


**UNION
CARBIDE**

STANDARD TESTING METHOD

Book

DETERMINATION OF FINENESS OF GRIND OF VINYL DISPERSION RESIN WITH THE HEGMAN GAGE

METHOD NUMBER

WC-101-G

1 PURPOSE AND LIMITATIONS

This method describes a procedure for determination of the coarse and hard particles in a vinyl dispersion resin by means of a Hegman Fineness of Grind Gage. This method indicates the approximate size and number of unground particles but not the average size of resin particles in the dispersion from the deep end (0.004 inch) of the tapered channel to the shallow end. Observations are made of the particles which cause imperfections in the smooth film surface and of scratches which appear through the dispersion film. Care should be taken to avoid interference from dust or lint on the surface of the sample or on the surface of the gage and from small air bubbles in the dispersion.

The hard particles reading is reported in terms of "North Standards (NS)", which corresponds to zero at a channel depth of 0.004 inch and to 8 at zero inch. The coarse particle reading is reported in terms of the number of particles which occur within a designated area of the gage.

When both the scratch and count readings are to be obtained, the scratch reading should be obtained first and then the count reading. A delay in reading the scratch reading can permit the dispersion to flow together and obliterate the scratch. The count reading of a plastisol is not significantly affected by time. If a dispersion containing volatiles is tested, unusual delay in reading should be avoided.

2 EQUIPMENT

- (a) Fineness of Grind Gage (Hegman, two parallel paths 5 1/4 inch long by 1/2 inches wide with channel depth from 0.000 inches to 0.004 inches) with scraper, available from the Precision Gage and Tool Company, 320 East Third Street, Dayton, Ohio.
- (b) Desk lamp w/magnifying lens (Dazor Mfg. Corp., St. Louis, Mo.; Model M-270).
- (c) Vacuum pump capable of pulling approximately 10 mm of mercury.

3 PROCEDURE

- (a) Prepare a dispersion of the sample according to Plastics Standard Testing Method WC-320-D or follow specified instruction for preparing organosols.
- (b) Deaerate the plastisol under vacuum for approximately 15 minutes.

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- (c) Pour approximately 1/4 gm of the deaerated sample dispersion into the deep end of each clean gage channel of the Fineness of Grind Gage.
- (d) Holding the clean scraper blade perpendicular to the surface and long axis of the gage channel, draw the blade down the length of the gage channel with sufficiently firm pressure to clean the surface of the gage block. The drawdown speed should require about 3 seconds for the 5-inch channel length.
- (e) Scratch Reading - Immediately view the gage. Note the NS gage reading to the nearest 0.1 unit at the point where the fourth scratch, regardless of length, appears along the channel.
- (f) Count Reading - The gage is viewed at a right angle to the axis of the channel and at such an angle from the plane of the gage as to allow the particles on the film surface to be distinguishable when viewed through the magnifying lens of the desk lamp. The reading is obtained by counting the number of particles in a designated North Standard (NS) range on the gage. Care is taken to count all particles visible with an effort taken to distinguish between particles which extend above the film surface sufficient to cast a shadow and those which do not. All particles or imperfections in the film surface not obviously air bubbles or airborne dirt particles are counted.

The count reading is reported as the number of particles in a designated area using the NS scale. From 0 to 50 the actual count is reported. Any count over 50 is reported as greater than 50 (> 50).

- (g) Make four drawdowns, average the results, and report the scratch rating to the nearest 0.5 unit and count rating to the nearest unit. Four drawdowns are required to achieve satisfactory ratings.
- (h) Whenever possible, the use of a single operator to obtain Hegman Count data is recommended.

4 REPORT

- (a) Complete sample identification
- (b) Analyst and date
- (c) Report the scratch reading to the nearest 0.5 NS rating, using the average of four readings.
- (d) Report the count reading as number of particles in a specified NS range as directed in Section 3f, using the average of four readings.

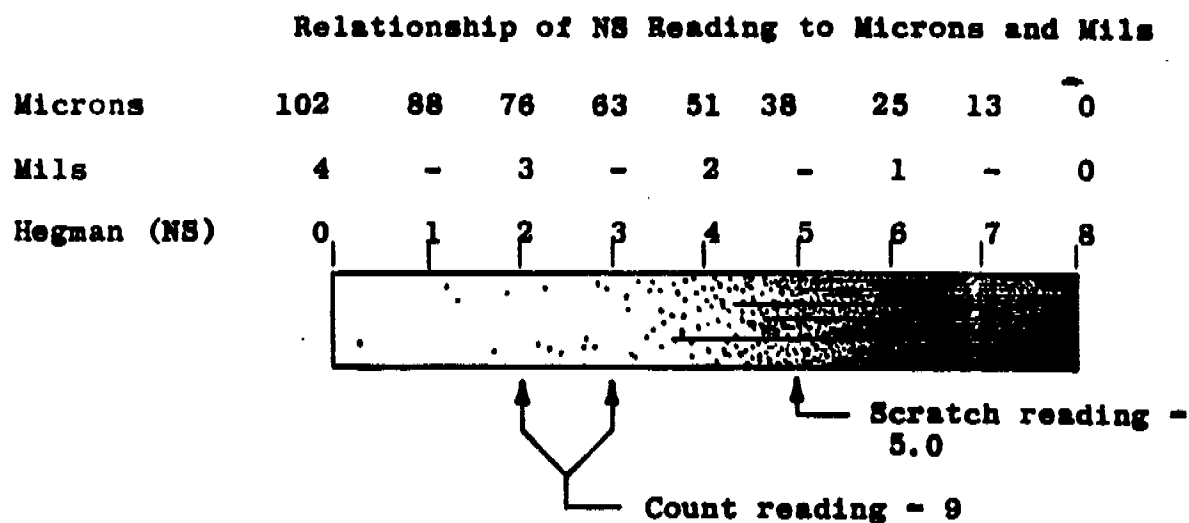


FIGURE 1
READING THE HEGMAN GRIND GAGE