SPECIFICATION OF DRY GAS SEAL FOR RC

1. GENERAL SPECIFICATION:

For general details of dry gas seals, please refer General Specification No.TC52357.
For Seal Shaft and Housing Dimensions, please refer Specification No.TC52508

2. Applicable Standards / Codes

2.1. BHEL General Specification No. TC52357

2.2. BHEL Housing Dimension Specification No. TC52508

2.3. API 617 – 8th edition / API 692 – 1st edition

2.4. NACE MR0103/ MR0175

3. SCHEMATIC OF GAS SEAL SYSTEM: As per Job P&ID

4. Seal Construction

Sl No	Description	Type
4.1.	Dry gas seal configuration	Tandem
4.2.	Dry gas seal type	Bidirectional
4.3.	Intermediate labyrinth	Yes
4.4.	Barrier seal type	Carbon ring tertiary

5. AMBIENT CONDITIONS

Temperature	:	As per Job Spec
Relative Humidity	:	As per Job Spec

6. GAS COMPOSITION FOR VARIOUS CONTINUOUS OPERATING CONDITIONS:

1. Process gas composition: As per Job Spec

7. SEALING GAS

Primary Seal	**For Normal operation**	Dry, filtered and throttled process gas from compressor Discharge/ External Seal Gas
	For Startup	Process Gas/ External Seal Gas
	For settle out / startup from settle out/emergency	External seal Gas/ Process Gas
Secondary Seal		Nitrogen / ~~Plugged~~
Barrier Seal		Nitrogen / ~~Instrument Air~~

Rev. No.	Revisions	Prepared	Approved	Date
00	Refer to record of revisions	Suguna	YVRL	01-02-22

Site Utility Data					
Gas	**Parameter**	**Min**	**Nor**	**Max**	**Mech. Design**
Nitrogen	Pressure Kg/Cm^2 g	#	#	#	#
	Temperature ^oC	#	#	#	#
Sweet Gas	Pressure Kg/Cm2 g	#			
	Temperature ^oC				
Instrument Air	Pressure Kg/Cm2 g	#			
	Temperature ^oC				
MUG	Pressure Kg/Cm2 g	#			
	Temperature ^oC	#			
# As per Job Specification					

8. Notes: -

8.1. Seal Housing dimensions shall conform to the applicable variant of TC52508 (DGS Housing Dimensions)

8.2. Separate Job specification shall be provided which will include the project specific seal operating and design and site utility data

8.3. In addition to Clause 34 of TC52357, as per API 692 1st edition for packing of dry gas seals vendor to note the following: -

Dry gas shall be packed in metallic container with nitrogen purging arrangement.

8.4. Dry gas seal vendor shall submit written confirmation that the spare seal shall be suitable for use without any refurbishment for at least 5 years from the date of supply. Seal vendor shall provide necessary storage conditions to comply with the above requirement.

(i) If the spare seals are not used at all before 5 years and if the vendor's design standard practice is calling for any refurbishment / revalidation / requalification, after 5 years but before 10 years period, vendor shall accept to refurbish the spare seals free of charge for one time to the end customer

(ii) If the spare seals are used before 5 years, the above Part-(i) is not applicable.

8.5. This Clause overrides the clause.no.26 of TC52357.

Twelve (12) months from the date of commissioning of plant, or thirty (30) months from the date of dispatch of dry gas seal skid, whichever is earlier

8.6. The requirement of the seals indicated cover spares for the Main projects.

8.7. Slow roll requirement: Not applicable. However, there will be tilting operation with 4 strokes per minute wherein each stroke rotation is 60 deg, is to be considered for the seal design.

Ref. Doc. | COMP. FILE NAME

SEAL DESIGN DATA

Sl NO	Var No	01	02	03	04	05	06	07	08	09	10	11	12	13
	PARAMETER	ϕ80<ϕ<ϕ100	ϕ80<ϕ<ϕ100	Φ101<ϕ<ϕ120	Φ101<ϕ<ϕ120	Φ101<ϕ<ϕ120	Φ121<ϕ<ϕ135	Φ121<ϕ<ϕ135	Φ121<ϕ<ϕ135	Φ136<ϕ145	Φ136<ϕ145	Φ161<<ϕ180	Φ161<<ϕ180	Φ161<<ϕ180
1.	Service	H2 Rich	H2 Rich	H2 Rich	H2 Rich	Propylene	H2 Rich	H2 Rich	Propylene	Wet Gas	H2 Rich	H2 Rich	Wet Gas	Propylene
2.	DGS RC Qty	8	12	8	8	4	16	8	8	4	4	8	8	8
3.	DGS Fixture RC Qty	2	3	2	2	1	4	2	2	1	1	2	2	2
4.	100 % Speed Range (rpm)	11000 ÷ 14000	11000 ÷ 14000	10000 ÷ 12000	10000 ÷ 12000	5000 ÷ 6500	9000 ÷ 12500	9000 ÷ 12500	5000÷ 6500	8500÷ 11000	10000÷ 11000	7000÷ 9000	4000÷ 9000	4000÷ 7000
5.	Sealing Pressure Range (kg/cm2-a)	140÷160	6÷30	10÷40	10÷40	10÷420	50÷70	80÷100	10÷20	1.5÷3.5	1.5÷10	1.5 ÷7.0	1.5 ÷7.0	1.5 ÷7.0
6.	Seal Design Pressure (kg/cm2-a)	180÷200	15÷50	15÷50	15÷50	20÷40	90÷120	130÷165	20÷40	5÷20	5÷20	8÷25	8÷25	8÷25
7.	Min Design Temp (°C)	0	0	0	0	-45	0	0	-45	0	0	0	0	-45
8.	Max Design Temp (°C)	180	180	180	230	90÷150	180	180	90÷150	180	230	180	180	180
9.	Test Gas	Helium Or Air/N2 Mix	→	→	→	→	→	→	→	→	→	→	→	→
10.	Primary Seal Gas	From Compr Disch	→	→	→	→	→	→	→	From Compr Disch	→	→	N2/ Fuel Gas	→
11.	Material Code DGS	← Later →												
12.	Material Code - DGS Fixtures	← Later →												

Notes:
Following are to be Sourced from same vendor: -

1. 4 Nos as per variant 10 & 8 Nos as per variant 04
2. 8 Nos as per variant 03; 4 Nos as per variant 02
3. 8 Nos as per variant 13; 4 Nos as per variant No 05

RECORD OF REVISIONS

Rev. No.	Date	Revision Details	Revised	Approved
00	01-02-22	New Standard	SUGUNA	YVRL