

*Always verify tips or orifices you received are the size which you require before using with chemical. Chemical rates need to be obtained from your chemical dealer.

Technical Information

Universal Application Rate Chart for 15" Tip Spacing

TIP CAPACITY	LIQUID PRESSURE IN PSI	CAPACITY 1 NOZZLE IN GPM	CAPACITY 1 NOZZLE IN OZ./MIN.	GALLONS PER ACRE - 15" NOZZLE SPACING											
				4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH	18 MPH	20 MPH	22 MPH
01	15	0.061	7.8	6.0	4.8	4.0	3.5	3.0	2.4	2.0	1.7	1.5	1.3	1.2	1.1
	20	0.071	9.1	7.0	5.6	4.7	4.0	3.5	2.8	2.3	2.0	1.8	1.6	1.4	1.3
	30	0.087	11	8.6	6.9	5.7	4.9	4.3	3.4	2.9	2.5	2.2	1.9	1.7	1.6
	40	0.10	13	9.9	7.9	6.6	5.7	5.0	4.0	3.3	2.8	2.5	2.2	2.0	1.8
	50	0.11	14	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1	2.7	2.4	2.2	2.0
	60	0.12	15	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2
	75	0.14	18	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0	3.5	3.1	2.8	2.5
90	0.15	19	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	2.7	
015	15	0.092	12	9.1	7.3	6.1	5.2	4.6	3.6	3.0	2.6	2.3	2.0	1.8	1.7
	20	0.11	14	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1	2.7	2.4	2.2	2.0
	30	0.13	17	12.9	10.3	8.6	7.4	6.4	5.1	4.3	3.7	3.2	2.9	2.6	2.3
	40	0.15	19	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	2.7
	50	0.17	22	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1
	60	0.18	23	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	3.2
	75	0.21	27	21	16.6	13.9	11.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.8
90	0.23	29	23	18.2	15.2	13.0	11.4	9.1	7.6	6.5	5.7	5.1	4.6	4.1	
02	15	0.12	15	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2
	20	0.14	18	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0	3.5	3.1	2.8	2.5
	30	0.17	22	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1
	40	0.20	26	19.8	15.8	13.2	11.3	9.9	7.9	6.6	5.7	5.0	4.4	4.0	3.6
	50	0.22	28	22	17.4	14.5	12.4	10.9	8.7	7.3	6.2	5.4	4.8	4.4	4.0
	60	0.24	31	24	19.0	15.8	13.6	11.9	9.5	7.9	6.8	5.9	5.3	4.8	4.3
	75	0.27	35	27	21	17.8	15.3	13.4	10.7	8.9	7.6	6.7	5.9	5.3	4.9
90	0.30	38	30	24	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.4	
025	15	0.15	19	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	2.7
	20	0.18	23	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	3.2
	30	0.22	28	22	17.4	14.5	12.4	10.9	8.7	7.3	6.2	5.4	4.8	4.4	4.0
	40	0.25	32	25	19.8	16.5	14.1	12.4	9.9	8.3	7.1	6.2	5.5	5.0	4.5
	50	0.28	36	28	22	18.5	15.8	13.9	11.1	9.2	7.9	6.9	6.2	5.5	5.0
	60	0.31	40	31	25	20	17.5	15.3	12.3	10.2	8.8	7.7	6.8	6.1	5.6
	75	0.34	44	34	27	22	19.2	16.8	13.5	11.2	9.6	8.4	7.5	6.7	6.1
90	0.38	49	38	30	25	21	18.8	15.0	12.5	10.7	9.4	8.4	7.5	6.8	
03	15	0.18	23	17.8	14.3	11.9	10.2	8.9	7.1	5.9	5.1	4.5	4.0	3.6	3.2
	20	0.21	27	21	16.6	13.9	11.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.8
	30	0.26	33	26	21	17.2	14.7	12.9	10.3	8.6	7.4	6.4	5.7	5.1	4.7
	40	0.30	38	30	24	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.4
	50	0.34	44	34	27	22	19.2	16.8	13.5	11.2	9.6	8.4	7.5	6.7	6.1
	60	0.37	47	37	29	24	21	18.3	14.7	12.2	10.5	9.2	8.1	7.3	6.7
	75	0.41	52	41	32	27	23	20	16.2	13.5	11.6	10.1	9.0	8.1	7.4
90	0.45	58	45	36	30	25	22	17.8	14.9	12.7	11.1	9.9	8.9	8.1	
