

**CORROSION**

STEEL GOING STRONG

# Propeller Shaft Grounding

Protection against spark erosion



IN DEPTH  
Maritime



## PSG: 3 questions answered

1. Spark erosion

2. How does it work?

3. Power

4. Lifetime



# Propeller Shaft Grounding

3 questions answered

## What is it?

The Propeller Shaft Grounding (PSG) system is installed on propeller shafts to insure a path of low resistance.

## Why do you need it?

To protect shaft and gearbox bearings from spark erosion created by the difference in potential caused by cathodic protection systems.

## Why CORROSION?

We offer high silver composition brushes and include the PSG system within the Impressed Current Cathodic Protection (ICCP) system alarm and log features, which means the functioning can be closely monitored.

## 1. Spark erosion

A costly and time-consuming problem

**The change in potential created by cathodic protection systems causes spark erosion, damaging bearings of propeller shafts and engines if shafts are not grounded. CORROSION's Propeller Shaft Grounding system provides sufficient grounding and functions as a measurement tool to check the functioning of the system.**

When the shaft rotates, the resistance in the bearings is variable, and can change from very low to very high for a split second. If the resistance is low, electrical arcing occurs, with the current 'jumping' onto the bearings and flowing to the hull of the vessel (ground). This factor causes spark erosion and damages the bearings.

To stop arcing occurring, and therefore prevent spark erosion, it is best practice to install a propeller shaft grounding system as an integral component of a vessel's cathodic protection system.

Providing the installation steps are correctly followed, the shaft grounding system provides a constant low resistance path to the hull of the vessel. This grounds the propeller shaft, ensuring that the current flows through the shaft grounding system instead of through the bearings.



Protecting your precious equipment  
and properties from fouling and  
corrosion is our soul objective.



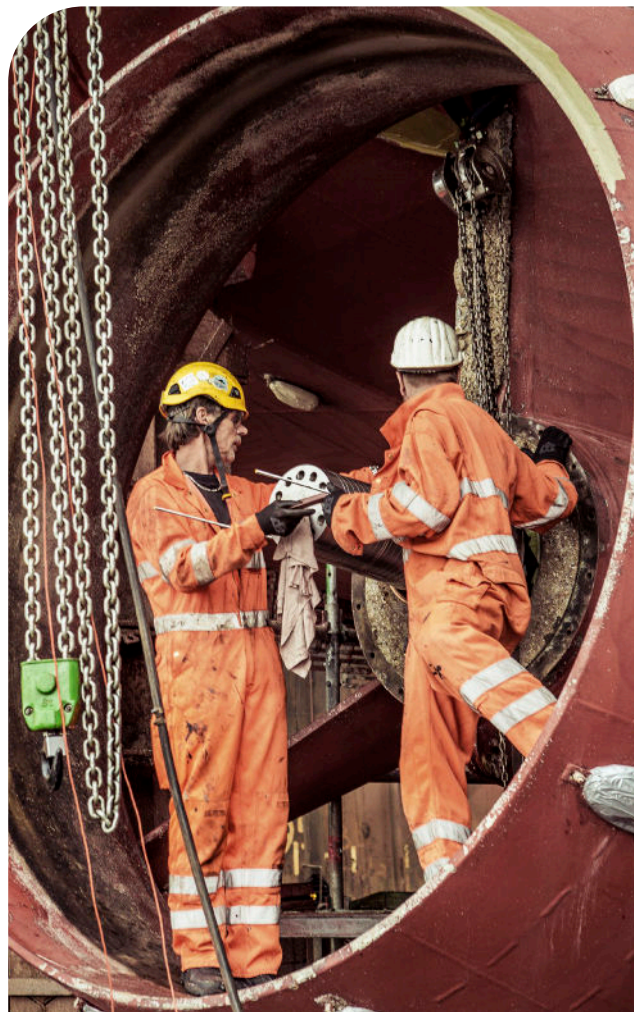


## 2. How does it work?

Shaft grounding systems can be used in conjunction with both sacrificial anode and impressed current systems. Based on our experience, the effects of arcing are minimized when the potential across the shaft/hull interface is less than 50 mV.

