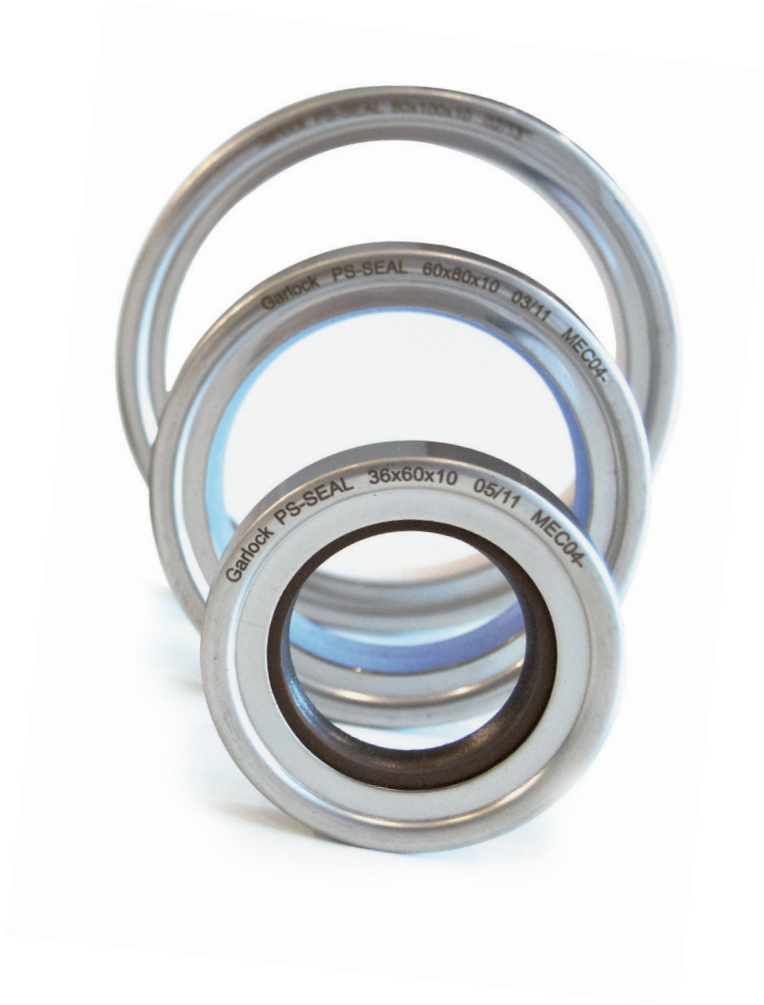


# Garlock Technical Statement

ATEX for PS-SEAL®



## General Statement

In Directive **94/9/EC of the European Parliament and the Council of 23 March 1994 on the harmonization of the laws of the member states concerning equipment and protective systems intended for use in potentially explosive atmospheres**, Chapter 1 (Scope, placing on the market and freedom of movement), Article 1 defines the equipment, protective systems, safety devices, controlling devices and regulating devices that will in future require certification in accordance with the ATEX Directive in order to comply with the provisions of Directive 94/9/EC.

From Chapter 1, Article 1(3c) of Directive 94/9/EC, it is evident that PS-SEAL® by Garlock is a „component“. The policy document of the ESA (European Sealing Association e.V.) of May 2012 clearly states that components cannot be certified independently.

The third paragraph in Chapter A states: „Because machinery elements are not defined within ATEX Directive 94/9/EC **they cannot be supplied with a Declaration of Conformity**“.

For mechanical seals, the ATEX certificate is linked to the following three ignition sources:

- A) an ignition spark arising from the discharge spark after prior electrostatic charging,
- B) an ignition spark arising from mechanical contact,
- C) an ignition arising from overheating occurring as the result of exposure to excess temperature, caused by friction between the seal and the sealing surface.

In the following section, GARLOCK will assess the ignition sources A - C.

# Assessment of Ignition Sources

## **A) Ignition sparks arising from the discharge spark after prior electrostatic charging**

At the request of Garlock GmbH (in September 2001), BBG Prüf- und Zertifizier GmbH EXAM compiled an „Expert Opinion on the electrostatic ignition hazards of PS-SEAL® sealing systems when used in devices subject to Directive 94/9/EC (ATEX).“ The seal lip materials GYLON® black, GYLON® white, GYLON® blue, as well as lips made of KF material and F material were examined.

The expert opinion found that **„there were no objections against the use of PS-SEAL® with a width of up to 12mm and the use of chrome oxide or chrome carbide coatings on the counter surface in potentially explosive atmospheres.“**

Summary of the details:

Although - with the exception of the KF material - all materials showed a resistance value of more than  $10^9$  Ohm, and are thus deemed to be chargeable in an electrostatic sense, the maximum transferred charge of less than 10 nC (nano Coulomb) was less than the material-specific minimum ignition charge (MZQ). According to information provided by the National Metrology Institute of Germany (PTB) this value is (for example) 12 nC (nano Coulomb) in the case of hydrogen in its most ignitable mixture. A table with the MZQ values of the most frequently used ignitable gases and mixtures is available on the website of the National Metrology Institute of Germany (PTB).

## **B) Ignition sparks arising from mechanical contact**

This ignition source can be ruled out if the system has been correctly installed and is used in accordance with the Garlock data sheet and the Garlock operation and assembly instructions, since the metal case is not in contact with the rotating parts.

## **C) Ignition arising from overheating occurring as the result of exposure to excess temperature, caused by friction between the seal and the sealing surface**

No general statements can be made in regard to the surface temperature. The development of the temperature under the seal lip depends on a great number of external influences and process parameters. An theoretical assessment - by means of calculations - may possibly be made based on certain assumptions and parameters, or empirically through testing. This assessment must be made separately for each application.

The ESA policy document mentioned above further recommends in Chapter B.2, „Please consult your mechanical seal manufacturer for estimations of maximum surface temperature for specific seal types“.

**We also wish to draw your attention to the fact that a final assessment of the ignition sources, in particular in regard to the maximum temperature according to DIN EN 13463-1 (harmonized standard pursuant to Directive 94/9/EC (ATEX)), must be carried out for the complete equipment or protective system, or for the complete safety devices, controlling devices and regulating devices, for which measurements in the installed state on the end product are or may be necessary.**

Note:  
Properties/applications shown throughout this brochure are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. For specific application recommendations consult Garlock. Failure to select the proper sealing products could result in property damage and/or serious personal injury. Performance data published in this brochure has been developed from field testing, customer field reports and/or in-house testing. While the utmost care has been used in compiling this brochure, we assume no responsibility for errors. Specifications subject to change without notice. This edition cancels all previous issues. Subject to change without notice GARLOCK is a registered trademark for packings, seals, gaskets, and other products of Garlock.  
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