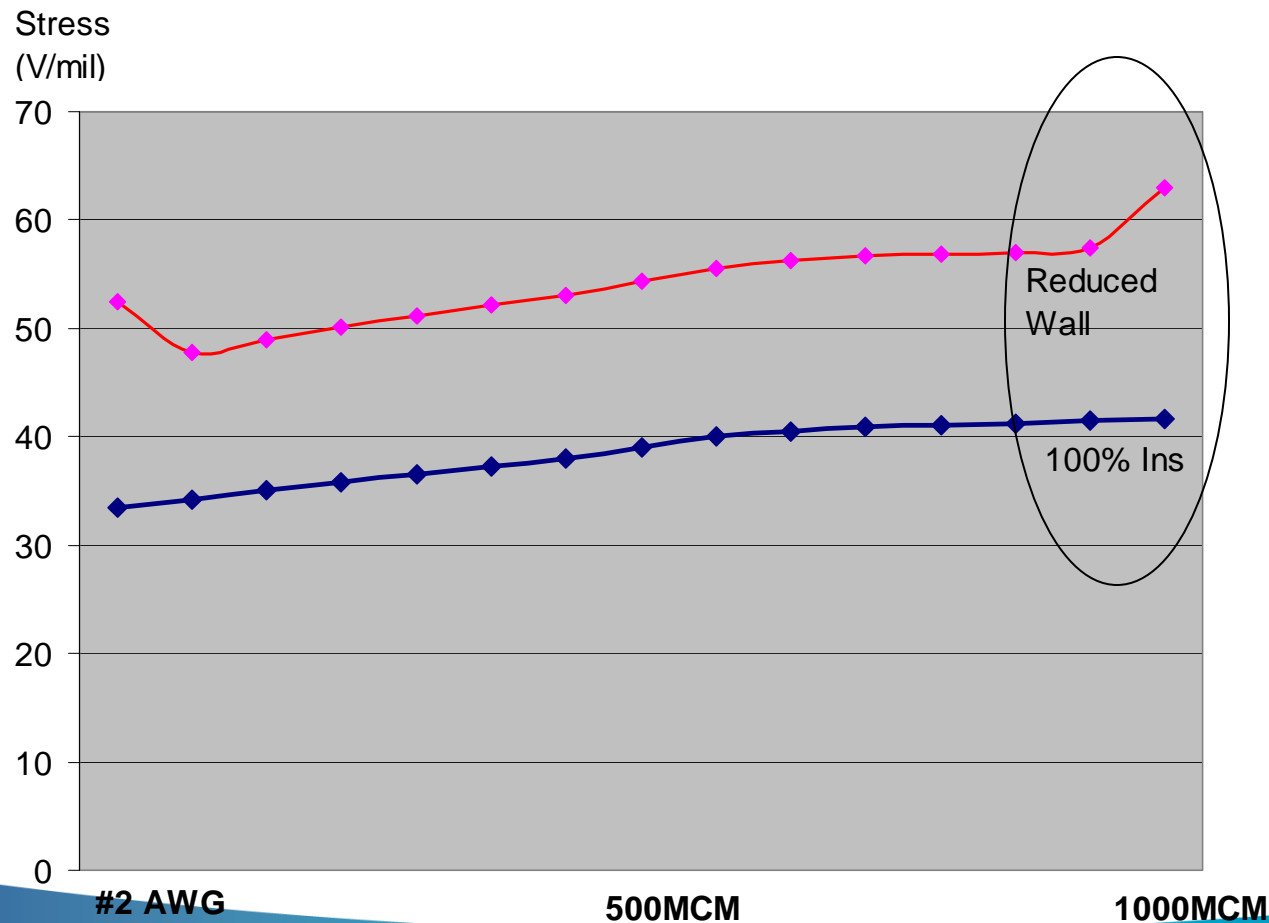
- Reducing the diameter of the cable may require a change in the accessories used to splice or terminate the cable
- All cable accessory use ranges are specified by insulation diameter (not conductor diameter)
- Conductor use ranges are provided as a reference and will need to be adjusted for each kit

