

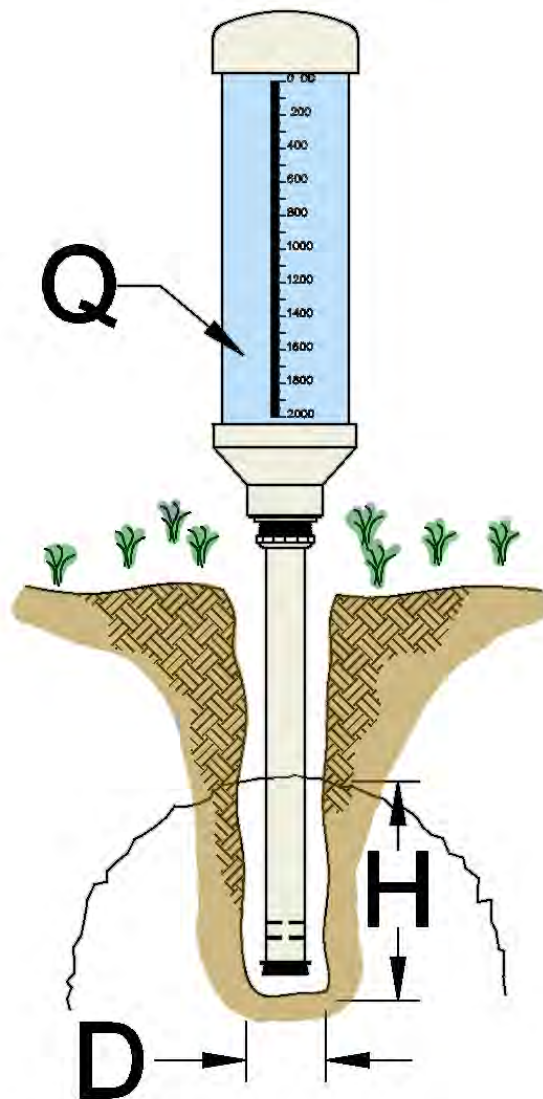


AMERICAN
Manufacturing Company, Inc.

PERM-IT™

SHALLOW – SLOW RATE – CONSTANT HEAD – INVERTED

PERMEAMETER



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Various equations and approaches are available for determining **K_{SAT}** by constant head permeameter (Amoozegar and others). The Glover solution, which was developed over 40 years ago, considers only the saturated flow that occurs around the auger hole (Zangar, 1953).

Determining the **K_{SAT}** value of a particular soil is not the only loading rate determining factor for a site. Other site evaluation characteristics are very important including landscape position, contour, and current soil science evaluation procedures. The **K_{SAT}** value should only be used to confirm soils evaluation results to help define the structure of the soil.

The Glover solution; **KSAT** = $Q[\sinh^{-1}(H/r) - \{(r/H)^2 + 1\}^{1/2} + r/H] / 2\pi H^2$

KSAT	cm/day
H	height of water (cm) in auger hole (constant head)
r	radius of auger hole (cm)
Q	flow into auger hole (cc/day)

SOIL PERMEAMETER MEASURING DEVICE OPERATING INSTRUCTIONS

1. Loosen gland and release the small diameter tube.
2. Auger hole to desired depth. The depth must not exceed capacity of permeameter.
3. If necessary, unglaze auger hole.
4. Fill permeameter with water.
5. Invert the device and rapidly insert into hole.
6. After the rate stabilizes (cc/min going down the scale) read the scale.
7. Record scale reading every 5 minutes.
8. After three readings are the same, record the value.
9. Go to chart and with the auger size, depth of head, and consistent reading, read **KSAT** value.
10. Repeat with other holes in designated area.

NOTE:

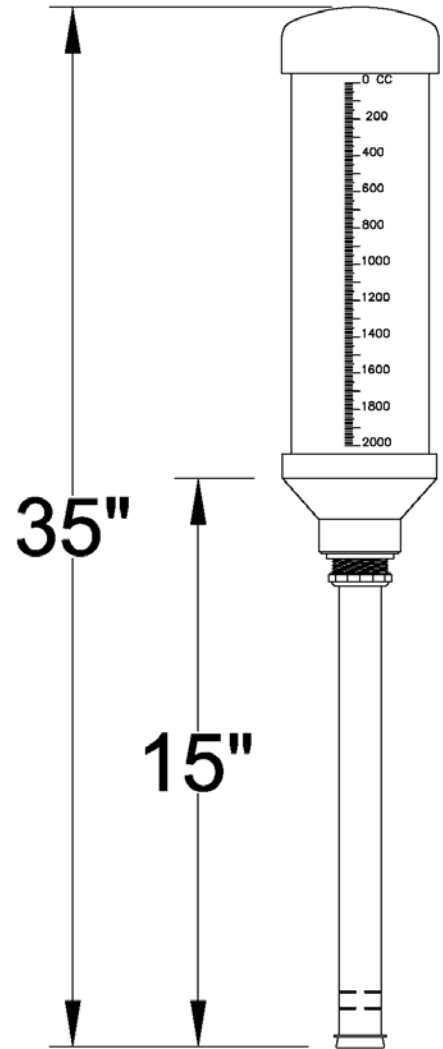
The use of this device is suggested only to confirm structure of soil.

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HYDRAULIC CONDUCTIVITY – Glover solution (ref. Amoozegar)

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>
Auger Size - Dia.	3.25	3	3	2
Water Height - H	8	8	4	8
Q	K _{SAT}	K _{SAT}	K _{SAT}	K _{SAT}
cc/min	cm/day	cm/day	cm/day	cm/day
2	1.64	1.72	4.50	2.10
4	3.29	3.43	9.01	4.20
6	4.93	5.15	13.51	6.31
8	6.57	6.86	18.02	8.41
10	8.21	8.58	22.52	10.51
12	9.86	10.30	27.03	12.61
14	11.50	12.01	31.53	14.72
16	13.14	13.73	36.04	16.82
18	14.79	15.44	40.54	18.92
20	16.43	17.16	45.04	21.02
22	18.07	18.88	49.55	23.12
24	19.71	20.59	54.05	25.23
26	21.36	22.31	58.56	27.33
28	23.00	24.03	63.06	29.43
30	24.64	25.74	67.57	31.53
32	26.29	27.46	72.07	33.64
34	27.93	29.17	76.58	35.74
36	29.57	30.89	81.08	37.84
38	31.22	32.61	85.58	39.94
40	32.86	34.32	90.09	42.04
42	34.5	36.04	94.59	44.15
44	36.14	37.75	99.10	46.25
46	37.79	39.47	103.6	48.35
48	39.43	41.19	108.11	50.45
50	41.07	42.90	112.61	52.56
52	42.72	44.62	117.11	54.66
54	44.36	46.33	121.62	56.76
56	46.00	48.05	126.12	58.86
58	47.64	49.77	130.63	60.96
60	49.29	51.48	135.13	63.07
62	50.93	53.20	139.64	65.17
64	52.57	54.91	144.14	67.27
66	54.22	56.63	148.65	69.37
68	55.86	58.35	153.15	71.47
70	57.50	60.06	157.65	73.58
72	59.14	61.78	162.16	75.68



LOADING RATE CHART

LOADING RATE CHART FOR PERC. VALUES TO 120 MPI & KSAT TO 2.2 cm/day

Ksat cm/day	Perc Rate min/in.	Gravity ft ² /100 gal Trench Bot.	LPD ft ² /100 gal Trench Bot.	DRIP gpd/Ft ² Area	DRIP gpd/LF Tubing	DRIP in/wk Area
>50	5	110	110	0.4	0.8	4.5
25 - 50	10	120	120			
17.4 - 25.0	15	132	132	0.3	0.6	3.4
15.9 - 17.4	20	146	146			
14.6 - 15.9	25	158	158	0.23	0.46	2.6
13.3 - 14.6	30	174	164			
12.0 - 13.3	35	191	170			
11.0 - 12.0	40	209	176			
10.0 - 11.0	45	229	185	0.2	0.4	2.2
9.1 - 10.0	50	251	193			
8.3 - 9.1	55	275	206	0.178	0.36	2
7.6 - 8.3	60	302	217			
6.9 - 7.6	65	331	228			
6.4 - 6.9	70	363	240	0.15	0.3	1.7
5.8 - 6.4	75	398	251			
5.2 - 5.8	80	437	262			
4.8 - 5.2	85	479	273			
4.4 - 4.8	90	525	284	0.125	0.25	1.4
4.0 - 4.4	95	575	288			
3.6 - 4.0	100	631	316			
3.3 - 3.6	105	692	346	0.09	0.18	1
3.0 - 3.3	110	759	379			
2.6 - 3.0	115	832	416			
2.2 - 2.6	120	912	456	0.075	0.15	0.8

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