04	15	0.24	31	24	19.0	15.8	13.6	11.9	9.5	7.9	6.8	5.9	5.3	4.8	4.3
	20	0.28	36	28	22	18.5	15.8	13.9	11.1	9.2	7.9	6.9	6.2	5.5	5.0
	30	0.35	45	35	28	23	19.8	17.3	13.9	11.6	9.9	8.7	7.7	6.9	6.3
	40	0.40	51	40	32	26	23	19.8	15.8	13.2	11.3	9.9	8.8	7.9	7.2
	50	0.45	58	45	36	30	25	22	17.8	14.9	12.7	11.1	9.9	8.9	8.1
	60	0.49	63	49	39	32	28	24	19.4	16.2	13.9	12.1	10.8	9.7	8.8
	75	0.55	70	54	44	36	31	27	22	18.2	15.6	13.6	12.1	10.9	9.9
90	0.60	77	59	48	40	34	30	24	19.8	17.0	14.9	13.2	11.9	10.8	
05	15	0.31	40	31	25	20	17.5	15.3	12.3	10.2	8.8	7.7	6.8	6.1	5.6
	20	0.35	45	35	28	23	19.8	17.3	13.9	11.6	9.9	8.7	7.7	6.9	6.3
	30	0.43	55	43	34	28	24	21	17.0	14.2	12.2	10.6	9.5	8.5	7.7
	40	0.50	64	50	40	33	28	25	19.8	16.5	14.1	12.4	11.0	9.9	9.0
	50	0.56	72	55	44	37	32	28	22	18.5	15.8	13.9	12.3	11.1	10.1
	60	0.61	78	60	48	40	35	30	24	20	17.3	15.1	13.4	12.1	11.0
	75	0.68	87	67	54	45	38	34	27	22	19.2	16.8	15.0	13.5	12.2
90	0.75	96	74	59	50	42	37	30	25	21	18.6	16.5	14.9	13.5	
06	15	0.37	47	37	29	24	21	18.3	14.7	12.2	10.5	9.2	8.1	7.3	6.7
	20	0.42	54	42	33	28	24	21	16.6	13.9	11.9	10.4	9.2	8.3	7.6
	30	0.52	67	51	41	34	29	26	21	17.2	14.7	12.9	11.4	10.3	9.4
	40	0.60	77	59	48	40	34	30	24	19.8	17.0	14.9	13.2	11.9	10.8
	50	0.67	86	66	53	44	38	33	27	22	19.0	16.6	14.7	13.3	12.1
	60	0.73	93	72	58	48	41	36	29	24	21	18.1	16.1	14.5	13.1
	75	0.82	105	81	65	54	46	41	32	27	23	20	18.0	16.2	14.8
90	0.90	115	89	71	59	51	45	36	30	25	22	19.8	17.8	16.2	
08	15	0.49	63	49	39	32	28	24	19.4	16.2	13.9	12.1	10.8	9.7	8.8
	20	0.57	73	56	45	38	32	28	23	18.8	16.1	14.1	12.5	11.3	10.3
	30	0.69	88	68	55	46	39	34	27	23	19.5	17.1	15.2	13.7	12.4
	40	0.80	102	79	63	53	45	40	32	26	23	19.8	17.6	15.8	14.4
	50	0.89	114	88	70	59	50	44	35	29	25	22	19.6	17.6	16.0
	60	0.98	125	97	78	65	55	49	39	32	28	24	22	19.4	17.6
	75	1.10	141	109	87	73	62	54	44	36	31	27	24	22	19.8
90	1.20	154	119	95	79	68	59	48	40	34	30	26	24	22	
10	15	0.61	78	60	48	40	35	30	24	20	17.3	15.1	13.4	12.1	11.0
	20	0.71	91	70	56	47	40	35	28	23	20	17.6	15.6	14.1	12.8
	30	0.87	111	86	69	57	49	43	34	29	25	22	19.1	17.2	15.7
	40	1.00	128	99	79	66	57	50	40	33	28	25	22	19.8	18.0
	50	1.12	143	111	89	74	63	55	44	37	32	28	25	22	20
	60	1.22	156	121	97	81	69	60	48	40	35	30	27	24	22
	75	1.37	175	136	109	90	78	68	54	45	39	34	30	27	25
90	1.50	192	149	119	99	85	74	59	50	42	37	33	30	27	
15	15	0.92	118	91	73	61	52	46	36	30	26	23	20	18.2	16.6
	20	1.06	136	105	84	70	60	52	42	35	30	26	23	21	19.1
	30	1.30	166	129	103	86	74	64	51	43	37	32	29	26	23
	40	1.50	192	149	119	99	85	74	59	50	42	37	33	30	27
	50	1.68	215	166	133	111	95	83	67	55	48	42	37	33	30
	60	1.84	236	182	146	121	104	91	73	61	52	46	40	36	33
	75	2.05	262	203	162	135	116	101	81	68	58	51	45	41	37
90	2.25	288	223	178	149	127	111	89	74	64	56	50	45	41	
20	15	1.22	156	121	97	81	69	60	48	40	35	30	27	24	22
	20	1.41	180	140	112	93	80	70	56	47	40	35	31	28	25
	30	1.73	221	171	137	114	98	86	69	57	49	43	38	34	31
	40	2.00	256	198	158	132	113	99	79	66	57	50	44	40	36
	50	2.24	287	222	177	148	127	111	89	74	63	55	49	44	40
	60	2.45	314	243	194	162	139	121	97	81	69	61	54	49	44
	75	2.74	351	271	217	181	155	136	109	90	78	68	60	54	49
90	3.00	384	297	238	198	170	149	119	99	85	74				

