

Flow Rate Adjustment Worksheet

Customer Name:			
Date		Product	
Target Rate (L/ha)		Planting Speed (KPH)	
Number of Rows		Optimal Operating Pressure (Bar)	
Row Spacing (cm)			

1. Set up the Mobile Max to match the customer's planter setup with # of rows, row spacing, and vApply HD module and Flowsense locations.
2. From the Diagnose screen, enter a health check for a liquid product and enter the desired L/ha and KM/H.
3. Once the pump is running, make sure Actual L/ha and Commanded L/ha match on 20/20 before continuing.
4. Perform bucket test for 1 minute total and compare Milliliters Caught vs. Milliliters Expected. (It is recommended to repeat this step 3 times and use an average of all tests.)
 - a. Milliliters Caught = _____ ml/min
 - b. Milliliters Expected = _____ ml/min (found on HealthCheck page)
5. If these values match, no flow rate adjustment is needed, continue to orifice sizing steps.
6. Calculate the % difference between caught value and measured value.
 - a.
$$\frac{(\text{_____ Milliliters Expected} - \text{_____ Milliliters Caught})}{\text{_____ Milliliters Caught}} \times 100 = \text{_____ \%}$$
7. Enter % Change calculated into the flow rate adjustment page.

vApply HD Flow Rate Adjustment _____ % Flowsense

Flow Rate Adjustment = _____ % x -1 = _____ %

Note - It is strongly recommended to run a bucket test (repeated 3 times) with the flow rate adjustment entered to verify accuracy.

Non-HD controlled orifice Verification Worksheet

Customer Name:			
Date		Product	
Target Rate (L/ha)		Planting Speed (KPH)	
Number of Rows		Optimal Operating Pressure (Bar)	
Row Spacing (cm)			

1) Complete a flow rate adjustment for Flowsense before proceeding.

2) Set up Liquid Max stand to run customer's product through Flow Sense and orifice body and install charted orifice size.

- a) _____ L/ha X _____ KM/H _____ bar width X .00166 = _____ Target L/Min
 _____ Target L/Min / _____ # of rows = _____ L/Min per row
- b) Customer's intended System Pressure _____ Bar
- c) _____ Charted Orifice Size.

3) From the diagnose page, enter a manual test on Liquid Max and enter target L/ha and KM/H in tabs.

4) Use PWM% and bypass on Liquid max to set desired system pressure.

5) Measure actual L/ha using Flow Sense _____ L/Min

6) Calculate the % difference between actual GPM and target GPM.

$$(\text{_____ L/Min target} - \text{_____ L/M Actual}) / \text{_____ L/Min Actual} \times 100 = \text{_____ \% difference.}$$

7) Resize using % difference on charted orifice size by using calculation below.

$$(1 + (\text{_____ \% difference} / 100)) \times \text{_____ charted orifice size} = \text{_____ adjusted size}$$

8) Adjust Rate and speed to determine minimum and maximum GPM per orifice.

Results:

Adjusted Orifice Size _____

Target System Pressure _____ Bar

Minimum LPM @ 0,7 Bar _____ L/Min

Maximum LPM @ Customer's maximum system pressure _____ L/Min

Post vApply HD Orifice sizing Worksheet

Follow steps to find appropriate orifice size based on customer's rate and product.

Customer Name: _____			
Date		Product	
Target Rate (L/ha)		Planting Speed (KPH)	
Number of Rows		Optimal Operating Pressure (Bar)	
Row Spacing (cm)			

1. Complete a flow rate adjustment for vApplyHD and Flow Sense (if applicable) before proceeding.
2. Find Target GPM per application point. (consider if each FurrowJet is 3 points, Dual Conceal is 2)
 - a. _____ L/ha X _____ KM/H X _____ bar width X .00166 = _____ Target L/Min
 - b. _____ Target L/Min / _____ # of rows = _____ L/Min per row
 - c. If more than 1 application point per row, divide target L/Min per row by # of points.
_____ L/Min per row, per application point
 - d. For some higher rates and thicker products, it may be necessary to oversize GPM from the orifice chart to find appropriate orifice size.
 - e. In some instances, the percent increase could range from 10-30%+ (or more in edge cases) _____ Oversized L/Min
3. Use a Target Bar pressure that is less than Optimal System Pressure
 - a. A good guideline is to divide System Pressure by half.
_____ system Bar pressure divided by 2 = _____ Adjusted Bar pressure
- b. Use Oversized Rate from step 2 and Adjusted PSI from step 3A to size orifice using manufacture's orifice chart.
4. Verify on LiquidMax with Customer's product optimal orifice size.
 - a. The system should be able to reach the customer's Target L/Min with post vApply HD Bar pressure above 0,7 Bar (2,7 Bar if running FurrowJet) and below system pressure.
 - b. Also make sure the ball valve position is well under 50 while running target GPM. This will ensure the vApply HD can still adjust flow hit Target L/Min.

