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Insulated Conductors  
Committee

Educational Program

“600 Volt

Underground Cable  
Standards”

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# Underground Standards

- ANSI/ICEA S-105-692 -  
“Standard For 600 Volt Single Layer  
Thermoset Insulated Utility  
Underground Distribution Cables”

# Underground Standards

- ANSI/ICEA S-81-570 -  
“Standard For 600 Volt Rated  
Cables Of Ruggedized Design For  
Direct Burial Installations As Single  
Conductors Or Assemblies Of  
Single Conductors”

# Underground Standards

- UL-854 -  
“UL Standard for Safety for Service-Entrance Cables, UL 854”  
ANSI Approved Standard  
UL Type USE-2 Cables

# Underground Standards

- Scope -  
600 Volts Phase-to-Phase  
480 Volts Phase-to-Ground (ICEA)
- Size  
8 AWG to 1000 kcmil

# Underground Standards

- Conductors - Aluminum 1350 and 8000 Series, and Copper.
- Stranded Conductors - All strand types listed in ASTM.  
(Con. Rd., Cpr, Cpt, Unilay Compressed, Combination Unilay, Cpt SIW, Cpr SIW)

# Underground Standards

- Insulation -  
692 - 90°C Thermoset  
570 - “Ruggedized” 75°C or 90°C  
UL-854 - 90°C Thermoset for  
type USE-2



# Underground Standards

- Insulation Wall Thickness -  
Minimum point requirements -  
ICEA.

250 - 500 kcmil - Wall thickness  
may be reduced.

# Underground Standards

- ICEA S-81-570 - Ruggedized Cable 90°C Insulation.  
Dual Layer or Single Layer Insulation systems.

# Underground Standards

- In-Process Requirements -
  - Conductor
  - Insulation
  - Assembled Cable
  - Print
  - Neutral Identification

# Underground Standards

- Voltage Test Requirements

Tank Test or Spark Test required.

Test voltage and soak times have changed in ICEA.

# Underground Standards

- Voltage Test Requirements

ICEA test voltages increased.

ICEA Soak Times.

Plexed Cable - 1/2 hr.

Singles and Parallel Cable - 1 hr.

# Underground Standards

- Qualification

Cable qualification

S-81-570 - Mechanical Abuse Test

Requirements - Abrasion,  
Scoring, Puncture, Crush,  
Sharp and Blunt Impact

# Underground Standards

- Recommended Bending Radii (ICEA)  
Single Conductors and Assemblies
- Minimum Drum Requirements (ICEA)  
Singles - 10 X  
Plex - 7.5 X  
NEMA WC-26

# Underground Standards

- Availability
- S-105-692 and S-81-570 - Issued as ICEA document. At NEMA for ANSI approval. Available at Global or ICEA.
- UL-854 available at Global or UL.