*Always verify tips or orifices you received are the size which you require before using with chemical. Chemical rates need to be obtained from your chemical dealer.

Technical Information

Universal Application Rate Chart for 30" Tip Spacing

TIP CAPACITY	LIQUID PRESSURE IN PSI	CAPACITY 1 NOZZLE IN GPM	CAPACITY 1 NOZZLE IN OZ./MIN.	GALLONS PER ACRE - 30" NOZZLE SPACING											
				4 MPH	5 MPH	6 MPH	7 MPH	8 MPH	10 MPH	12 MPH	14 MPH	16 MPH	18 MPH	20 MPH	22 MPH
01	15	0.061	7.8	3.0	2.4	2.0	1.7	1.5	1.2	1.0	0.86	0.75	0.67	0.60	0.55
	20	0.071	9.1	3.5	2.8	2.3	2.0	1.8	1.4	1.2	1.0	0.88	0.78	0.70	0.64
	30	0.087	11	4.3	3.4	2.9	2.5	2.2	1.7	1.4	1.2	1.1	0.96	0.86	0.78
	40	0.10	13	5.0	4.0	3.3	2.8	2.5	2.0	1.7	1.4	1.2	1.1	0.99	0.90
	50	0.11	14	5.4	4.4	3.6	3.1	2.7	2.2	1.8	1.6	1.4	1.2	1.1	0.99
	60	0.12	15	5.9	4.8	4.0	3.4	3.0	2.4	2.0	1.7	1.5	1.3	1.2	1.1
	75	0.14	18	6.9	5.5	4.6	4.0	3.5	2.8	2.3	2.0	1.7	1.5	1.4	1.3
90	0.15	19	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1	1.9	1.7	1.5	1.4	
015	15	0.092	12	4.6	3.6	3.0	2.6	2.3	1.8	1.5	1.3	1.1	1.0	0.91	0.83
	20	0.11	14	5.4	4.4	3.6	3.1	2.7	2.2	1.8	1.6	1.4	1.2	1.1	0.99
	30	0.13	17	6.4	5.1	4.3	3.7	3.2	2.6	2.1	1.8	1.6	1.4	1.3	1.2
	40	0.15	19	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1	1.9	1.7	1.5	1.4
	50	0.17	22	8.4	6.7	5.6	4.8	4.2	3.4	2.8	2.4	2.1	1.9	1.7	1.5
	60	0.18	23	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5	2.2	2.0	1.8	1.6
	75	0.21	27	10.4	8.3	6.9	5.9	5.2	4.2	3.5	3.0	2.6	2.3	2.1	1.9
90	0.23	29	11.4	9.1	7.6	6.5	5.7	4.6	3.8	3.3	2.8	2.5	2.3	2.1	
02	15	0.12	15	5.9	4.8	4.0	3.4	3.0	2.4	2.0	1.7	1.5	1.3	1.2	1.1
	20	0.14	18	6.9	5.5	4.6	4.0	3.5	2.8	2.3	2.0	1.7	1.5	1.4	1.3
	30	0.17	22	8.4	6.7	5.6	4.8	4.2	3.4	2.8	2.4	2.1	1.9	1.7	1.5
	40	0.20	26	9.9	7.9	6.6	5.7	5.0	4.0	3.3	2.8	2.5	2.2	2.0	1.8
	50	0.22	28	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1	2.7	2.4	2.2	2.0
	60	0.24	31	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2
	75	0.27	35	13.4	10.7	8.9	7.6	6.7	5.3	4.5	3.8	3.3	3.0	2.7	2.4
90	0.30	38	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	2.7	
025	15	0.15	19	7.4	5.9	5.0	4.2	3.7	3.0	2.5	2.1	1.9	1.7	1.5	1.4