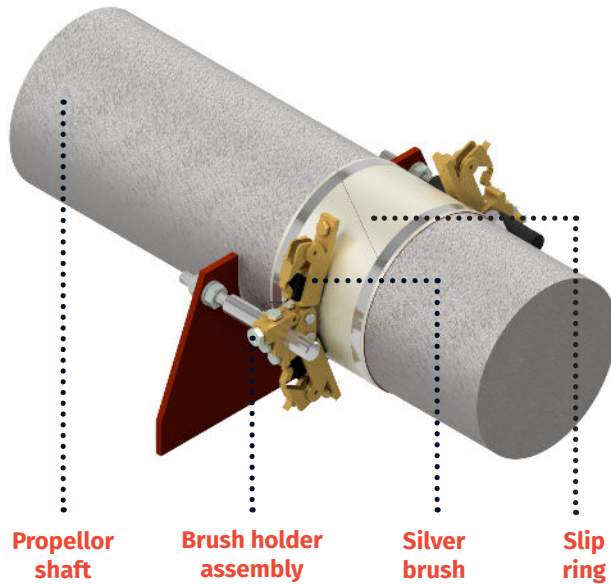
CORROSION's PSG system consists of a slip ring mounted around the propeller shaft. The two brush holders house three brushes: one for monitoring; and two for grounding the propeller to the hull of the vessel.

While various combinations of slip ring and carbon brush materials are available, experience shows that an effective and sustained low resistance path can only be provided by high silver composition brushes – meaning a minimum 80% silver and 20% graphite – running on a silver track. Our system is designed for easy installation by qualified technical personnel.



### 3. Power

The ICCP power unit is equipped with an internal monitoring system that provides a continuous read-out of the shaft connection, and therefore the functioning of the shaft grounding unit. This gives a warning if it reads a value in excess of 50 mV or higher.



We are able to supply PSG systems in many forms, whether that be integrated into an ICCP system, with an additional local read-out, or as a standalone system.

Provided that the system is operating normally, the power unit or mV read-out unit should display a constant shaft potential no higher than 50 mV. A reading in excess of this value or a fluctuating value indicates that the PSG unit is not functioning correctly, and maintenance is required.


## 4. Lifetime

Under normal circumstances, a correctly fitted slip ring and associated brush gear can be expected to perform for many years. Under such conditions, the brush life varies from 4 to 12 months, depending on the vessels trading/operational pattern. As this system has moving parts that are subjected to wear, this requires frequent visual inspection and the use of spare parts. Several other variables that influence the lifetime of the brushes are:

- » Shaft diameter
- » Shaft speed
- » Shaft rotation time
- » Shaft contamination





A full-page photograph of two male workers in an industrial setting, likely a shipyard. They are wearing bright orange high-visibility jumpsuits with reflective silver stripes, white hard hats, safety glasses, and black gloves. They are standing on a wet, dark concrete floor, looking down at a set of white papers held by the worker on the left. In the background, the large, dark red hull of a ship is visible, along with various industrial structures, scaffolding, and equipment. The scene is overcast and appears to be outdoors.

Our customers demand the **highest levels of service**, professionalism and expertise. And that's exactly what we deliver.



With offices and agents in over 30 countries around the world, it doesn't matter where you are or what you want to know, our specialists are already ready to help.

# About CORROSION

**CORROSION has been in the business of protecting offshore wind farms, vessels and onshore applications since 1993. From our humble beginnings in the small town of Moerkapelle in the Netherlands, we've grown into an internationally recognized leader in creative, sustainable, state-of-the-art solutions in corrosion and cathodic protection.**

Our highly sophisticated ICCP and ICAF systems are utilized by companies large and small around the world, protecting their valuable assets and equipment in even the toughest and most demanding conditions.

We're proud of the quality of the products we offer and the level of service we provide. Excellence is born of experience and expertise, and our unique research laboratory at our global headquarters in Moerkapelle is the beating heart of our company. It's where we test and develop new products and services, enabling us to lead the way in creating innovative anti-fouling and corrosion solutions.

Over the last three decades, we've expanded not just in terms of what we do, becoming a major global player in anti-fouling and maritime protection, but also geographically, with successful subsidiaries everywhere from Germany and France, to China and Vietnam.





# CORROSION



**CORROSION.NL**

## Contact us

We hope that this in-depth guide has been of interest to you. We would be very happy to answer any questions you may have or work with you to see whether our PSG meets your specific needs.

Check out our website [corrosion.nl](https://corrosion.nl) for more information. You can also reach us by telephone at: +31 (0) 79 5931295.

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