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# INSTRUCTIONS

## GARDCO DISTRIBUTED PRODUCTS



**DOWNLOAD**  
**Insta Visc Mobile App**  
 Viscosity and Drain Time  
 Calculator



# S90™ Zahn Dip Viscosity Cup #3 Quick Start Manual

Calibrated Viscosity Cups Designed, Produced & Sold by Paul N. Gardner

**SPECIFICATION TABLE**

Cup Number	Seconds Range	Centistoke Range	Midrange Sensitivity (**)	Calibration Oil Number/ Centistokes (*)
1	31 to 60	15 to 78	2.0	G-20/35
2	19 to 60	39 to 238	4.5	G-60/120
3	11 to 60	63 to 604	11.0	G-100/230
4	10 to 60	97 to 899	15.5	G-350/880
5	10 to 60	219 to 1627	27.0	G350/880

(\*) Centistoke values are nominal - Actual values printed on labels  
 (\*\*) Stated as centistokes per second of efflux time.

## INSTRUCTIONS FOR USE

1. Select the proper number cup to be used from the specification table, which is dependent on the expected viscosity range of the material to be measured.
2. Insure that the cup is clean and that there is no residual dried material in or around the orifice. If necessary use a length of nylon fishing line to clean the orifice.
3. Adjust the temperature, if necessary, of the test material.
4. Completely immerse the cup into the material to be measured in a location free from bubbles or foam, holding the cup vertically by means of the stainless steel split key ring.
5. Measure and record the temperature of the material that is encompassed by the cup.
6. Hold cup vertically by inserting index finger into handle ring. In a quick, steady motion, lift the cup out of the sample material, starting the timer when the top edge of the cup breaks the surface. During the flow time, hold the cup no more than 6" above the level of the sample material.
7. Stop the timer when the first definite break in the stream at the base of the cup is observed.
8. Record the number of seconds of efflux time, temperature and the cup number. (Example: No. 2, EZ™ Dip Cup, 35.0 seconds at 25.1°C.) As an option to the preceding step, refer to the conversion table furnished with the cup and as indicated on the following page, determine the centistoke viscosity for the measured efflux time in seconds and record this value and the measured temperature. (Example: 25.3 centistokes at 25.1°C.) Download the Insta-Visc Mobil App to quickly and easily calculate viscosity or draintime.
9. Promptly clean the cup unless it will be used immediately for a rerun of the same material.

## CARE of CUP

S90™ viscosity cups are ruggedly constructed with all parts made of stainless steel, except the nameplate, and will give many years of satisfactory service requiring only thorough cleaning after each use. It is recommended, however, that calibration of the cup be confirmed periodically, or if dropped or otherwise subjected to damage, use the appropriate standard oil selected from the specification table. The listed viscosity value of these oils as shown on the container label is traceable to the National Institute of Standards and Technology.

## CONVERSION FORMULAS - S90 #3 ONLY

Use this formula derived by Paul N. Gardner company research to find viscosity (V) in centistokes when cup efflux time in seconds (T) is known:

$$V = 10.23T - (575 \div T)$$

Use this formula to find cup efflux time in seconds (T) when viscosity (V) in centistokes is known:

$$T = (V + \sqrt{V^2 + 23529}) \div 20.46$$

Results from the above formulas, solved for each tenth of a second within the cup range, are shown on the reverse side of this page. To find centistoke viscosity for a given cup efflux time in seconds, read down the column on the left to find the nearest second. Then, read to the right to the nearest tenth of a second column to find centistoke value. The chart may be read in reverse to find efflux time seconds when viscosity is known.

**S90™ ZAHN VISCOSITY CUP #3  
EFFLUX TIME - CENTISTOKES CONVERSION TABLE©**

10/95	Viscosity in Centistokes									
Seconds	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
10	45	46	48	50	51	53	54	56	57	59
11	60	62	63	65	66	68	69	71	72	73
12	75	76	78	79	80	82	83	85	86	87
13	89	90	91	93	94	96	97	98	100	101
14	102	103	105	106	107	109	110	111	113	114
15	115	116	118	119	120	121	123	124	125	126
16	128	129	130	131	133	134	135	136	138	139
17	140	141	143	144	145	146	147	149	150	151
18	152	153	155	156	157	158	159	161	162	163
19	164	165	166	168	169	170	171	172	174	175
20	176	177	178	179	181	182	183	184	185	186
21	187	189	190	191	192	193	194	195	197	198
22	199	200	201	202	203	205	206	207	208	209
23	210	211	213	214	215	216	217	218	219	220
24	222	223	224	225	226	227	228	229	231	232
25	233	234	235	236	237	238	239	241	242	243
26	244	245	246	247	248	249	251	252	253	254
27	255	256	257	258	259	260	262	263	264	265
28	266	267	268	269	270	271	272	274	275	276
29	277	278	279	280	281	282	283	284	286	287
30	288	289	290	291	292	293	294	295	296	297
31	299	300	301	302	303	304	305	306	307	308
32	309	310	312	313	314	315	316	317	318	319
33	320	321	322	323	324	326	327	328	329	330
34	331	332	333	334	335	336	337	338	339	341
35	342	343	344	345	346	347	348	349	350	351
36	352	353	354	356	357	358	359	360	361	362
37	363	364	365	366	367	368	369	370	371	373
38	374	375	376	377	378	379	380	381	382	383
39	384	385	386	387	388	390	391	392	393	394
40	395	396	397	398	399	400	401	402	403	404
41	405	406	408	409	410	411	412	413	414	415
42	416	417	418	419	420	421	422	423	424	425
43	427	428	429	430	431	432	433	434	435	436
44	437	438	439	440	441	442	443	444	445	447
45	448	449	450	451	452	453	454	455	456	457
46	458	459	460	461	462	463	464	465	466	468
47	469	470	471	472	473	474	475	476	477	478
48	479	480	481	482	483	484	485	486	487	488
49	490	491	492	493	494	495	496	497	498	499
50	500	501	502	503	504	505	506	507	508	509
51	510	512	513	514	515	516	517	518	519	520
52	521	522	523	524	525	526	527	528	529	530
53	531	532	533	534	536	537	538	539	540	541
54	542	543	544	545	546	547	548	549	550	551
55	552	553	554	555	556	557	558	559	561	562
56	563	564	565	566	567	568	569	570	571	572
57	573	574	575	576	577	578	579	580	581	582
58	583	584	586	587	588	589	590	591	592	593
59	594	595	596	597	598	599	600	601	602	603
60	604	605	606	607	608	609	610	611	613	614

Example: 36.4 Seconds = 357 Centistokes.

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