

T 534 om-03

PROVISIONAL METHOD – 1976
OFFICIAL TEST METHOD – 1986
PROVISION METHOD – 1992
WITHDRAWN – 1999
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CAUTION:

This Test Method may include safety precautions which are believed to be appropriate at the time of publication of the method. The intent of these is to alert the user of the method to safety issues related to such use. The user is responsible for determining that the safety precautions are complete and are appropriate to their use of the method, and for ensuring that suitable safety practices have not changed since publication of the method. This method may require the use, disposal, or both, of chemicals which may present serious health hazards to humans. Procedures for the handling of such substances are set forth on Material Safety Data Sheets which must be developed by all manufacturers and importers of potentially hazardous chemicals and maintained by all distributors of potentially hazardous chemicals. Prior to the use of this method, the user must determine whether any of the chemicals to be used or disposed of are potentially hazardous and, if so, must follow strictly the procedures specified by both the manufacturer, as well as local, state, and federal authorities for safe use and disposal of these chemicals.

Brightness of clay and other mineral pigments (d/0 diffuse)

1. Scope

1.1 This method describes a procedure for determining the brightness of clay and other mineral pigment that has been pulverized under controlled conditions and made into uniformly compacted pigment plaques. This method is for use with minerals normally used in the manufacture of paper and is not intended for highly colored pigments.

1.2 The instrument employed has the same spectral, geometric, and photometric characteristics as that described in TAPPI T 525 "Diffuse Brightness of Pulp." The brightness scale applicable to this method is the same as the brightness scale described in T 525.

1.3 In contrast to TAPPI T 646 "Brightness of Clay and Other Mineral Pigments (45°/0°)," which uses 45° illumination and perpendicular viewing, this method utilizes an instrument with an integrating sphere to provide hemispherical (diffuse) illumination and perpendicular observation. Thus, the specimen surface structure and azimuthal orientation have negligible influence on the brightness results.

NOTE 1: Brightness values obtained using this method will not agree with those obtained using T 646.

1.4 Precautions are taken to exclude specularly reflected light from smooth, glossy surfaces by requiring installation of a gloss trap in the upper hemisphere of the instrument's integrating sphere. Gloss exclusion provides measurements of the intrinsic reflectance of the pigment, which are less dependent upon specimen preparation techniques than gloss inclusion measurements.

1.5 The specimens must be prepared with close adherence to the instructions found in the Appendices.

1.6 This method utilizes sample preparation apparatus which is identical to that required for TAPPI T 646. The measurement procedure is also similar.

7. Sampling and preparation of test specimens

7.1 From each test unit obtained in accordance with TAPPI T 657 “Sampling of Fillers and Pigments,” take a specimen of dry clay or pigment sufficient for the test.

7.2 In the event that the test unit is in a dispersed aqueous slurry form, determine the percent solids and remove a slurry equivalent to 100g of dry pigment.

7.3 Prepare plaques (3 are recommended) by the procedure outlined in the Appendices. Leave the plaques in place as prepared until immediately prior to testing. Protect from circulating air, ultraviolet radiation, high humidity, dust or other contamination which might affect the optical reflectance.

8. Measurement

8.1 When ready to test, “break” the plaque free of the plate. Lift the plaque cylinder vertically to prevent “burnishing” of the plaque surface, which will result if the cylinder is twisted or moved across the glass plate. Visually inspect the plaque surface to detect surface irregularities, contamination, or other flaws in the surface to be tested. Should any such be noted, discard the plaque and prepare another.

NOTE 6: Make visual inspection and measurement within 10 s of breaking the plaque free to minimize the effects of rapidly diminishing brightness when exposed to room air.

8.2 Carefully place each prepared test plaque into position on the reflectance instrument and measure its reflectance with reference to that of a calibrated working standard in accordance with the operating instructions supplied with the instrument.

9. Report

Report the average brightness of the plaques to one decimal place. Indicate that the measurements were obtained in accordance with T 534. The report must also include the type of reflectance instrument used for the measurement and any deviations from T 534.

10. Precision

10.1 *Precision.* The following estimate of repeatability and reproducibility are based on data from different sources. The repeatability data is based on testing performed in a single laboratory; and the Reproducibility data is based on the CTS-TAPPI Interlaboratory Testing Program from 1992. The data listed below, are then percent of percent brightness.

10.2 *Repeatability.* Repeatability calculations are based on 3 determinations per result, three results per material and 4 materials. The materials were 4 different production lots of the same grade.

