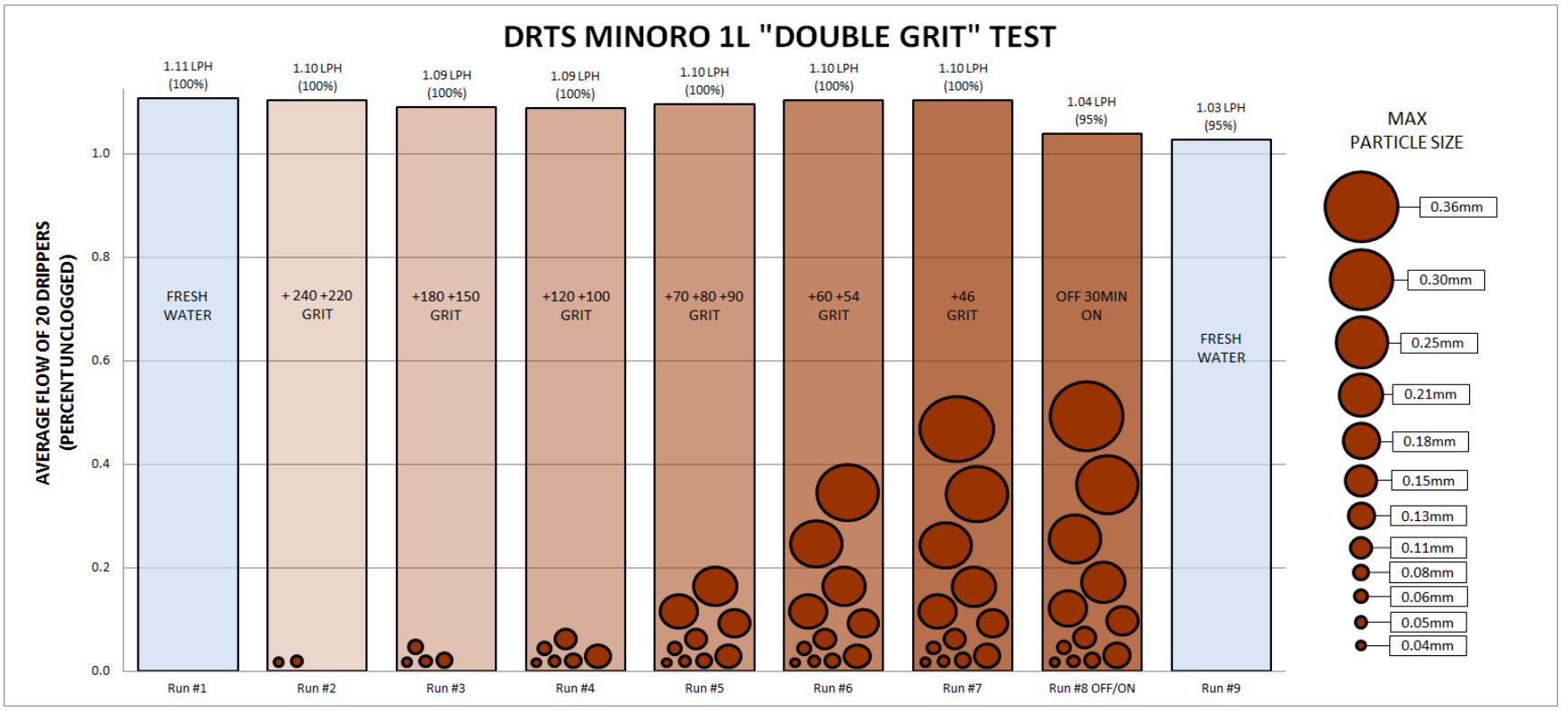
Center For Irrigation Technology



Date: 15-Nov Test # 1 Technician(s): Paul

Pressure: 1.0 bar Grit Concentration: 250 ppm/grit Supervisor: Joe

EMITTER FLOWRATE IN LPH Velocity: 0.9 m/sec. Title: 16MM Minoro 1L

Date:	13-Nov	14-Nov	14-Nov	14-Nov	14-Nov	14-Nov	14-Nov	14-Nov	14-Nov
Temp. °C	20.1	19.9	21.0	21.5	21.8	23.0	23.8	23.5	21.6
Emitter #	Run #1 Filtered Water Only	Run #2 water +240 & 220	Run #3 water +240, 220, 180 & 150	Run #4 water +240, 220, 180, 150, 120 & 100	Run #5 water +240, 220, 180, 150, 120, 100, 90, 80 & 70	Run #6 water +240, 220, 180, 150, 120, 100, 90, 80, 70, 60 & 54	Run #7 water +240, 220, 180, 150, 120, 100, 90, 80, 70, 60, 54, & 46	Run #8 OFF/ON (3)	Run #9 Fresh water (4)
1	1.08	1.08	1.08	1.08	1.08	1.08	1.11	1.11	1.05
2	1.11	1.11	1.08	1.05	1.08	1.05	1.08	1.08	1.05
3	1.14	1.08	1.11	1.11	1.11	1.08	1.08	1.08	1.05
4	1.11	1.08	1.11	1.08	1.11	1.14	1.11	1.08	1.08
5	1.08	1.08	1.08	1.08	1.08	1.11	1.14	1.11	1.11
6	1.08	1.11	1.11	1.11	1.11	1.11	1.17	1.11	1.08
7	1.08	1.08	1.08	1.08	1.08	1.14	1.11	1.08	1.05
8	1.11	1.11	1.08	1.11	1.14	1.14	1.14	1.14	1.02
9	1.14	1.11	1.11	1.08	1.11	1.08	1.11	1.14	1.08
10	1.14	1.14	1.11	1.14	1.11	1.11	1.11	1.14	1.14
11	1.11	1.14	1.11	1.14	1.08	1.14	1.11	1.11	1.11
12	1.14	1.11	1.08	1.08	1.11	1.08	1.14	1.02	1.11
13	1.14	1.11	1.05	1.11	1.08	1.05	1.08	0.00	0.00
14	1.08	1.08	1.11	1.08	1.11	1.11	1.05	1.05	1.05
15	1.11	1.08	1.08	1.11	1.14	1.11	1.08	1.08	1.14
16	1.08	1.11	1.08	1.08	1.08	1.08	1.08	1.08	1.08
17	1.08	1.11	1.08	1.05	1.08	1.08	1.08	1.08	1.08
18	1.14	1.14	1.08	1.05	1.14	1.11	1.11	1.11	1.11
19	1.11	1.11	1.11	1.08	1.05	1.14	1.11	1.08	1.08
20	1.08	1.11	1.08	1.08	1.05	1.14	1.08	1.08	1.08
AVG	1.11	1.10	1.09	1.09	1.10	1.10	1.10	1.04	1.03
SD	0.03	0.02	0.02	0.03	0.03	0.03	0.03	0.25	0.24
CV(5)	2.3%	1.9%	1.6%	2.4%	2.4%	2.7%	2.6%	23.7%	23.7%
# Plugged (6)	0	0	0	0	0	0	0	1	1

NOTES:

(1) All emitter samples provided by: **DRTS**

Test Performed by the Center for Irrigation Technology CSUF, Fresno, CA. to standard plugging protocol. Copies of test protocol available on request.

Emitter specification:

