



GR-771-CORE vs IP68

WHY THE DIFFERENCE MATTERS WHEN SPECIFYING FIBER OPTIC SPLICE CLOSURES

EVALUATING FIBER OPTIC SPLICE CLOSURES

Fiber optic splice closures play a critical role in protecting the integrity of outside plant (OSP) communication networks. These closures safeguard delicate fiber splices from environmental exposure, mechanical stress, and long-term degradation across aerial, buried, and underground installations.

When evaluating splice closures, two specifications frequently appear in product literature: **IP68** and **Telcordia GR-771-CORE**. While these designations are sometimes presented as equivalent indicators of product durability, they represent fundamentally different types of testing.

- **IP68** is an ingress protection rating that verifies a closure's resistance to dust and water immersion.
- In contrast, **GR-771-CORE** is a comprehensive telecommunications industry standard that evaluates environmental durability, mechanical integrity, and optical performance across a wide range of real-world conditions.

Understanding the difference between these standards is essential for network operators, utilities, broadband providers, and contractors responsible for building reliable fiber infrastructure.

Closures designed and tested to GR-771-CORE provide a significantly higher level of confidence in long-term network performance.



THE ROLE OF SPLICE CLOSURES IN FIBER NETWORKS

Fiber optic splice closures are designed to protect the environmental and mechanical integrity of fiber cables after splicing occurs within the network.

They serve several essential functions:

- Protect fiber splices from moisture, dust, and contaminants
- Maintain fiber bend radius and mechanical stability
- Provide strain relief for cable entries
- Support long-term network reliability in outdoor environments

These closures are typically installed in demanding environments such as:

- Aerial deployments including Strand & Lash and ADSS
- Underground vaults and handholes
- Direct buried installations
- Pedestals and cabinets
- Pole-mounted distribution points

Because these installations may remain in service for decades, closures must withstand extreme environmental and mechanical stresses throughout the life of the network. Standards and testing protocols exist to verify whether closures can reliably perform under these conditions.

UNDERSTANDING IP68

The **IP (Ingress Protection) rating system**, defined by **IEC 60529**, classifies how well a closure prevents intrusion by solids and liquids. Ratings are formed by combining the first and second numerals from the table below.

IP Ratings Guide

SOLID FOREIGN OBJECTS			WATER	
First Numeral	Protection	Second Numeral	Protection	Explanation
0	No Protection	0	No Protection	No Protection
1	Protected against solid foreign objects of 50 mm Ø and greater	1	Protected against vertically falling water drops	Vertically falling drops shall have no harmful effects
2	Protected against solid foreign objects of 12.5 mm Ø and greater	2	Protected against vertically falling water drops when tilted ≤15°	Vertically falling drops shall have no harmful effects when the enclosure is tilted at any angle up to 15° on either side of the vertical
3	Protected against solid foreign objects of 2.5 mm Ø and greater	3	Protected against spraying water	Water sprayed at an angle ≤60° on either side of the vertical shall have no harmful effects
4	Protected against solid foreign objects of 1.0 mm Ø and greater	4	Protected against splashing water	Water splashed against the enclosure from any direction shall have no harmful effects
5	Dust-Protected	5	Protected against water jets	Water projected in jets against the enclosure from any direction shall have no harmful effects
6	Dust-Tight	6	Protected against powerful water jets	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects
An IP68 rating indicates: 6 Complete protection against dust ingress 8 Protection against continuous immersion in water (at a depth >1m for at least 30 minutes)		7	Protected against the effects of temporary immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is temporarily immersed in water under standardized conditions of pressure and time
		8	Protected against the effects of continuous immersion in water	Ingress of water in quantities causing harmful effects shall not be possible when the enclosure is continuously immersed in water under conditions which shall be agreed between manufacturer and user, but which are more severe than for Numeral 7
		9	Protected against high pressure and temperature water jets	Water projected at high pressure and high temperature against the enclosure from any direction shall not have harmful effects

Products tested to IP68 demonstrate that their closure seals can prevent dust penetration and withstand immersion under specified conditions. **This rating confirms the closure's ability to resist ingress of environmental contaminants.**

However, IP ratings are intentionally limited in scope. They evaluate **only the sealing performance of the closure** and do not address the broader range of conditions encountered in telecommunications outside plant environments.