	20	0.18	23	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5	2.2	2.0	1.8	1.6
	30	0.22	28	10.9	8.7	7.3	6.2	5.4	4.4	3.6	3.1	2.7	2.4	2.2	2.0
	40	0.25	32	12.4	9.9	8.3	7.1	6.2	5.0	4.1	3.5	3.1	2.8	2.5	2.3
	50	0.28	36	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0	3.5	3.1	2.8	2.5
	60	0.31	40	15.3	12.3	10.2	8.8	7.7	6.1	5.1	4.4	3.8	3.4	3.1	2.8
	75	0.34	44	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1
90	0.38	49	18.8	15.0	12.5	10.7	9.4	7.5	6.3	5.4	4.7	4.2	3.8	3.4	
03	15	0.18	23	8.9	7.1	5.9	5.1	4.5	3.6	3.0	2.5	2.2	2.0	1.8	1.6
	20	0.21	27	10.4	8.3	6.9	5.9	5.2	4.2	3.5	3.0	2.6	2.3	2.1	1.9
	30	0.26	33	12.9	10.3	8.6	7.4	6.4	5.1	4.3	3.7	3.2	2.9	2.6	2.3
	40	0.30	38	14.9	11.9	9.9	8.5	7.4	5.9	5.0	4.2	3.7	3.3	3.0	2.7
	50	0.34	44	16.8	13.5	11.2	9.6	8.4	6.7	5.6	4.8	4.2	3.7	3.4	3.1
	60	0.37	47	18.3	14.7	12.2	10.5	9.2	7.3	6.1	5.2	4.6	4.1	3.7	3.3
	75	0.41	52	20	16.2	13.5	11.6	10.1	8.1	6.8	5.8	5.1	4.5	4.1	3.7
90	0.45	58	22	17.8	14.9	12.7	11.1	8.9	7.4	6.4	5.6	5.0	4.5	4.1	
04	15	0.24	31	11.9	9.5	7.9	6.8	5.9	4.8	4.0	3.4	3.0	2.6	2.4	2.2
	20	0.28	36	13.9	11.1	9.2	7.9	6.9	5.5	4.6	4.0	3.5	3.1	2.8	2.5
	30	0.35	45	17.3	13.9	11.6	9.9	8.7	6.9	5.8	5.0	4.3	3.9	3.5	3.2
	40	0.40	51	19.8	15.8	13.2	11.3	9.9	7.9	6.6	5.7	5.0	4.4	4.0	3.6
	50	0.45	58	22	17.8	14.9	12.7	11.1	8.9	7.4	6.4	5.6	5.0	4.5	4.1
	60	0.49	63	24	19.4	16.2	13.9	12.1	9.7	8.1	6.9	6.1	5.4	4.9	4.4
	75	0.55	70	27	22	18.2	15.6	13.6	10.9	9.1	7.8	6.8	6.1	5.4	5.0
90	0.60	77	30	24	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.4	
05	15	0.31	40	15.3	12.3	10.2	8.8	7.7	6.1	5.1	4.4	3.8	3.4	3.1	2.8
	20	0.35	45	17.3	13.9	11.6	9.9	8.7	6.9	5.8	5.0	4.3	3.9	3.5	3.2
	30	0.43	55	21	17.0	14.2	12.2	10.6	8.5	7.1	6.1	5.3	4.7	4.3	3.9
	40	0.50	64	25	19.8	16.5	14.1	12.4	9.9	8.3	7.1	6.2	5.5	5.0	4.5
	50	0.56	72	28	22	18.5	15.8	13.9	11.1	9.2	7.9	6.9	6.2	5.5	5.0
	60	0.61	78	30	24	20	17.3	15.1	12.1	10.1	8.6	7.5	6.7	6.0	5.5
	75	0.68	87	34	27	22	19.2	16.8	13.5	11.2	9.6	8.4	7.5	6.7	6.1
90	0.75	96	37	30	25	21	18.6	14.9	12.4	10.6	9.3	8.3	7.4	6.8	
06	15	0.37	47	18.3	14.7	12.2	10.5	9.2	7.3	6.1	5.2	4.6	4.1	3.7	3.3
	20	0.42	54	21	16.6	13.9	11.9	10.4	8.3	6.9	5.9	5.2	4.6	4.2	3.8