Application Range – 15kV Coldshrink Joint

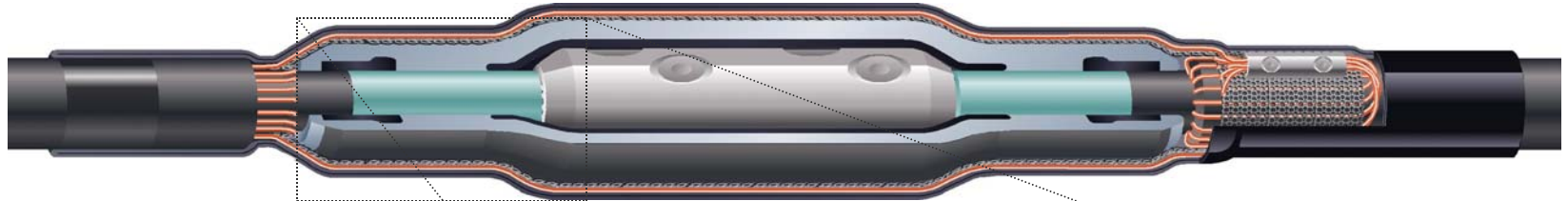
Kit Description	Insulation diameter range (mils)	Conductor range (100% ins)	Conductor range (reduced wall)
1	680-1190	#2-400	3/0-700
2	815-1410	2/0-750	250-1000
3	1270-1940	500-1250	750-1250

Electrical Stress in Reduced Wall 15kV Cable

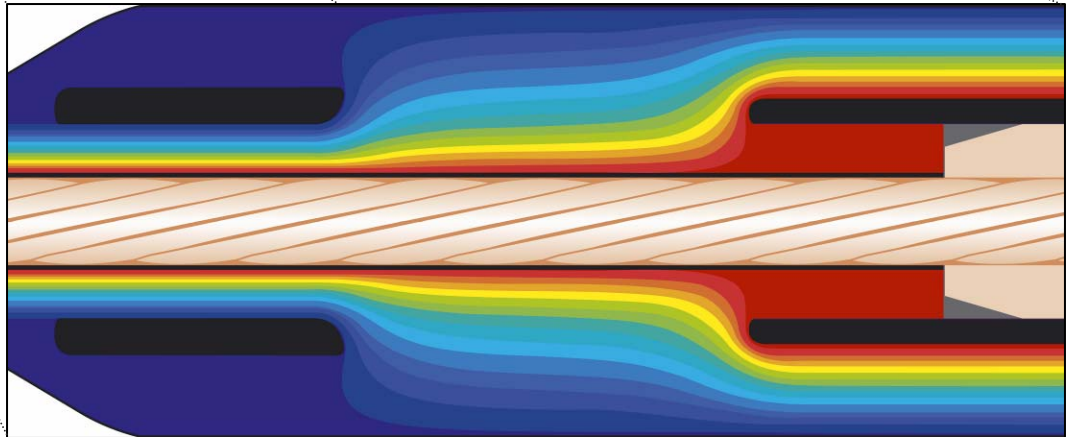
Reduced insulation thickness increases the stress at the insulation shield by approximately 50% on a 1000MCM cable



