



Standard Test Method for Dispersion Stability of New (Unused) Rolling Oil Dispersions in Water¹

This standard is issued under the fixed designation D3342; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers determination of the dispersion stability of dispersions of rolling oils in water. It is applicable to oils whose water dispersions are stable under moderate agitation, but which show at least some separation upon standing quiescent for ½ h, by rising of the oil particles.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For specific warning statements, see 6.2, A2.1, and A2.5.

2. Referenced Documents

2.1 *ASTM Standards:*²

D1126 Test Method for Hardness in Water

D1293 Test Methods for pH of Water

3. Summary of Test Method

3.1 The rolling oil is dispersed in a standard test water, in a standard container, under standard conditions of time, agitation, and concentration. When the agitation is stopped, the resulting decrease in oil concentration at a specified point near the bottom of the container is measured at certain time intervals and plotted.

4. Significance and Use

4.1 Each steel rolling mill and operation is particular as to the degree of stability of dispersion required to effect maxi-

mum efficiency of lubrication and cooling. This test method is designed to differentiate between coolants for this use. A similar situation is encountered with aluminum rolling mills, but significant differences in designated settling times be required outside the parameter of times used herein. Precision data have only been obtained relative to metastable dispersions for steel mill rolling oils.

5. Apparatus

5.1 *Mixing Beaker*,^{3,4} 5800 mL capacity, made of stainless steel, modified as shown in Annex A2.

5.2 *Combination Agitator and Temperature Control Device*.^{4,5}

5.3 *Babcock Centrifuge Bottles*^{4,6}—The 165-mm cream test bottle, with 5 mL-neck permitting oil concentration readings from 0 to 10 % is preferred. These bottles should be marked for filling to the 50-mL level which will normally be found close to the junction of body and neck. Sulfonation bottles may also be used.

5.4 *Centrifuge*, capable of whirling the Babcock bottles at sufficient speed to give a clean separation of oil and water under the test conditions. A centrifuge giving a relative centrifugal force (rcf) of 5009 at the bottle tips has been found to give good separations in 10 min.

5.5 To calculate the rpm required to achieve the stated rcf, use the following formula:

$$\text{rpm} = 1335\sqrt{\text{rcf}/d} \quad (1)$$

where:

rcf = relative centrifugal force,

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.L0.04 on Metal Deformation Fluids and Lubricants.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The sole source of supply of the apparatus (beaker #2-584F) known to the committee at this time is Fisher Scientific.

⁴ If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,¹ which you may attend.

⁵ The sole source of supply of the apparatus (the Porta-temp) known to the committee at this time is Precision Scientific Co.

⁶ The sole source of supply of the apparatus (cream test bottle No. 12-705 or sulfonation bottle No. 6-904) known to the committee at this time is Fisher Scientific.