	30	0.52	67	26	21	17.2	14.7	12.9	10.3	8.6	7.4	6.4	5.7	5.1	4.7
	40	0.60	77	30	24	19.8	17.0	14.9	11.9	9.9	8.5	7.4	6.6	5.9	5.4
	50	0.67	86	33	27	22	19.0	16.6	13.3	11.1	9.5	8.3	7.4	6.6	6.0
	60	0.73	93	36	29	24	21	18.1	14.5	12.0	10.3	9.0	8.0	7.2	6.6
	75	0.82	105	41	32	27	23	20	16.2	13.5	11.6	10.1	9.0	8.1	7.4
90	0.90	115	45	36	30	25	22	17.8	14.9	12.7	11.1	9.9	8.9	8.1	
08	15	0.49	63	24	19.4	16.2	13.9	12.1	9.7	8.1	6.9	6.1	5.4	4.9	4.4
	20	0.57	73	28	23	18.8	16.1	14.1	11.3	9.4	8.1	7.1	6.3	5.6	5.1
	30	0.69	88	34	27	23	19.5	17.1	13.7	11.4	9.8	8.5	7.6	6.8	6.2
	40	0.80	102	40	32	26	23	19.8	15.8	13.2	11.3	9.9	8.8	7.9	7.2
	50	0.89	114	44	35	29	25	22	17.6	14.7	12.6	11.0	9.8	8.8	8.0
	60	0.98	125	49	39	32	28	24	19.4	16.2	13.9	12.1	10.8	9.7	8.8
	75	1.10	141	54	44	36	31	27	22	18.2	15.6	13.6	12.1	10.9	9.9
90	1.20	154	59	48	40	34	30	24	19.8	17.0	14.9	13.2	11.9	10.8	
10	15	0.61	78	30	24	20	17.3	15.1	12.1	10.1	8.6	7.5	6.7	6.0	5.5
	20	0.71	91	35	28	23	20	17.6	14.1	11.7	10.0	8.8	7.8	7.0	6.4
	30	0.87	111	43	34	29	25	22	17.2	14.4	12.3	10.8	9.6	8.6	7.8
	40	1.00	128	50	40	33	28	25	19.8	16.5	14.1	12.4	11.0	9.9	9.0
	50	1.12	143	55	44	37	32	28	22	18.5	15.8	13.9	12.3	11.1	10.1
	60	1.22	156	60	48	40	35	30	24	20	17.3	15.1	13.4	12.1	11.0
	75	1.37	175	68	54	45	39	34	27	23	19.4	17.0	15.1	13.6	12.3
90	1.50	192	74	59	50	42	37	30	25	21	18.6	16.5	14.9	13.5	
15	15	0.92	118	46	36	30	26	23	18.2	15.2	13.0	11.4	10.1	9.1	8.3
	20	1.06	136	52	42	35	30	26	21	17.5	15.0	13.1	11.7	10.5	9.5
	30	1.30	166	64	51	43	37	32	26	21	18.4	16.1	14.3	12.9	11.7
	40	1.50	192	74	59	50	42	37	30	25	21	18.6	16.5	14.9	13.5
	50	1.68	215	83	67	55	48	42	33	28	24	21	18.5	16.6	15.1
	60	1.84	236	91	73	61	52	46	36	30	26	23	20	18.2	16.6
	75	2.05	262	101	81	68	58	51	41	34	29	25	23	20	18.5
90	2.25	288	111	89	74	64	56	45	37	32	28	25	22	20	
20	15	1.22	156	60	48	40	35	30	24	20	17.3	15.1	13.4	12.1	11.0
	20	1.41	180	70	56	47	40	35	28	23	19.9	17.4	15.5	14.0	12.7
	30	1.73	221	86	69	57	49	43	34	29	24	21	19.0	17.1	15.6
	40	2.00	256	99	79	66	57	50	40	33	28	25	22	19.8	18.0
	50	2.24	287	111	89	74	63	55	44	37	32	28	25	22	20
	60	2.45	314	121	97	81	6								