LIMITATIONS OF IP RATINGS FOR TELECOM APPLICATIONS

While ingress protection is important, fiber optic closures must perform reliably under a much wider set of conditions. IP68 testing **does not evaluate** factors such as:

- Thermal expansion and contraction from temperature swings
- Freeze-thaw cycling
- UV exposure and long-term material aging
- Mechanical compression, impact, and vibration
- Cable tensile loading and strain relief performance
- Long-term sealing performance after re-entry
- Optical performance during environmental stress

Because these conditions are common in outside plant deployments, telecom-specific standards were developed to validate closure performance beyond ingress protection, including various water resistance standards pending the fiber closure type.

WHAT IS GR-771-CORE?

Partly driven by contributions from PLP's extensive research and testing, **Telcordia® GR-771-CORE** is the telecommunications industry's generic requirements standard for fiber optic splice closures.

Unlike IP ratings, GR-771 evaluates **overall closure performance across environmental, mechanical, and functional conditions typical of outside plant networks**. The standard defines testing procedures designed to replicate real-world operating environments and long-term service conditions. Closures that meet GR-771-CORE must demonstrate reliable performance through a broad series of tests.

KEY GR-771 TEST CATEGORIES



Environmental Durability

GR-771 closures are evaluated under simulated environmental stresses such as:

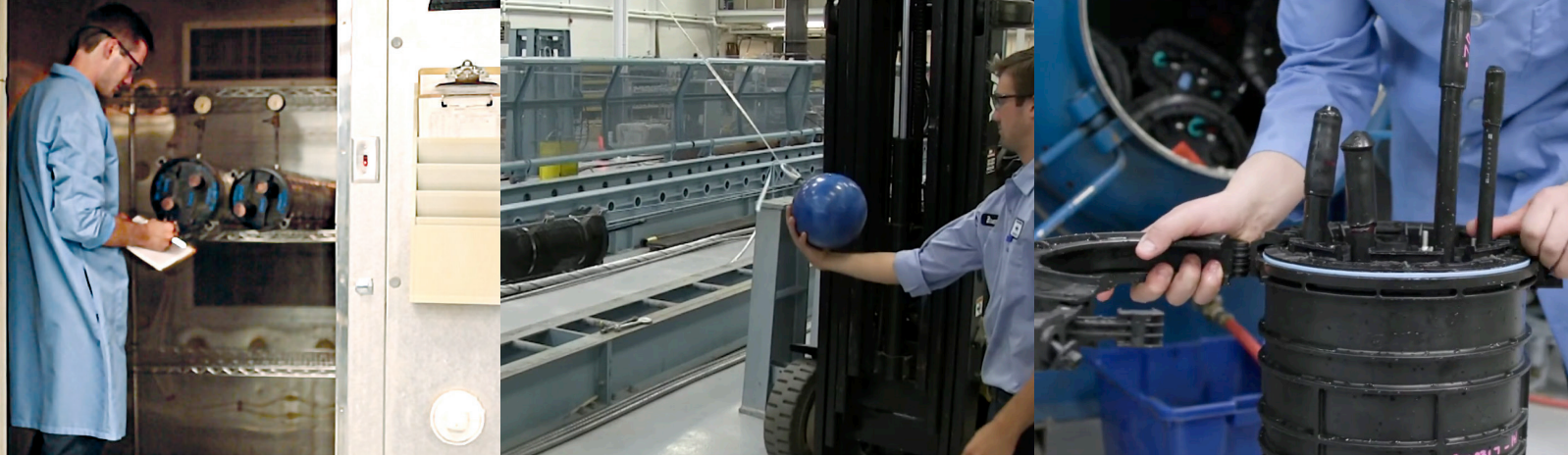
- Thermal cycling across extreme temperatures
- Freeze-thaw conditions
- High humidity exposure
- UV Radiation
- Water spray and immersion

These tests ensure closures can maintain sealing integrity and material stability over long service lifetimes.

