

# MAINTENANCE TRACKING TOOL

## Vacuum

Test of vacuum tightness on PSS

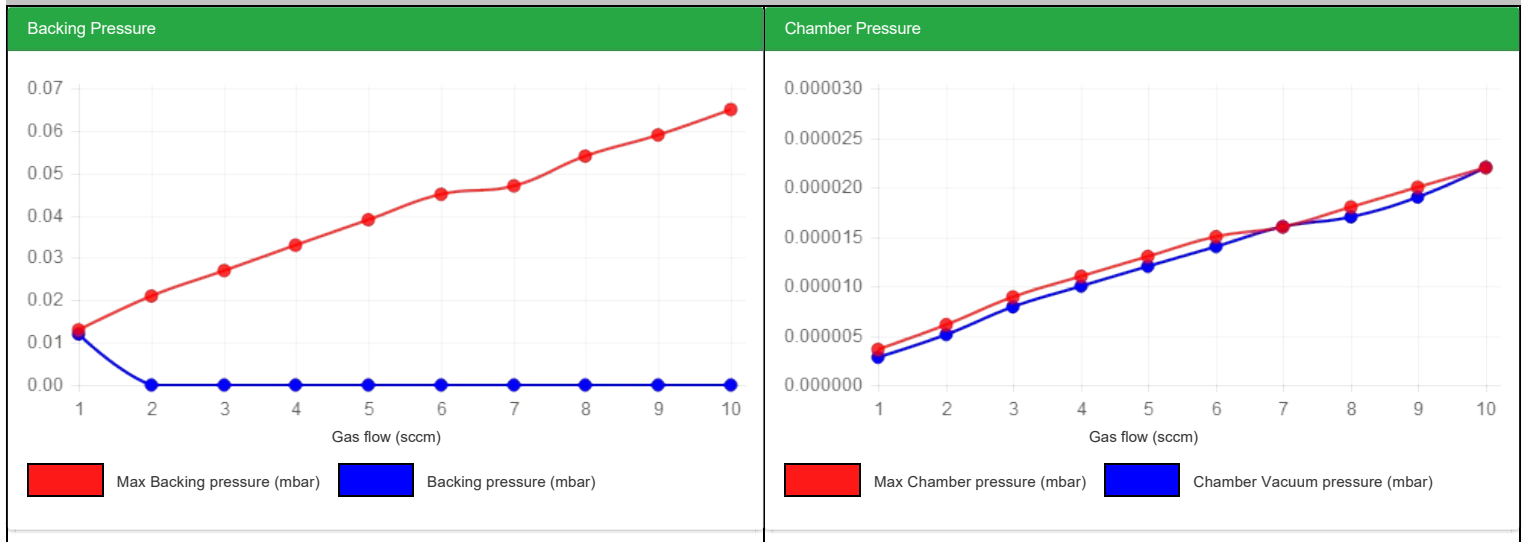
Plot vacuum pressure as function of gas flow from 1sccm to 10 sccm.

Vacuum pressure vs gas pressure should be a linear relationship.

Gas flow setting: 5,0 +/- 1 sccm

Gas flow	Chamber vacuum pressure (mbar)	Backing pressure	Max Chamber pressure (mbar)	Max Backing pressure (mbar)
1	2.8E-6	0.012	3,60E-06	1,30E-02
2	5.1E-6	0	6,10E-06	2,10E-02
3	7.9E-6	0	8,90E-06	2,70E-02
4	1.0E-5	0	1,10E-05	3,30E-02
5	1.2E-5	0	1,30E-05	3,90E-02
6	1.4E-5	0	1,50E-05	4,50E-02
7	1.6E-5	0	1,60E-05	4,70E-02
8	1.7E-5	0	1,80E-05	5,40E-02
9	1.9E-5	0	2,00E-05	5,90E-02
10	2.2E-5	0	2,20E-05	6,50E-02

OK value
Too low value



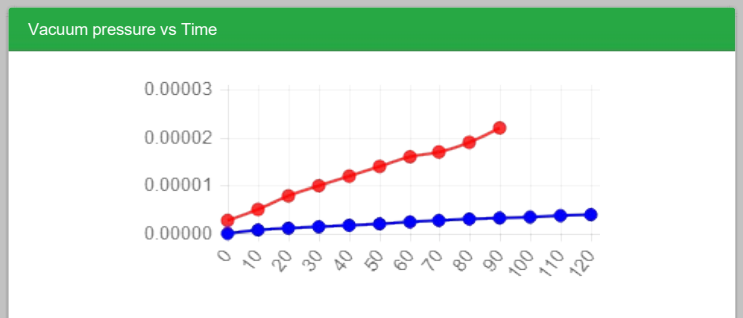
**Pass criteria:** Linear relationship between vacuum pressure and gas flow. (Blue line should be below red line)

### Vacuum leak test performed on PSS

With the vacuum system operating in pump mode with all BEV closed and without gas flow.