Mean	Repeatability
87.67	0.092 or 0.10%

10.3 *Reproducibility.* Labs were required to form the measurement plaques in their laboratories prior to testing. Participants were asked to follow TAPPI Provisional Test Method T 534. Users of this precision data should consider that these estimates reflect actual mill/laboratory data.

Material Description	Grand Mean	Range	Reproducibility R and %R		Labs Included
90 range clay	90.7	91.24 – 89.24	1.24	1.4%	17
90 range clay	89.66	90.1 – 88.18	1.26	1.4%	15
90 range clay	86.29	86.66 – 85.70	0.81	0.9%	16

Average 1.10 1.2%

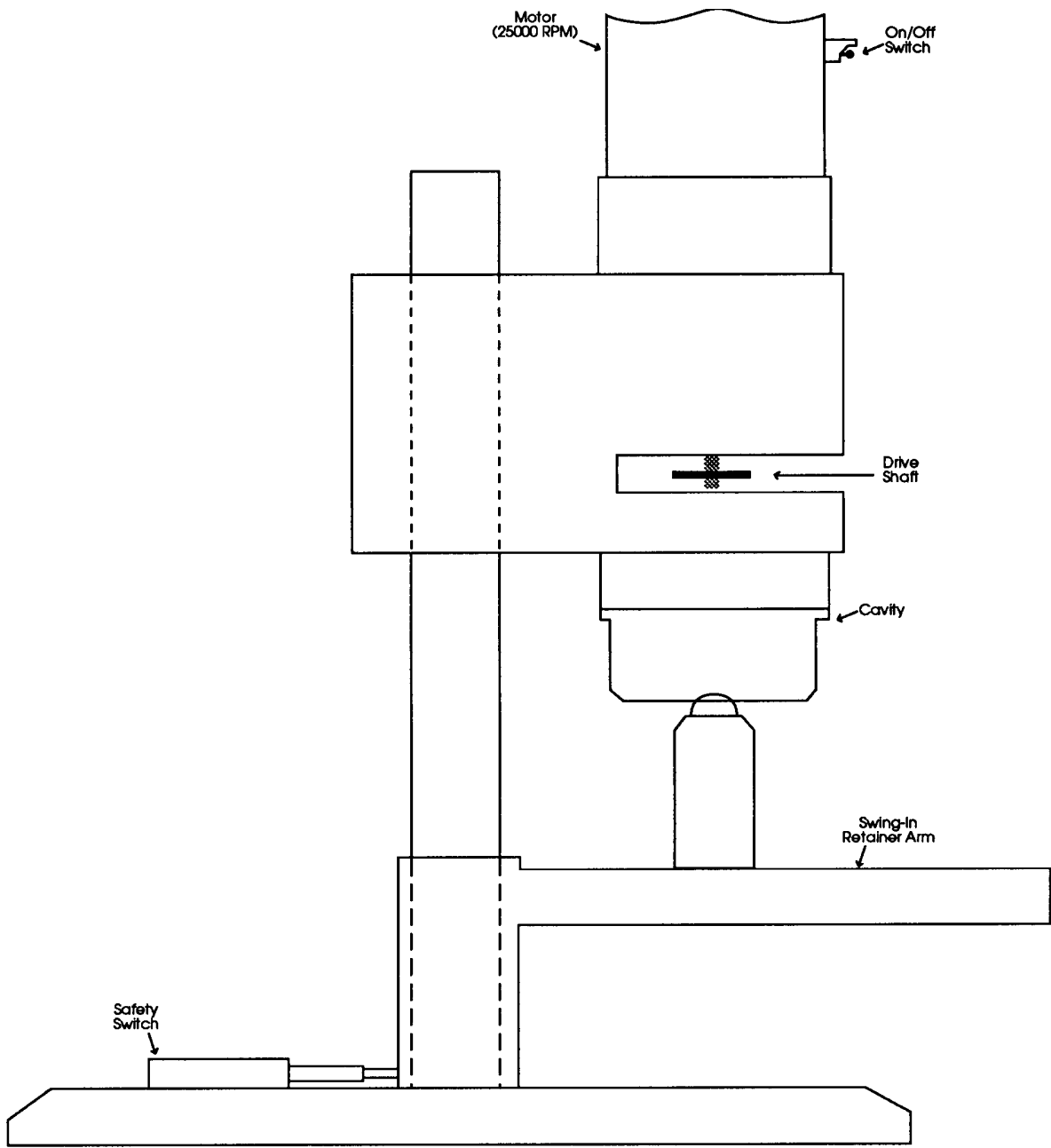


Fig. 1. Pulverizer