Electrical stress control

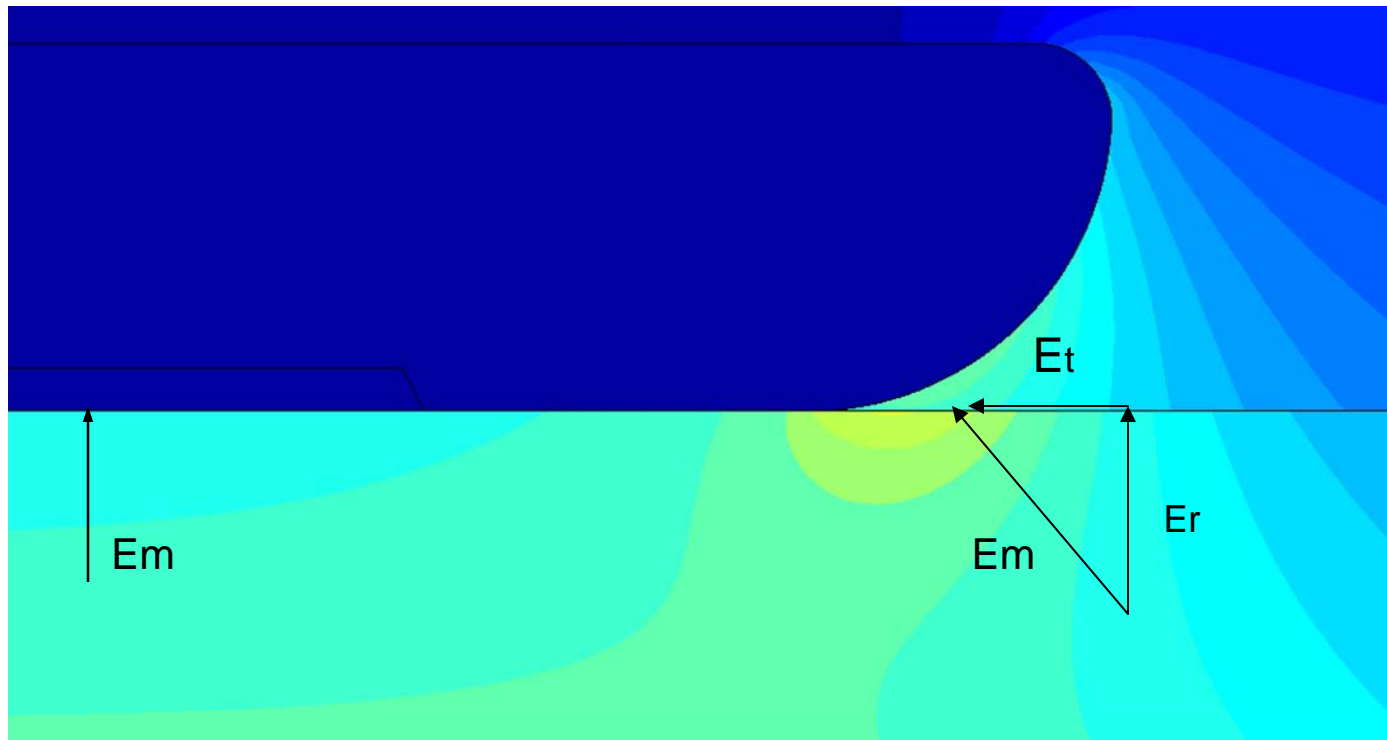


- The stress near the semicon cutback in the cable accessory will increase proportionately
- The stress over the faraday cage will not be affected



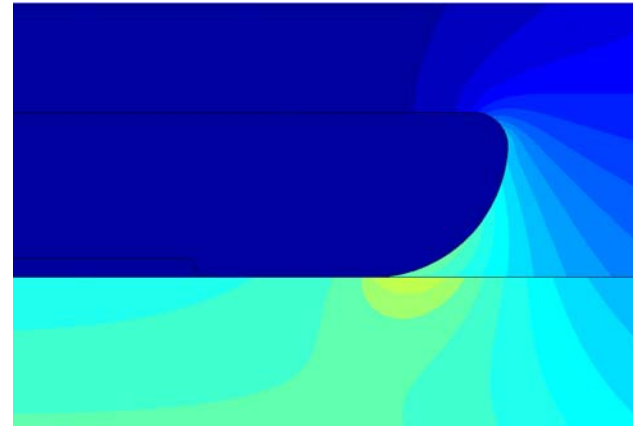
Interfacial Electrical Stress

- The tangential electric field along the interface will increase proportionately to the increased cable stress
- Interfacial dielectric strength is less than the bulk insulation
- Interfacial dielectric strength is a function of pressure



