



Exploration & Production

GENERAL SPECIFICATION

ROTATING MACHINERY

GS MEC 270

**Supply of mechanical seal
According API 682 1st edition**

01	08/03	Change of Group name and logo
00	02/01	First issue
Rev.	Date	Notes



Contents

1. Scope	4
2. Reference documents.....	4
3. Comments to ISO 13709 / API 682	5

Summary

This summary chart indicates where to find the information for each paragraph of [ISO 13709/API 682](#) shown with bullets.

Bullets	SGM	Job Specification	Data Sheet	Bullets	SGM	Job Specification	Data Sheet
2.3.9		•		4.5.4.3.8	•		
2.3.1.4			•	4.5.5.2	•		
2.3.19.1			•	4.6.1	•		
2.3.20			•	4.6.2	•		
2.4.10.4	•		•	4.6.3.1	•		•
2.6.1			•	4.6.4.1			•
2.6.2	•		•	4.6.4.2	•		
2.7.5.1			•	5.2.2	•		
2.7.5.4			•	5.4.3	•		
2.8			•	5.6.2			•
3.2.3	•		•	5.8.3			•
3.7.2			•	6.1.4			•
4.1.14			•	6.1.8			•
4.3			•	6.2.2			•
4.4.2	•			6.2.3	•		
4.4.3	•			6.2.13			•
4.4.4	•			6.3.1.12	•		
4.5.2.1	•			6.3.5.2.1			•
4.5.4.1	•			6.3.5.2.2			•
4.5.4.1.8	•						



1. Scope

This specification clarifies how to use the recommendations of [ISO 13709](#) or [API 682](#) for selection of mechanical seals supplied to the COMPANY.

The paragraph numbers of section 3, indicated in *italic*, are those of [ISO 13709](#) / [API 682](#), except for additional requirements which may be presented with new paragraph numbers.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ISO 13709	Shaft Sealing System for Centrifugal and Rotary Pumps

Professional Documents

Reference	Title
API 682	Shaft Sealing System for Centrifugal and Rotary Pumps

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. Comments to ISO 13709 / API 682

1 General

1.1 Scope

1.1.1 This specification extends the field of application for fluids at temperatures between -110°C (ethylene) and 450°C (thermal and visbreaker fluids).

For operating speeds above 3600 rpm, the seal specification shall always be done by the mechanical seal **VENDOR**.

1.1.2 The additional requirements set out on this specification are identified in the same way as **API 682** 1st edition.

1.4 Definition of terms

PS: The effective pressure in the seal chamber times the linear speed of the friction face in bar.m/sec (effective pressure when operating the pump at nominal rated point).

ΔTV: Difference between the fluid boiling temperature and the fluid pumping temperature at suction pressure.

1.5 Referenced publications

1.5.1 Apart projects based on American codes and standards, ISO standards and units shall be substituted wherever possible for the documents specified by the order, unless their requirements are not equivalent. Local regulations, if any, shall be applicable.

2 Seal design

2.1 Standard seal types and arrangement

2.1.4 Metal bellows may be used provided:

- The fluid conveyed presents no risk of corrosion or erosion to the bellow (maximal allowable wear: 10 µm/year)
- The MAWP is less than 20 bar, unless the **MANUFACTURER** can show evidence of successful experience at higher pressure.

Metal bellows are the primary selections in the following cases:

- Risk of fouling of the dynamic seal (hang up)
- Vacuum less than 0.8 bar abs.

Rotating bellows are primary selections when the fluid being pumped contains more than 2% solids by weight or is thixotropic, gumming, coagulating or crystallising. The vibration frequency shall be specified by the **VENDOR** in the data sheet.

2.2 General

2.2.1 All mechanical seal part shall withstand transient operating conditions: start up on water, wash, automatic start, re-acceleration, etc.

2.2.2 The following seals shall not be balanced:

- On asphalt pumps, more generally on screw pumps when the seals are subject to atmospheric pressure on suction side
- On top stirring shafts if the MAWP of the equipment is less than 5 bars.

2.3 Seal chamber and glands

2.3.1.5 Preference shall be given to tangential injection or circulation orifices. These shall be compulsory for abrasive fluid.

For low density fluids ($SG < 0.7$), a distribution ring shall be required.

2.3.1.6 On horizontal, overhung impeller centrifugal pumps with balancing holes, a vent orifice may be drilled at a high point of the mechanical seal chamber, towards the rear of the impeller.

Necessary tapped connections must be provided to monitor the inside pressure of the seal chamber (F tapped connection if not used).

2.4 Shaft sleeves

2.4.10.4 Unless otherwise specified in the data sheet, the split ring is prohibited.

2.5 Mating rings

2.5.2 The bonding and brazing of mating rings in cup mounted designs is prohibited.

2.6 Flexible elements

2.6.1 Except for perfectly clear and non corrosive fluids, preference shall be given to mechanical seals in which the springs are located outside the product being pumped.

2.6.2 Unless otherwise specified in the data sheet, o-ring secondary seals is recommended.

3 Materials

3.2 Seal faces

3.2.3 Pure (SiC) silicon carbon shall be used if $PH > 9$ on fluids containing hydrofluoric acid.

3.2.4 If a hard friction pairing is made up of two identical materials, the friction faces shall have a different degree of surface treatment to avoid adherence on start up.

3.9 Miscellaneous parts

3.9.1 Preference shall be given to driving and securing pins parallel to the shaft driving by single spring shall be submitted to the purchaser approval.

4 Accessories

4.4 Cooling water systems (Group III)

4.4.2 Galvanized pipe is prohibited.

4.4.3 Sight flow indicators shall be furnished.

4.4.4 Manifold outlet valve shall be furnished.

4.5 Accessories and auxiliary system components

4.5.2.1 Applicable.

4.5.4.1 Applicable.

4.5.4.1.8 Applicable.

4.5.4.3.8 Applicable.

4.5.5.2 The review of purchaser's selection of barrier/buffer fluid is compulsory.

4.6 Barrier/Buffer fluid and seal flush positive circulating devices

4.6.1/2 Unless otherwise specified internal circulating device is provided.

4.6.3.1 Unless otherwise specified internal circulating device is provided.

4.6.3.2 Motors, electrical components and installations shall be designed according IEC.

4.6.4.2 See **4.5.5.2**.

5 Instrumentation

5.2 Temperature indicating gauges

5.2.2 Dial gauges shall be installed on piping.

5.4 Pressure gauges

5.4.3 Oil filled gauges shall be furnished wherever vibrations are present.

6 Inspection, testing and preparation for shipment

6.2 Inspection

6.2.3 Applicable.

6.3 Testing

6.3.1 Seal MANUFACTURER Qualification Testing

Applicable only when offered mechanical seal has not been qualified (special design). The principle shall be approved by Purchaser.

6.3.2 Hydrostatic test for pressure containing parts

Mechanical seals shall not be fitted during the pump hydrostatic test.

6.3.5 Pump MANUFACTURER Seal Test

6.3.5.1.2 For "controlled leak" mechanical seals (hydrodynamic seals with circulation grooves), the leak shall be measured during operation at rated point (guarantee value).

7 MANUFACTURER data

Unless otherwise in conflict with the contract or the job specification, this section is applicable.