Technical Information

Useful Formulas

$$\text{GPM (Per Nozzle)} = \frac{\text{GPA} \times \text{MPH} \times \text{W}}{5,940}$$

$$\text{GPM (Per Nozzle)} = \frac{\text{GAL}/1000\text{FT}^2 \times \text{MPH} \times \text{W}}{136}$$

$$\text{GPA} = \frac{5,940 \times \text{GPM (Per Nozzle)}}{\text{MPH} \times \text{W}}$$

$$\text{GAL}/1000\text{FT}^2 = \frac{136 \times \text{GPM (Per Nozzle)}}{\text{MPH} \times \text{W}}$$

GPM – Gallons Per Minute

GPA – Gallons Per Acre

GAL/1000FT² – Gallons Per 1000 Square Feet

MPH – Miles Per Hour

W – Nozzle spacing (in inches) for broadcast spraying

– Spray width (in inches) for single nozzle, band spraying or boomless spraying

– Row spacing (in inches) divided by the number of nozzles per row for directed spraying

Nozzle Spacing

If the nozzle spacing on your boom is different than those tabulated, multiply the tabulated GPA coverages by one of the following factors.

20°	
OTHER SPACING (INCHES)	CONVERSION FACTOR
8	2.5
10	2
12	1.67
14	1.43
16	1.25
18	1.11
22	.91
24	.83
30	.66

Useful Formulas for Roadway Applications

$$\text{GPLM} = \frac{60 \times \text{GPM}}{\text{MPH}} \quad \text{GPM} = \frac{\text{GPLM} \times \text{MPH}}{60}$$

GPLM = Gallons Per Lane Mile

Note: GPLM is not a normal volume per unit area measurement. It is a volume per distance measurement. Increases or decreases in lane width (swath width) are not accommodated by these formulas.

Measuring Travel Speed

Measure a test course in the area to be sprayed or in an area with similar surface conditions. Minimum lengths of 100 and 200 feet are recommended for measuring speeds up to 5 and 10 MPH, respectively. Determine the time required to travel the test course. To help ensure accuracy, conduct the speed check with a partially loaded (about half full) sprayer and select the engine throttle setting and gear that will be used when spraying. Repeat the above process and average the times that were measured. Use the following equation or the table at right to determine ground speed.

$$\text{Speed (MPH)} = \frac{\text{Distance (FT)} \times 60}{\text{Time (seconds)} \times 88}$$

Speeds

SPEED IN MPH	TIME REQUIRED IN SECONDS TO TRAVEL A DISTANCE OF:		
	100 Feet	200 Feet	300 Feet
1.0	68	136	205
1.5	45	91	136
2.0	34	68	102
2.5	27	55	82
3.0	23	45	68
3.5	19	39	58
4.0	17	34	51
4.5	15	30	45
5.0	14	27	41
5.5	—	25	37
6.0	—	23	34
6.5	—	21	31
7.0	—	19	29
7.5	—	18	27
8.0	—	17	26
8.5	—	16	24
9.0	—	15	23

30°	
OTHER SPACING (INCHES)	CONVERSION FACTOR
26	1.15
28	1.07
32	.94
34	.88
36	.83
38	.79
40	.75
42	.71
44	.68

40°	
OTHER SPACING (INCHES)	CONVERSION FACTOR
28	1.43
30	1.33
32	1.25
34	1.18
36	1.11
38	1.05
42	.95
44	.91
48	.83

Miscellaneous Conversion Factors

One Acre = 43,560 Square Feet
 = 43.56 1000FT² Blocks
 = 0.405 Hectare

One Hectare = 2.471 Acres

One Gallon Per Acre
 = 2.9 Fluid Ounces per 1000FT²
 = 9.35 Liters Per Hectare

One Gallon Per 1000FT² = 43.56 GPA

One Mile = 5,280 Feet
 = 1,610 Meters
 = 1.61 Kilometers



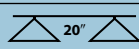
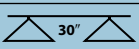
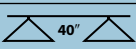
One Gallon = 128 Fluid Ounces
 = 8 Pints
 = 4 Quarts
 = 3.79 Liters
 = 0.83 Imperial Gallon

One Pound Per Square Inch
 = 0.069 bar
 = 6.896 Kilopascals

One Mile Per Hour = 1.609 Kilometers Per Hour

Suggested Minimum Spray Heights

The nozzle height suggestions in the table below are based on the minimum overlap required to obtain uniform distribution. However, in many cases, typical height adjustments are based on a 1 to 1 nozzle spacing to height ratio. For example, 110° flat spray tips spaced 20 inches apart are commonly set 20 inches above the target.

	(Inches)			
				
TeeJet® Standard, TJ	65°	22–24"	33–35"	NR*
TeeJet, XR, TX, DG, TJ	80°	17–19"	26–28"	NR*
TeeJet, XR, DG, TT, TTI, TJ, DGTJ, AI, AIXR	110°	16–18"	20–22"	NR*
FulJet®	120°	10–18"***	14–18"***	14–18"***
FloodJet® TK, TF	120°	14–16"****	15–17"****	18–20"****

* Not recommended.

** Nozzle height based on 30° to 45° angle of orientation (see page 30 of catalog).

*** Wide angle spray tip height is influenced by nozzle orientation. The critical factor is to achieve a double spray pattern overlap.