Set Vacuum system on VCU to Standby and observe the leak rate into the cavity (using pressure as proxy)

Time from Set Standby (sec)	Vacuum pressure (mbar)	Max leak rate
0	1.0E-7	1,80E-07
10	8.3E-7	1,00E-06
20	1.2E-6	1,50E-06
30	1.5E-6	1,90E-06
40	1.8E-6	2,30E-06
50	2.1E-6	2,70E-06
60	2.5E-6	3,00E-06
70	2.8E-6	3,30E-06
80	3.1E-6	3,60E-06
90	3.3E-6	3,90E-06
100	3.5E-6	4,20E-06
110	3.8E-6	4,60E-06
120	4.0E-6	4,90E-06



**Pass criteria:** Time to reach 1.0E-5 mbar > 10 s (Blue line should be below red line)

Vacuum	<ul style="list-style-type: none"> <li>Switch on the water cooling to the diffusion pump</li> <li>Press STANDBY on the VCU, record time</li> </ul>		
	<b>Standby time</b>		
	Actual standby start time:	10:27	
	<ul style="list-style-type: none"> <li>Verify that the green DP-lamp on the VCU lights up within 30min, re-adjust DP temp-switch as required</li> </ul>		
	<b>DP-lamp activation time</b>		
	DP -lamp activated in (min):	0	Max 30min
	<ul style="list-style-type: none"> <li>Press PUMP on the VCU and note the following values:</li> </ul>		
	<b>Pumping down</b>		
	Time before HVV opening	11	10-15 min
	Actual time for HVV opening:	0	<30s
Actual time to reach 1.0*E-5	0		
<ul style="list-style-type: none"> <li>After reaching the vacuum value of 1.0*E-5 open the IS gas flow at 10sccm for 15 minutes</li> </ul>			

Vacuum	<p><b>WARNING! Diffusion pump may be very warm, verify that at least 2hrs has passed since pump shutdown.</b></p> <p><b>WARNING! Rotary and/or diffusion pump oil may be radioactive, verify activity level by performing an activity survey!</b></p> <p><b>NOTE! Verify that all cables are free from interference with the diffusion pump, interference may cause cable melting and/or electrical shortcut</b></p> <ul style="list-style-type: none"> <li>Verify the oil level and the color of the rotary pump oil, re-fill or change as required, record re-filled or changed volume</li> </ul>		
	<b>Rotary pump oil level</b>		
	Date of the last replacement of oil:	2022-11-07	
	Volume filled/changed (ml):	0	
	<b>Maintenance of the diffusion pump: to be performed every 5 years</b>		
	Last maintenance of the diffusion pump		
	<p>Ventilate the diffusion pump by removing Pirani 1</p> <p><b>NOTE! Verify that the water cooling is shut off before disconnection of the diffusion pump</b></p> <ul style="list-style-type: none"> <li>Remove the diffusion pump and drain the oil</li> </ul> <p><b>NOTE! Measure the length of the Jet assy before it is disassembled. The length is critical to pump performance.</b></p> <ul style="list-style-type: none"> <li>Disassemble and clean the diffusion pump</li> <li>Replace the heater</li> <li>Reassemble, reinstall and fill the diffusion pump with new oil</li> </ul>		
	<b>Diffusion pump oil replacement</b>		
	Volume filled/changed (ml):	0	
	<ul style="list-style-type: none"> <li>Verify the condition of the rotary pump oil mist filter, clean, inspect or replace as required</li> <li>Verify the condition of the rotary pump oil mist filter O-ring, clean, inspect for damage and/or deformation, replace as required</li> <li>Verify the functionality of the pirani gauges and the penning gauge, clean, inspect or replace as required</li> </ul>		

Comments:	comments added here on Vacuum test performance or activities to be done during activities
PHOTO:	<b>Photo name:</b>
	