

## Packager Guidelines

### Section 9: 3<sup>rd</sup> Party Supplier Guideline

#### 9-1. Purge Flow Estimates

Packing under very good conditions will leak approximately .1 of a standard cubic foot per minute (SCFM). Factors such as rod finish, alignment and case condition will affect the leakage.

The nitrogen usage to the purge connection will be approximately one cubic foot per hour flow rate. This will vary as packing wear occurs. These case improvements have reduced emissions from 1000 PPM down to 10 PPM (without purge gas) and essentially 0 PPM with purge gas applied.

Purge/buffer gas pressure is to be maintained higher than the vent / drain pressure by at least 15 PSI.

#### TYPICAL FLOW RATE

	SCFM (M <sup>3</sup> /min)
Past Normal Lube Packing Ring	.1-.3 (0.002 – 0.008)
With Non Lube or Light Gases	.2-.6 (0.005 – 0.016)
Vent Flow Alarm for System Check	.2-.3 (0.005 – 0.008)
Purge Gas Into Distance Piece	.1-.3 (0.002 – 0.008)
Purge Gas Into Vent	.1-.3 (0.002 – 0.008)

Below rates are listed in API Appendixes "G & I".

Purge Gas Rate Initially - 10 SCFH/CASE = .08 Cubic Decimeters / Sec.  
Set Meter Range = 5 to 50 SCFH = .04 to .4 Cubic Decimeters / Sec.

#### 9-2. Vibration Monitoring

	Alarm						Shutdown					
	Displacement			Velocity			Displacement			Velocity		
	Peak to Peak	Peak	RMS	Peak to Peak	Peak	RMS	Peak to Peak	Peak	RMS	Peak to Peak	Peak	RMS
Foundation	0.006 in (0.15 mm)	0.003 in (0.08 mm)	0.002 in (0.05 mm)	0.800 in/s (20.32 mm/s)	0.400 in/s (10.16 mm/s)	0.283 in/s (7.19 mm/s)	0.008 in (0.20 mm)	0.004 in (0.10 mm)	0.003 in (0.08 mm)	1.200 in/s (30.48 mm/s)	0.600 in/s (15.24 mm/s)	0.424 in/s (10.77 mm/s)
Pump End of Frame	0.008 in (0.20 mm)	0.004 in (0.10 mm)	0.003 in (0.08 mm)	1.200 in/s (30.48 mm/s)	0.600 in/s (15.24 mm/s)	0.424 in/s (10.77 mm/s)	0.011 in (0.28 mm)	0.006 in (0.15 mm)	0.004 in (0.10 mm)	1.800 in/s (45.72 mm/s)	0.900 in/s (22.86 mm/s)	0.636 in/s (16.15 mm/s)
Outer End of Cylinder	0.013 in (0.33 mm)	0.007 in (0.18 mm)	0.005 in (0.13 mm)	2.000 in/s (50.80 mm/s)	1.000 in/s (25.40 mm/s)	0.707 in/s (17.96 mm/s)	0.020 in (0.51 mm)	0.010 in (0.25 mm)	0.007 in (0.18 mm)	3.000 in/s (76.20 mm/s)	1.500 in/s (38.10 mm/s)	1.061 in/s (26.95 mm/s)
Scrubber	0.013 in (0.33 mm)	0.007 in (0.18 mm)	0.005 in (0.13 mm)	2.000 in/s (50.80 mm/s)	1.000 in/s (25.40 mm/s)	0.707 in/s (17.96 mm/s)	0.020 in (0.51 mm)	0.010 in (0.25 mm)	0.007 in (0.18 mm)	3.000 in/s (76.20 mm/s)	1.500 in/s (38.10 mm/s)	1.061 in/s (26.95 mm/s)

**9-3. Vertical Frame Thermal Growth**

The vertical thermal growth (foot to crankshaft) for all frames can be expected to be in the following ranges:

MOS	.005" - .008" (0.13 – 0.20 mm)
HOS	.005" - .008" (0.13 – 0.20 mm)
HOSS	.007" - .010" (0.18 – 0.25 mm)

**9-4. Packing RTD Temperature Setting Recommendations**

The following temperature limits were established to safeguard the operation of separable compressor packings. Packing case temperature should not exceed 300° F (149°C).

Alarm Setting	20° F (11°C) Above Normal Packing Operating Temperature
Shutdown Setting	30° F (16.7°C) Above Normal Packing Operating Temperature

**9-5. Main Bearing Temperature Setting Recommendations**

The following temperature limits were established to safeguard the operation of separable compressor main bearings.

Maximum Alarm Setting	210° F (99°C)
Maximum Shutdown Setting	220° F (104°C)
Main Bearing ΔT (Bearing to Bearing)	Not to Exceed 20°F (11°C) (Compressor Fully Heat Soaked)

**NOTE:** It is recommended that the main bearing RTD alarm and shutdown be set at 20° F (11°C) or 30° F (16.7°C) respectively above the average of all the main bearing temperatures.