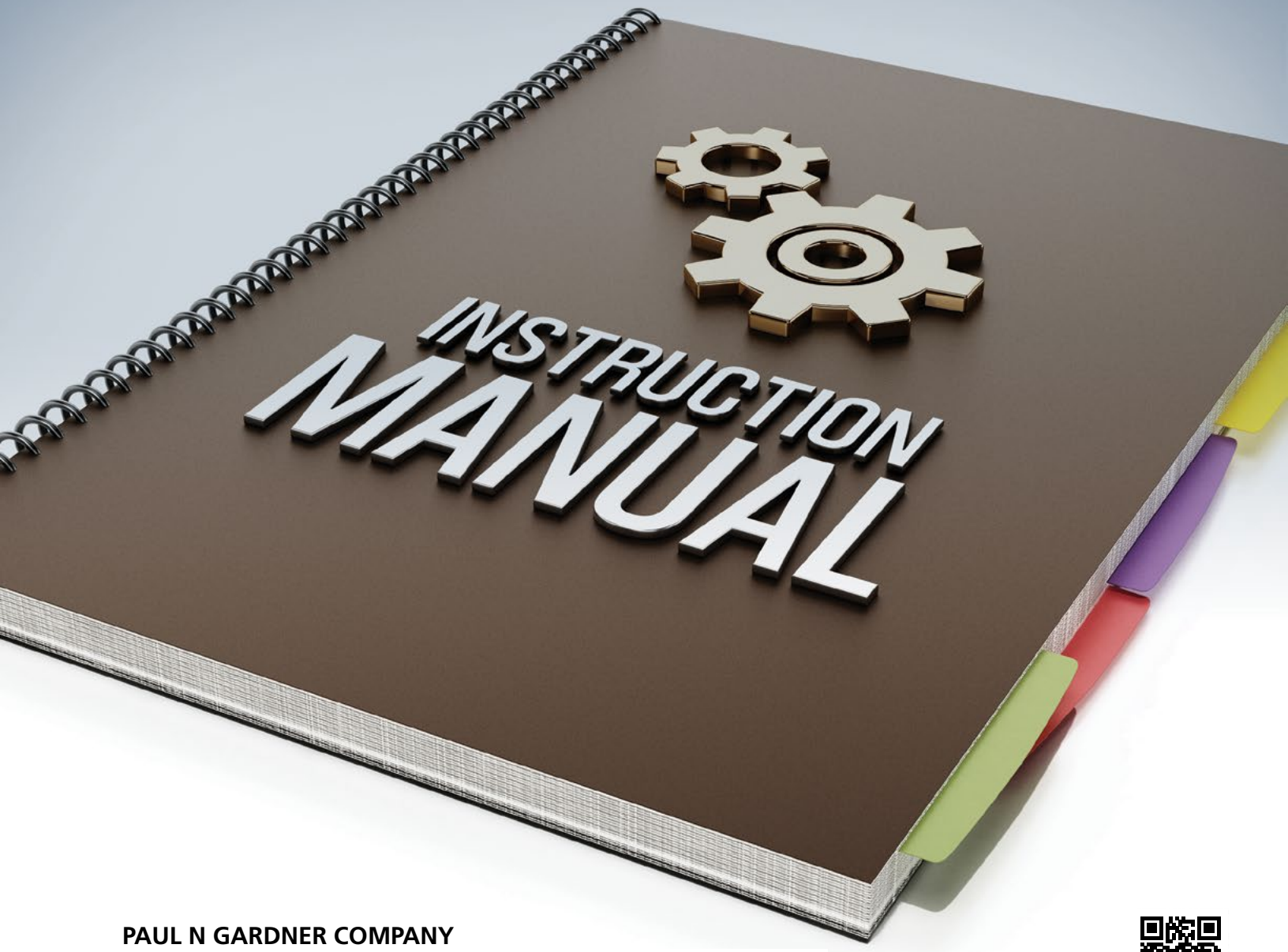

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INSTRUCTIONS

GARDCO DISTRIBUTED PRODUCTS

S90™ Zahn Dip Viscosity Cups 1-5
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 / 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 above, 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 efflux 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, S90™ Dip Cup, 45.0 seconds at 25.1°C.) Download the GARDCO Viscosity Calculator Mobile App to quickly and easily calculate viscosity or drain time, and also note/record your measured temperature.
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.

For Excel Viscosity Chart go to : **https://media.byk-instruments.com/png/files/downloads/ViscosityChart.xlsx**

CONVERSION FORMULAS derived by Paul N. Gardner Company research

(S90 #1 ONLY)

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

V = 1.59T - 1070 ÷ T

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

T = (V + √ (V2 + 6805)) ÷ 3.18

(S90 #2 ONLY)

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

V = 4.18T - 760 ÷ T

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

T = (V + √ (V2 +12707)) ÷ 8.36

(S90 #3 ONLY)

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

V = 10.23T - 575 ÷ T

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

T = (V + √ (V2 + 23529)) ÷ 20.46

(S90 #4 ONLY)

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

V = 15.13T - 545 ÷ T

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

T = (V + √ (V2 + 32983)) ÷ 30.26

(S90 #5 ONLY)

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

V = 27.27T - 540 ÷ T

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

T = (V + √ (V2 + 58903)) ÷ 54.54

Results from the above formulas, solved for each tenth of a second within the cup range.

DOWNLOAD
Viscosity Calculator
Mobile App
Viscosity & Drain Time Calculator

GARDCO Viscosity Calculator App

GARDCO Viscosity Calculator App, previously known as Insta-Visc app, is a viscosity and drain time calculator. It is easy to use, has fast calculations, and there are 52 viscosity cups to choose from.

Just download our FREE mobile app to quickly and easily calculate the kinematic viscosity or drain time of your Gardco and BYK viscosity cups or you can click the link below to use the desktop version.

Simply input either a drain time or viscosity into one of the given input fields and then select the type of viscosity cup you are working with to calculate the viscosity or drain time of your sample.

If the selected cup is highlighted in green that means you are within the cups viscosity range and the number is valid. If you are outside of the cups range an error message will appear, meaning you are outside the tolerance range of that given cup. If this appears please use a different cup that would be in range for what you would like to test.

You can see what cups are in range for your desired value by inputting the value you want to test and scrolling through the list, any cup in green will be able to provide a valid measurement for the desired input.