Orifice Recommendation _____

Test Results:

Maximum planting speed at customer's maximum target rate _____

Minimum planting speed at customer's minimum target rate _____

Maximum rate _____ @ **AVG** _____ **KM/hours**

Minimum rate _____ @ **AVG** _____ **KM/hours**

Orifice Plate Chart

	l/min						
	0.5 bar	1 bar	1.5 bar	2 bar	2.5 bar	3 bar	4 bar
CP4916-008	0.013	0.018	0.023	0.026	0.029	0.032	0.037
CP4916-10	0.021	0.029	0.036	0.042	0.047	0.051	0.059
CP4916-12	0.031	0.043	0.053	0.061	0.068	0.075	0.087
CP4916-14	0.040	0.057	0.070	0.081	0.090	0.099	0.11
CP4916-15	0.045	0.064	0.078	0.090	0.10	0.11	0.13
CP4916-16	0.053	0.075	0.092	0.11	0.12	0.13	0.15
CP4916-18	0.069	0.098	0.12	0.14	0.16	0.17	0.20
CP4916-20	0.086	0.12	0.15	0.17	0.19	0.21	0.24
CP4916-22	0.098	0.14	0.17	0.20	0.22	0.24	0.28
CP4916-24	0.12	0.17	0.21	0.24	0.27	0.29	0.34
CP4916-25	0.13	0.18	0.22	0.25	0.28	0.31	0.36
CP4916-26	0.14	0.20	0.24	0.28	0.31	0.34	0.39
CP4916-27	0.15	0.21	0.26	0.29	0.33	0.36	0.42
CP4916-28	0.16	0.23	0.28	0.32	0.36	0.39	0.45
CP4916-29	0.18	0.25	0.30	0.35	0.39	0.43	0.50
CP4916-30	0.18	0.26	0.32	0.37	0.41	0.45	0.52
CP4916-31	0.20	0.28	0.35	0.40	0.45	0.49	0.57
CP4916-32	0.22	0.31	0.38	0.43	0.48	0.53	0.61
CP4916-34	0.24	0.34	0.41	0.47	0.53	0.58	0.67
CP4916-35	0.25	0.36	0.44	0.51	0.57	0.62	0.72
CP4916-37	0.28	0.39	0.48	0.56	0.62	0.68	0.79
CP4916-39	0.31	0.43	0.53	0.61	0.69	0.75	0.87
CP4916-40	0.33	0.47	0.57	0.66	0.74	0.81	0.94
CP4916-41	0.34	0.48	0.59	0.68	0.76	0.83	0.96
CP4916-43	0.37	0.53	0.64	0.74	0.83	0.91	1.05
CP4916-45	0.40	0.57	0.70	0.81	0.90	0.99	1.14
CP4916-46	0.44	0.62	0.76	0.87	0.98	1.07	1.24