(2) Materials added are Aluminum Oxide Grits as manufactured by Fusco Abrasive Systems, Inc. Compton, California to ANSI B 74.12-1992 Standards

(3) System shut down for 30 minutes, then restarted and measured.

(4) System completely flushed, added 200 mesh screen, and measured.

(5) CV in the context of this report is used for statistic clarification and not meant to represent coefficient of manufacturing variability

(6) Flow less than 1.0 ml / minute

The Center for Irrigation Technology (CIT) at California State University, Fresno is the only independent laboratory in the United States specializing in testing and evaluating irrigation products. CIT has two test protocols for determining dripper sensitivity to clogging. The Single Grit and the Double Grit tests were used to develop the DRTS Minoro dripper. The Single Grit test is typically used to recommend filter mesh sizes for irrigation systems and the Double Grit test is used by the mining industry for extreme clogging applications.

The Double Grit test is a variation on the Single grit test where two or three grits are added at a time. It is administered as follows:

"Double Grit" Test		
Grit No.	**Max Particle Size**	
	inches	**mm**
240	0.0018	0.045
220	0.0021	0.053
180	0.0025	0.063
150	0.0030	0.075
120	0.0042	0.106
100	0.0049	0.125
90	0.0059	0.150
80	0.0071	0.180
70	0.0083	0.212
60	0.0098	0.250
54	0.0118	0.300
46	0.0140	0.355

Flow rates are measured with clean water using a graduated cylinder and a stop watch. The system has a fine mesh screen on this run to insure that the water is clean. During the test the screen is changed as required to pass all of the introduced grit materials. While the system is running grit no. 240 & 220 are added and the emitter flow rates are remeasured. This process is repeated adding ever coarser grits 2 or 3 at a time until grit no. 46 is added. The system is then shut down for 30 minutes and restarted. The system is then purged of all grits, the fine mesh filter re-installed, and the system filled with fresh water. The system is repressurized, and the emitter flow rates measured which concludes the test.