Technical Information

Spraying Liquids with a Density Other Than Water

Since all the tabulations in this catalog are based on spraying water, which weighs 8.34 lbs. per USA gallon, conversion factors must be used when spraying liquids that are heavier or lighter than water. To determine the proper size nozzle for the liquid to be sprayed, first multiply the desired GPM or GPA of liquid by the water rate conversion factor. Then use the new converted GPM or GPA rate to select the proper size nozzle.

Example:

Desired application rate is 20 GPA of 28%N. Determine the correct nozzle size as follows:

$$\text{GPA (liquid other than water)} \times \text{Conversion Factor} = \text{GPA (from table in catalog)}$$

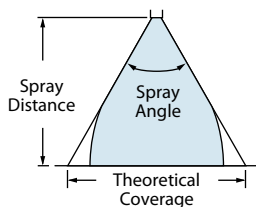
$$20 \text{ GPA (28\%)} \times 1.13 = 22.6 \text{ GPA (water)}$$

The applicator should choose a nozzle size that will supply 22.6 GPA of water at the desired pressure.

WEIGHT OF SOLUTION	SPECIFIC GRAVITY	CONVERSION FACTOR
7.0 lbs./gal.	.84	.92
8.0 lbs./gal.	.96	.98
8.34 lbs./gal.	1.00 – WATER	1.00
9.0 lbs./gal.	1.08	1.04
10.0 lbs./gal.	1.20	1.10
10.65 lbs./gal.	1.28 – 28% nitrogen	1.13
11.0 lbs./gal.	1.32	1.15
12.0 lbs./gal.	1.44	1.20
14.0 lbs./gal.	1.68	1.30

Spray Coverage Information

This table lists the theoretical coverage of spray patterns as calculated from the included spray angle of the spray and the distance from the nozzle orifice. These values are based on the assumption that the spray angle remains the same throughout the entire spray distance. In actual practice, the tabulated spray angle does not hold for long spray distances.

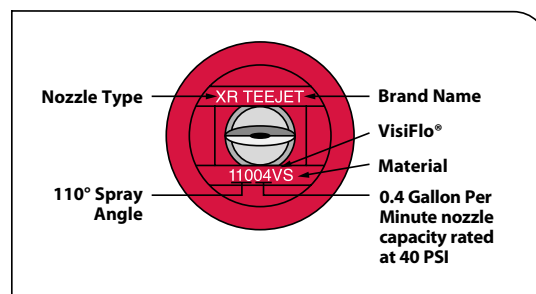


INCLUDED SPRAY ANGLE	THEORETICAL COVERAGE AT VARIOUS SPRAY HEIGHTS (IN INCHES)							
	8"	10"	12"	15"	18"	24"	30"	36"
15°	2.1	2.6	3.2	3.9	4.7	6.3	7.9	9.5
20°	2.8	3.5	4.2	5.3	6.4	8.5	10.6	12.7
25°	3.5	4.4	5.3	6.6	8.0	10.6	13.3	15.9
30°	4.3	5.4	6.4	8.1	9.7	12.8	16.1	19.3
35°	5.0	6.3	7.6	9.5	11.3	15.5	18.9	22.7
40°	5.8	7.3	8.7	10.9	13.1	17.5	21.8	26.2
45°	6.6	8.3	9.9	12.4	14.9	19.9	24.8	29.8
50°	7.5	9.3	11.2	14.0	16.8	22.4	28.0	33.6
55°	8.3	10.3	12.5	15.6	18.7	25.0	31.2	37.5
60°	9.2	11.5	13.8	17.3	20.6	27.7	34.6	41.6
65°	10.2	12.7	15.3	19.2	22.9	30.5	38.2	45.8
73°	11.8	14.8	17.8	22.0	27.0	36.0	44.0	53.0
80°	13.4	16.8	20.2	25.2	30.3	40.3	50.4	60.4
85°	14.7	18.3	22.0	27.5	33.0	44.0	55.4	66.4
90°	16.0	20.0	24.0	30.0	36.0	48.0	60.0	72.0
95°	17.5	21.8	26.2	32.8	40.3	52.4	65.5	78.6
100°	19.1	23.8	28.6	35.8	43.0	57.2	71.6	85.9
110°	22.8	28.5	34.3	42.8	51.4	68.5	85.6	103
120°	27.7	34.6	41.6	52.0	62.4	83.2	104	
130°	34.3	42.9	51.5	64.4	77.3	103		
140°	43.8	54.8	65.7	82.2	98.6			
150°	59.6	74.5	89.5					

Nozzle Nomenclature

There are many types of nozzles available, with each providing different flow rates, spray angles, droplet sizes and patterns. Some of these spray tip characteristics are indicated by the tip number.