	l/min						
	0.5 bar	1 bar	1.5 bar	2 bar	2.5 bar	3 bar	4 bar
CP4916-47	0.45	0.63	0.77	0.89	1.00	1.09	1.26
CP4916-48	0.46	0.65	0.80	0.92	1.03	1.13	1.31
CP4916-49	0.47	0.67	0.82	0.95	1.06	1.16	1.34
CP4916-51	0.53	0.75	0.92	1.06	1.19	1.30	1.50
CP4916-52	0.54	0.76	0.93	1.08	1.21	1.32	1.52
CP4916-54	0.58	0.82	1.00	1.16	1.30	1.42	1.64
CP4916-55	0.61	0.86	1.05	1.22	1.36	1.49	1.72
CP4916-57	0.65	0.91	1.12	1.29	1.44	1.58	1.82
CP4916-59	0.70	0.99	1.21	1.40	1.56	1.71	1.98
CP4916-61	0.75	1.06	1.30	1.50	1.68	1.84	2.13
CP4916-63	0.79	1.12	1.37	1.58	1.77	1.94	2.24
CP4916-65	0.84	1.19	1.46	1.68	1.88	2.06	2.38
CP4916-67	0.89	1.26	1.55	1.79	2.00	2.19	2.53
CP4916-68	0.92	1.31	1.60	1.85	2.06	2.26	2.61
CP4916-70	0.99	1.40	1.71	1.98	2.21	2.42	2.79
CP4916-72	1.03	1.46	1.79	2.07	2.31	2.53	2.92
CP4916-73	1.07	1.51	1.85	2.13	2.38	2.61	3.01
CP4916-75	1.12	1.58	1.94	2.24	2.50	2.74	3.16
CP4916-78	1.24	1.76	2.15	2.48	2.78	3.04	3.51
CP4916-80	1.28	1.81	2.21	2.56	2.86	3.13	3.61
CP4916-81	1.32	1.87	2.29	2.65	2.96	3.24	3.74
CP4916-83	1.45	2.04	2.50	2.89	3.23	3.54	4.09
CP4916-86	1.52	2.14	2.62	3.03	3.39	3.71	4.28
CP4916-89	1.58	2.23	2.74	3.16	3.53	3.87	4.47
CP4916-91	1.68	2.38	2.91	3.36	3.76	4.12	4.76
CP4916-93	1.76	2.49	3.06	3.53	3.94	4.32	4.99
CP4916-95	1.84	2.60	3.19	3.68	4.12	4.51	5.21

	l/min						
	0.5 bar	1 bar	1.5 bar	2 bar	2.5 bar	3 bar	4 bar
CP4916-98	2.01	2.85	3.49	4.03	4.50	4.93	5.69
CP4916-103	2.10	2.97	3.64	4.21	4.70	5.15	5.95
CP4916-107	2.36	3.34	4.09	4.72	5.28	5.78	6.67
CP4916-110	2.50	3.53	4.33	5.00	5.59	6.12	7.07
CP4916-115	2.76	3.90	4.77	5.51	6.16	6.75	7.79
CP4916-120	2.87	4.06	4.97	5.74	6.42	7.03	8.12
CP4916-125	3.16	4.47	5.47	6.32	7.07	7.74	8.94
CP4916-128	3.29	4.65	5.69	6.57	7.35	8.05	9.30
CP4916-132	3.53	4.99	6.11	7.06	7.89	8.64	9.98
CP4916-136	3.83	5.41	6.63	7.65	8.55	9.37	10.8
CP4916-140	4.08	5.77	7.06	8.16	9.12	9.99	11.5
CP4916-144	4.22	5.97	7.31	8.44	9.44	10.3	11.9
CP4916-147	4.34	6.14	7.52	8.69	9.71	10.6	12.3
CP4916-151	4.74	6.70	8.20	9.47	10.6	11.6	13.4
CP4916-156	5.01	7.08	8.67	10.0	11.2	12.3	14.2
CP4916-161	5.26	7.44	9.12	10.5	11.8	12.9	14.9
CP4916-166	5.53	7.82	9.57	11.1	12.4	13.5	15.6
CP4916-170	5.94	8.40	10.3	11.9	13.3	14.6	16.8
CP4916-172	6.18	8.74	10.7	12.4	13.8	15.1	17.5
CP4916-177	6.45	9.12	11.2	12.9	14.4	15.8	18.2
CP4916-182	6.71	9.49	11.6	13.4	15.0	16.4	19.0
CP4916-187	7.11	10.1	12.3	14.2	15.9	17.4	20.1
CP4916-196	7.89	11.2	13.7	15.8	17.6	19.3	22.3
CP4916-205	8.55	12.1	14.8	17.1	19.1	20.9	24.2
CP4916-218	9.60	13.6	16.6	19.2	21.5	23.5	27.2
CP4916-234	11.2	15.8	19.4	22.4	25.0	27.4	31.6
CP4916-250	12.9	18.2	22.3	25.8	28.8	31.6	36.5