



ASAsoft® ArmorGalv® TDG

Advanced Corrosion Protection for
Light+weight High Voltage Composite Insulator Hardware

Applications: Transmission, Distribution, Railways, and Harsh Coastal Environments

Light+weight®

● What is ArmorGalv®?

ArmorGalv® is a Thermal Diffusion Galvanizing (TDG) process that applies a uniform, sacrificial zinc-iron alloy coating to steel hardware components through metallurgical vapour diffusion. Unlike hot-dip galvanizing or electroplating, ArmorGalv® TDG coats all surfaces uniformly regardless of geometry, including socket cavities and threaded sections that conventional processes typically leave unprotected.

- The coating application includes internal bores, socket cavities, and threaded sections that conventional processes typically leave unprotected

● The TDG Advantage

ArmorGalv® TDG applies a uniform zinc-iron alloy coating to every internal and external surface of insulator hardware, eliminating the hidden corrosion pathways that compromise mechanical integrity and shorten service life. In composite insulators, the greatest corrosion risk is unperceived: moisture entering unprotected end fitting bores and crimp zones drives degradation, arcing, and ultimately ignition risk.



Figure 1. Comparison of Internal Corrosion Protection in Deadend/Suspension Insulator Clevis Fittings: Conventional HDG vs ArmorGalv® TDG



Figure 2. TDG-Coated Station Post End Fitting after ANSI/NEMA C29.11 Tracking Wheel Testing and CSA C156.2 Steep-Front Impulse and Power Frequency Voltage Testing

● Insulator Hardware Applications

Composite insulator end fittings must be protected against corrosion on both their internal and external surfaces. The internal cavity, where the FRP rod is crimped and sealed, is particularly crucial. Failure of the end fitting seal and subsequent moisture penetration is the most common cause of stress corrosion cracking and catastrophic brittle fracture of the rod.¹

While external corrosion protection is standard practice, the internal socket cavity and threaded connection points are frequently left unprotected by conventional coatings such as HDG. ArmorGalv® TDG addresses both surfaces in a single process, applying a uniform zinc-iron alloy coating to the full internal and external geometry of the end fitting to eliminate the corrosion pathways at the most vulnerable interface in the assembly and significantly extending service life in aggressive environments.²

References:

¹ IEEE Task Force Report: Brittle Fracture in Nonceramic Insulators. researchgate.net/publication/3274284

² IEEE: Failure Analyses of Nonceramic Insulators | Brittle Fracture Characteristics. ieeexplore.ieee.org/document/1437604

● **Coating Performance Comparison & Summary**

	ArmorGalv [®] TDG	Hot-Dip Galvanize (HDG)
Salt Spray Resistance (ASTM B117)	Certified to 3000 hrs	Not certified
Hydrogen Embrittlement	None; process guaranteed free	Not addressed; risk varies by process conditions
Coating Thickness Uniformity	Consistent across complex end fitting geometry, absent of drips and dross	Variable; drips and dross occur on complex fitting profiles
Environmental Impact (Solid/Liquid Waste Reduction)	Near zero liquid & solid waste; EPA MVP ² Award 2006	Acid pickling required in preparation

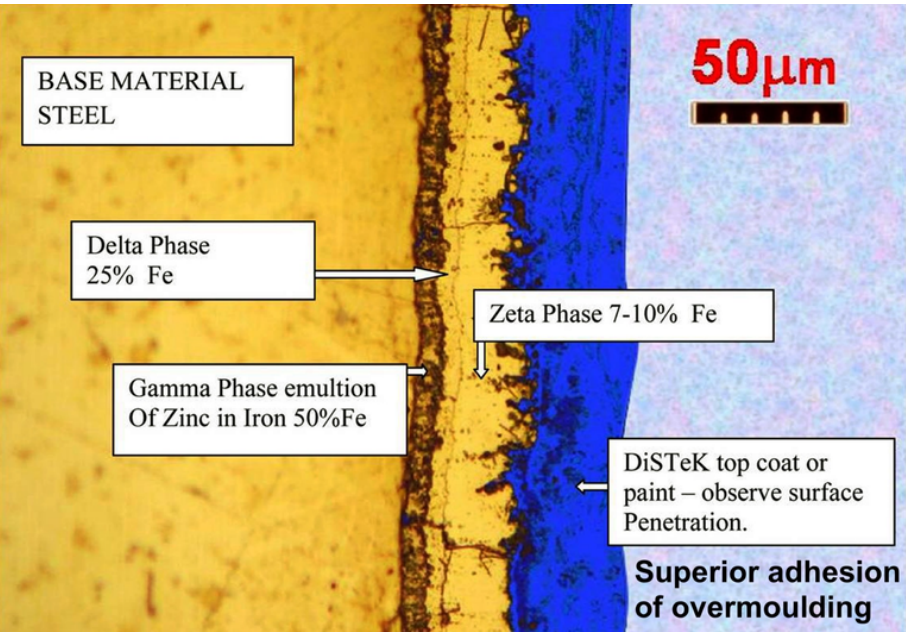


Scan QR Code

Scan to witness a power arc event on a TDG Station Post Insulator (SPT28).

*DiSTeK N.A. LLC, TDG Technical Presentation, U.S. Army Corrosion Summit, 2009. apps.dtic.mil/sti/citations/ADA509651

● **Metallurgical Cross Sections Compositions**



Each successive phase layer of the TDG coating is progressively corrosion-resistant and harder (Hardness measured in HV) than the last; unlike HDG’s thick outer ETA layer (100% Zinc), which is soft and the first to corrode.

Figure 3. Cross-Sectional Metallurgical Composition of Thermally Diffused Zinc Coating

01 Environmentally Friendly

Near zero-waste, non-toxic process | ArmorGalv® recipient of EPA MVP² Award 2006



02 Anti-Galling

Unlike HDG, TDG's low-friction surface prevents thread seizing on end fitting connections during installation and in service

03 Superior Corrosion & Abrasion Resistance

HDG exhibits rust after 5000 hours of ASTM B117 salt spray exposure. TDG is fully protected to 5000 hours with 10x resilience

04 Sacrificial Galvanic Protection

Actively corrodes in place of the steel substrate, outlasting HDG once its outer zinc layer depletes

05 Excellent Top-Coat Adhesion

Micro-rough surface provides superior bonding for duplex coating systems on end fitting hardware in high-pollution and coastal environments



 Visit Our Site!



Standards & Approvals

ASTM A1059/A1059M
ISO 17668
BS EN 13811
NACE



Protected by 4 international patent filings

INTERNATIONAL HEADQUARTERS
ASAsoft® (Canada) Inc.
179-2945 Jacklin Road, Box 221,
VICTORIA, B.C. V9B 6J9 CANADA

UNITED STATES
Kortick Manufacturing
2261 Carion Ct,
PITTSBURG, CA94565 USA

JAPAN
Future Electronics CO.,LTD.
8F#B OTOMO BLDG., 1-5-18 OTUSUKA,
BUNKYU-KU, TOKYO 112-0012

CONTACT
Phone: 888-316-6562, Ext 104
Fax: 1-250-999-2198
Email: info@lightweightinsulators.com
www.lightweightinsulators.com