Remember, when replacing tips, be sure to purchase the same tip number, thereby ensuring your sprayer remains properly calibrated.



Information About Spray Pressure

Flow Rate

Nozzle flow rate varies with spraying pressure. In general, the relationship between GPM and pressure is as follows:

$$\frac{GPM_1}{GPM_2} = \frac{\sqrt{PSI_1}}{\sqrt{PSI_2}}$$

This equation is explained by the illustration to the right. Simply stated, in order to double the flow through a nozzle, the pressure must be increased four times.

Higher pressure not only increases the flow rate through a nozzle, but it also influences the droplet size and the rate of orifice wear. As pressure is increased, the droplet size decreases and the rate of orifice wear increases.

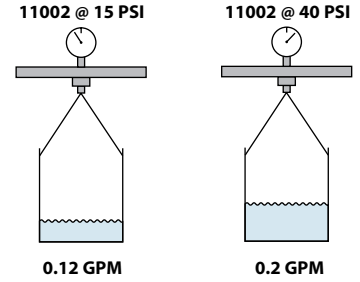
The values given in the tabulation sections of this catalog indicate the most commonly used pressure ranges for the associated spray tips. When information on the performance of spray tips outside of the pressure range given in this catalog is required, contact the Agricultural Division at Spraying Systems Co.®

Spray Angle and Coverage

Depending on the nozzle type and size, the operating pressure can have a significant effect on spray angle and quality of spray distribution. As shown here for an 11002 flat spray tip, lowering the pressure results in a smaller spray angle and a significant reduction in spray coverage.

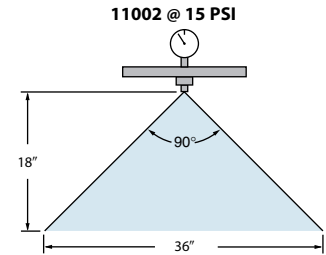
Tabulations for spray tips in this catalog are based on spraying water. Generally, liquids more viscous than water produce relatively smaller spray angles, while liquids with surface tensions lower than water will produce wider spray angles. In situations where the uniformity of spray distribution is important, be careful to operate your spray tips within the proper pressure range.

Note: Suggested minimum spray heights for broadcast spraying are based upon nozzles spraying water at the rated spray angle.

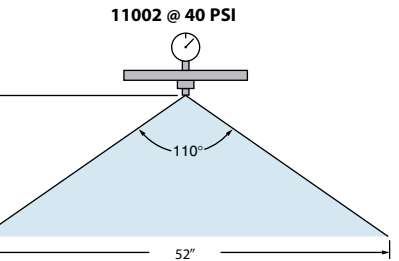


0.12 GPM

0.2 GPM



11002 @ 15 PSI



11002 @ 40 PSI

Pressure Drop Through Sprayer Components

COMPONENT NUMBER	TYPICAL PRESSURE DROP (PSI) AT VARIOUS FLOW RATES (GPM)									
	3 GPM	5 GPM	7 GPM	8 GPM	9 GPM	10 GPM	15 GPM	18 GPM	32 GPM	
AA2 GunJet®	2.0	5.3	10.0		16.0					
AA18 GunJet	5.0	13.0	25.0		40.0					
AA30L GunJet		14.0								
AA43 GunJet		1.0	2.0							
AA143 GunJet		0.9	1.7			3.5	7.9			
AA6B Valve		0.5	1.2	1.7	2.2	2.9	7.8	12.2		
AA17 Valve		1.5	2.5	3.5	4.0	5.0	11.5	16.0		
AA144A Valve		1.5	2.5	3.5	4.0	5.0	11.5	16.0		
AA144A-1-3 Valve				5.0						
AA145 Valve								5.0		
344BEC-24-C Valve									5.0	

Pressure Drop Through Various Hose Sizes

FLOW IN GPM	PRESSURE DROP IN PSI (10' [3 m] LENGTH WITHOUT COUPLINGS)				
	¼" I.D.	⅜" I.D.	½" I.D.	¾" I.D.	1" I.D.
0.5	1.4	.2			
1.0		.7			
1.5		1.4	.4		
2.0		2.4	.6		
2.5		3.4	.9		
3.0			1.2		
4.0			2.0		
5.0			2.9	.4	
6.0			4.0	.6	
8.0				.9	.3
10.0				1.4	.4