

OPGW optical cable discharge corrosion



Article Overview

Discharge corrosion in OPGW cables occurs primarily due to galvanic interactions between aluminum and stainless steel components, exacerbated by environmental electrolytes and lightning-induced currents.

Causes of Discharge Corrosion

OPGW (Optical Ground Wire) cables combine aluminum and steel layers to provide both electrical conductivity and mechanical strength, with optical fibers housed in a central tube for communication purposes . When stainless steel and aluminum are in direct contact, especially in outdoor environments with salt, industrial pollutants, or moisture, a galvanic reaction can occur. The aluminum acts as the anode and corrodes preferentially, while the stainless steel acts as the cathode . This process is accelerated in areas with high humidity, coastal exposure, or industrial contamination. Electrical discharges, such as lightning strikes or induced currents, can further exacerbate corrosion. High-energy impulses can damage protective coatings, melt aluminum strands, or create localized heating, which accelerates the breakdown of the aluminum layer and promotes strand breakage .

Material and Design Considerations

To mitigate discharge corrosion, OPGW cables are designed with:

- Zinc or aluminum coatings on steel wires to resist oxidation .
- Aluminum-clad steel (ACS) or all-aluminum (AA) outer layers to balance conductivity, mechanical strength, and corrosion resistance

Article Content

Sep 09, 2025

Melting and breaking characteristics of strands of high-strength and ...

J-Power Transmission Network Co., Ltd. has developed high strength and high-corrosion-resistant OPGW for long

Apr 11, 2026

(PDF) Influence of the Discharge Pulse Width in the Current ...

The objective of this paper is to show the influence of the duration of a lightning pulse on OPGW cables, using the

Oct 18, 2025

OPGW Partial Discharge Monitoring Based on Distributed Fiber Optic ...

This research focuses on the application of the Distributed Acoustic Sensing (DAS) system in the field of partial

Apr 16, 2026

Optical Fiber Composite Overhead Ground Wire (OPGW)

Two or three stainless steel optical tubes are helically stranded in the inner layer of a multiple-layer cable. The multi loose tube type

Jan 22, 2026

What Type of OPGW Cable is Best For You?

What Type of OPGW Cable is Best For You? For more than 30 years, AFL has been designing and manufacturing

Nov 18, 2025

OPGW Fiber Optical Cable Manufacturer High Quality

OPGW cable is usually custom-designed to best match the optical, electrical, mechanical, quality, and cost requirements of each

Mar 30, 2026

Melting and Breaking Characteristics of Strands of High-strength and ...

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May 22, 2026

Optical ground wire

An optical ground wire (also known as an OPGW or, in the IEEE standard, an optical fiber composite overhead ground wire) is a type

Jan 11, 2026

What is Optical Ground Wire (OPGW)?

Optical fiber break out cable and indoor distribution optical fiber cable will be used for network vision enhancement

Oct 02, 2025

(PDF) Extreme Testing of Guard Cables with Fiber Optics: A Case ...

Context: Optical fiber ground wires (OPGWs) sometimes melt and rupture when exposed to extreme conditions, such

Aug 07, 2025

IEC 60794-4-10:2014

Optical fibre cables - Part 4-10: Family specification - Optical ground wires (OPGW) along electrical power lines.

Aug 12, 2025

Melting and Breaking Characteristics of OPGW Strands by Lightning

Melting and breaking characteristics of strands of high-strength and high-corrosion-resistant OPGW due to DC arc

Aug 17, 2025

Melting and breaking characteristics of strands of high-strength and ...

Metal strands of composite fiber-optic ground wire (OPGW) are sometimes melted and broken by high-energy lightning

Apr 26, 2026

The Impact of Optical Ground Wire (OPGW) In OSP Networks

Understanding Optical Ground Wire (OPGW) Optical ground wire (OPGW) is a composite cable that revolutionizes

Apr 11, 2026

FIBRE OPTIC SYSTEMS FOR OHTL

Introducing fibre optic systems for OHTL Overhead optical fibre cable systems have become a key factor in telecommunications

Aug 03, 2025

Claims Relating To Optical Ground Wire Corrosion

Facts: NTPC initiated arbitration against ABB for premature corrosion of OPGW in thermal power transmission lines.

Mar 12, 2026

Optical Ground Wire and Shield Wire Corrosion Due to Bird Mutes

To understand the corrosion mechanisms of shield wire and OPGW materials when exposed to bird mutes, evaluate if a specific

May 14, 2026

Research on intelligent identification of potential grounding hazards ...

Especially in high-voltage substations, OPGW cables are widely distributed, and the hidden defects of the grounding

Oct 14, 2025

Breaking Characteristics of 60 mm² OPGW Strands due to DC Arc ...

Metal strands of composite fiber-optic ground wire (OPGW) are sometimes melted and broken by high-energy lightning strikes. Direct

Jan 25, 2026

Hardware, fittings and OPGW

These rings are designed to be durable, corrosion-resistant and electrically efficient. The toroidal shape ensures uniform distribution

Jan 06, 2026

OPGW WRAP ADSS Fiber Optic Cables

Fiber optic cables installed above ground are not subject to "dig-ups" which is the biggest cause of cable damage.

Apr 17, 2026

Incab America LLC: Fiber Optic Cable Manufacturers & Company

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

May 15, 2026

Evaluating Various Monitoring Techniques for OPGW Cable Health

The operating principles, measurement capabilities, advantages and limitations of each method are discussed. Through this brief

Aug 20, 2025

T& D "24 Tutorial: Proficiency in Optical Groundwire (OPGW) Design

This tutorial will cover: The three basic design types of OPGW used, the advantages and disadvantages of each, and

Jul 19, 2026

LS OPGW System Overview and Specifications | PDF | Optical Fiber ...

This document appears to be describing LS Cable & System's Optical Ground Wire (OPGW) system. It discusses their aluminum

Sep 26, 2025

OPGW Partial Discharge Monitoring Based on Distributed Fiber Optic ...

Optical Fiber Composite Overhead Ground Wires (OPGW) serves as critical components in power transmission

Apr 03, 2026

Calculation of melting/breaking of GW and OPGW strands

Abstract Some metal strands of ground wire (GW) and composite fiber-optic ground wire (OPGW) are sometimes

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