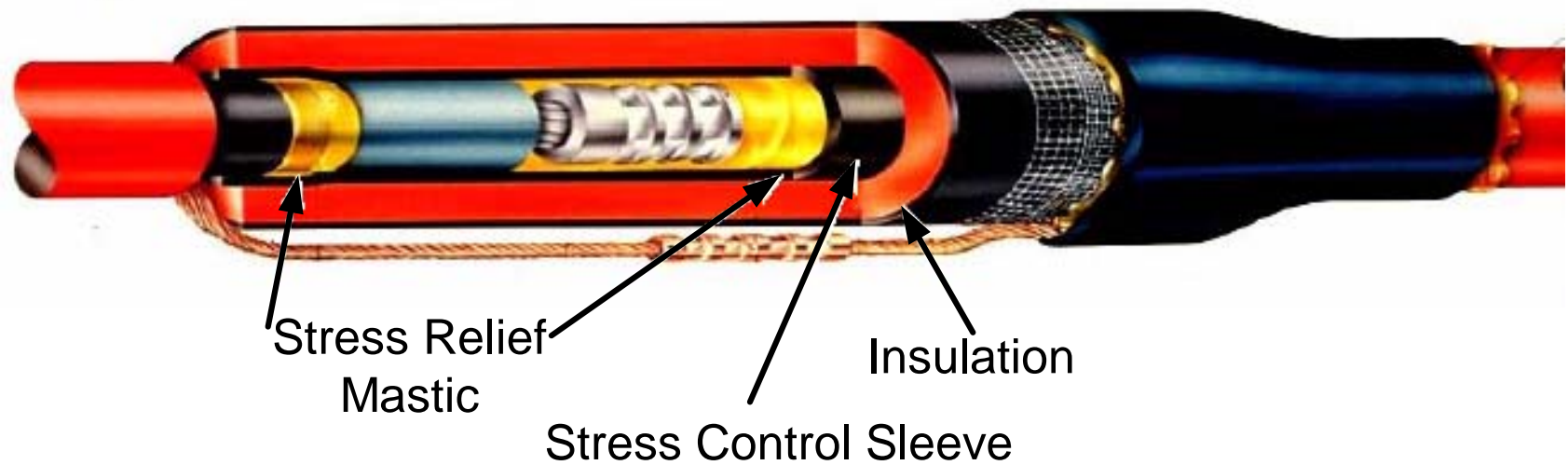
Electrical Stress on Interface

- Some cable accessories will handle the increased interfacial stress better than others depending on their design
- All designs should be tested on largest conductor cable in the minimum end of the use range to verify performance



Heatshrink

- Wide application range, conforms to substrate, tough and rugged, unlimited shelf life
- Refractive stress grading sleeves and mastics



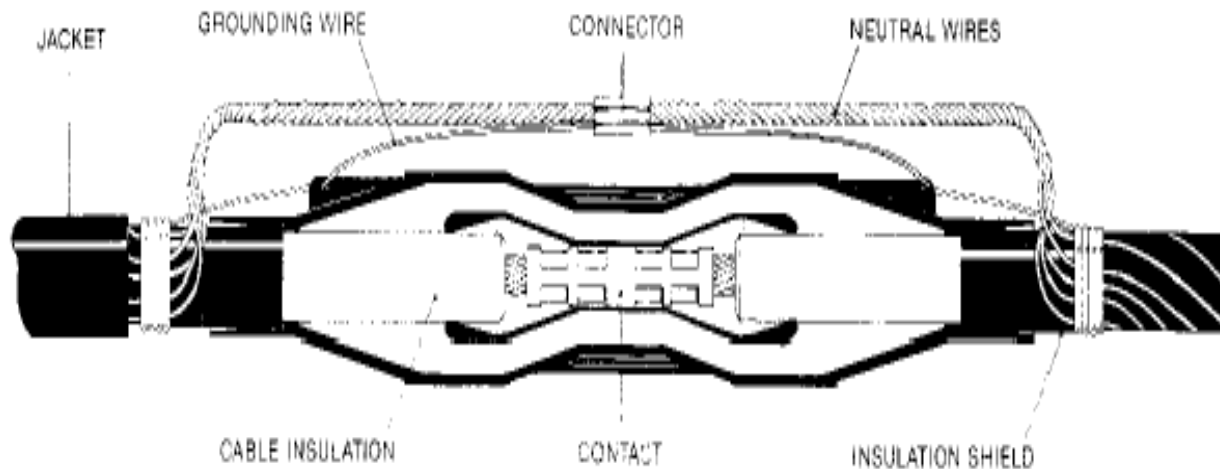
Coldshrink

- Wide application range, conforms to substrate, easy to install
- Geometric Stress Grading Faraday Cage and Stress Cones



Premold

- Narrow application range, easy to install, low cost
- Geometric Stress Grading Faraday Cage and Stress Cones



Summary

- Reducing the diameter of the cable may require a change in the accessories used to splice or terminate the cable
- Reducing the cable insulation thicknesses will increase the electric stress in the cable accessories
- The most critical area will be at the stress cones or stress control mastics at the semicon cutback
- The user should ask for data that verifies the performance of cable accessories operating at the higher voltages stresses associated with reduced wall cables