Water Environment Testing

Deployment Environment	Water Environment & Duration
Buried, Underground	20-ft Waterhead, 7 days
Manhole	20-ft Waterhead, 7 days
Handhole	10-ft Waterhead, 7 days
Outdoor Wall Mount	Flood Resistant Rain Resistant 10-ft Waterhead, 7 days Wind-Driven Rain, 30 minutes per side
Aerial Pole and Strand	Wind-Driven Rain, 30 minutes per side
Indoor Wall Mount	Water Spray, 30 minutes per side





Mechanical Integrity

Closures must also demonstrate resistance to mechanical stress, including:

- Compression forces
- Vibration and transportation shock
- Cable tensile loading
- Cable bending stress
- Impact resistance

These conditions simulate real-world stresses from wind loading, traffic vibration, and installation forces.



Material Resistance

GR-771 closures have their material durability evaluated through exposure to:

- Salt spray environments
- Dust and particulate contamination
- Chemical exposure

These tests help ensure closure materials remain stable in harsh environments.



Functional and Optical Performance

Perhaps most importantly, GR-771 testing verifies that closures maintain optical functional integrity during and after environmental stress testing. This includes:

- Monitoring fiber attenuation during testing
- Verifying cable sealing performance
- Ensuring proper fiber management and strain relief
- Confirming re-entry capability without performance degradation

GR-771-CORE VS IP68: KEY DIFFERENCES

ATTRIBUTE	IP68	GR-771-CORE
Governing Standard	IEC 60529	Telcordia®
Scope	Ingress protection only	Full telecom closure performance
Dust Protection	✓	✓
Water Immersion	✓	✓
Thermal Cycling	✗	✓
Freeze-Thaw Testing	✗	✓
UV Resistance	✗	✓
Mechanical Stress Testing	✗	✓
Cable Strain Testing	✗	✓
Vibration Testing	✗	✓
Optical Performance Validation	✗	✓
IN SIMPLE TERMS:	<u>IP68</u> verifies sealing performance. <u>GR-771</u> verifies long-term telecom reliability.	

WHY THIS MATTERS FOR NETWORK OPERATORS



Long-Term Network Reliability

Fiber networks are typically designed with 20–30 year service lifecycles. Failures in splice closures can lead to fiber attenuation, signal loss, and service disruptions. Closures validated through GR-771 testing provide confidence that they can withstand environmental stress over the life of the network.



Reduced Maintenance Costs

Accessing splice closures for repairs often requires significant labor and operational disruption. Common service scenarios include:

- Opening underground handholes
- Traffic control for roadside vaults
- Accessing aerial locations
- Excavation of buried infrastructure
- Truck rolls

Closures engineered to telecom durability standards help reduce the likelihood of these costly interventions.



Resilience in Harsh Environments

Outside plant infrastructure must perform during extreme conditions, including:

- Flooding
- Temperature extremes
- Severe storms
- Mechanical vibration

GR-771 testing simulates these scenarios to ensure closures continue protecting the network under demanding conditions.



INDUSTRY STANDARDS MATTER MORE THAN MARKETING CLAIMS

In the telecommunications industry, standards such as GR-771 exist to provide objective validation of product performance. While ingress protection ratings can demonstrate the sealing capability of closures, they do not fully reflect the range of stresses experienced by fiber infrastructure.

For this reason, many telecom network operators and utilities specify GR-771 compliance when evaluating splice closures for deployment.

PLP'S COMMITMENT TO FIBER NETWORK RELIABILITY

For over 30 years, PLP has engineered fiber optic connectivity solutions that help network operators build reliable critical infrastructure.

PLP's comprehensive line of COYOTE® Fiber Optic Closures, from small-scale to high-density options, is designed with the real-world challenges of outside plant networks in mind, combining robust environmental sealing with advanced fiber management and long-term durability.

Our engineering and testing processes are aligned with industry standards to ensure that our solutions meet the demanding requirements of modern broadband and telecommunications networks. Our products are tested from ideation through post-production to determine how they perform in real-time, to maintain the highest quality standards.

As global demand for fiber connectivity continues to expand, choosing components designed for long-term performance remains essential to building resilient, future-ready infrastructure.

CONCLUSION

IP68 and GR-771-CORE are often referenced together when evaluating fiber optic splice closures, but they represent very different levels of validation.

- IP68 confirms a closure's resistance to dust and water intrusion.
- GR-771-CORE verifies that a closure can withstand the full range of environmental, mechanical, and operational stresses experienced in telecommunications outside plant networks.

For network operators building infrastructure designed to last decades, closures validated to GR-771-CORE provide a far more comprehensive indicator of long-term reliability.

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