

Advanced Contamination Control

The Hendrix approach that maximizes insulation life and cable performance



What Hendrix Contamination Control Delivers

Without robust contamination control, premature aging of the cable insulation and early cable failures can occur. Even though today's cable resists the growth of water trees, minimizing or eliminating contamination in the cable insulation's materials will increase the probability of long service life for the cable.

The Hendrix Contamination Control Process

MATERIALS HANDLING: DELIVERY & STORAGE

The patented Hendrix insulation compound handling system eliminates potential sources of contamination at the extrusion system.

A sealed railcar serves as the transportation container for insulation compound between the compound manufacturer and Hendrix. A sealed Super Sack is the container for semi-conducting shield compounds. After delivery by the railroad, the railcar or Super Sack is positioned in a clean room facility located directly adjacent to the cable extrusion tower.

The only opening of the closed compound container and compound transfer system occurs when the two are coupled together in the Hendrix clean room.



MATERIALS HANDLING: MOVEMENT & EXTRUSION

A short length of stainless steel tubing connects the railcar and the stainless steel extruder hopper with Class 100 clean room conveying air moving the compound into the extruder.

The stainless steel extruder hoppers and true tri-head (triple) extruder complete the system. The true triple head ensures that the compound is never exposed to a non-controlled environment during the extrusion process.



A HENDRIX PATENTED PROCESS

Hendrix developed and patented this process to deliver the cleanest insulation in the industry. Because ambient contamination does not occur, the Hendrix clean room process eliminates the need to sample insulation batches after compounding.

INSULATION COMPOUND CONVEYING SYSTEM FEATURES

- Clean room and conveying air certification to FED-STD-209E (ISO 14644)
 - Railcar clean room, Class 10,000 maximum
 - Railcar conveying air, Class 100 maximum
 - Super Sack clean room, Class 100 maximum
 - Super Sack conveying air, Class 100 maximum
- Minimized conveying distance
- Stainless steel insulation compound conveying tube
- Stainless steel hoppers
- True triple head extrusion



WHY RELY ON HENDRIX FOR CONTAMINATION ELIMINATION

- Hendrix purchases the cleanest compound
- Random trickle sampling of compound ingredients ensures quality control
- The Hendrix closed compound handling system eliminates exposure to non-controlled environments
- Hendrix maintains quality audits for consistent control at all times

Why Contamination Control Is Important for Power Cable

The purpose of shielded cable insulation is to significantly reduce current flow to ground. For a 15kV cable, ground is located 0.175" or 0.220" from the operating voltage conductor. Because of the short distance between the conductor and ground, a cable can be considered a capacitor with the conductor as one plate and the grounded insulation shield as the other plate.

The insulation between the plates requires a low dielectric constant to minimize charging current. The lower dielectric constant reduces dielectric losses

and insulation wall thickness in the cable. In an ideal cable, there would be a completely uniform dielectric between the two plates of the capacitor.

Any foreign material that is not an intended ingredient of the compound formulation is a contaminant. Contaminants in the insulation compound can modify the electric field configuration of the cable, causing the tree resistance properties of the insulation material to work harder and some localized deterioration of the insulation to develop.