

T 262 sp-12

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Preparation of mechanical pulps for testing

1. Scope

- 1.1 This practice describes a procedure for the preparation of mechanical pulps prior to physical testing.
- 1.2 It is for use with pressure groundwood, refiner mechanical, chemimechanical, thermomechanical, and chemithermomechanical pulps. It may also be used on any pulp sample taken downstream of the refiners (i.e., screens, cleaners, reject refiners, etc.). The purpose of this practice is to remove latency (curl) from pulp fibers.
- 1.3 Hot disintegration of pulps containing lignin may lead to significant loss of brightness. Since brightness is not significantly changed by the presence of latency in the pulp, this procedure is not recommended for pulps that will be formed into brightness measuring sheets.

2. Summary

This standard practice involves recirculating stock at about 2% consistency and at 90–95°C for two minutes using a centrifugal pump connected to a container as a means of processing the fiber prior to physical testing to allow lessening or removal of the pulp's latency.

3. Significance

- 3.1 In the production of mechanical pulps with refiners or on grinding stones under pressure, a phenomenon referred to as “latency” is introduced into the pulp. The action of the refiner twists and rolls the fibers into balls or nodules of a highly strained state that are not removed by means of conventional disintegration.
 - 3.1.1 When disintegration is done in cold water in accordance with TAPPI T 205 “Forming Handsheets for Physical Tests of Pulp,” subsequent testing will not show the full development of the strength properties of the pulp.
- 3.2 Disintegrating the pulp at elevated temperatures and low consistency relaxes the fibers, removing the latency (fiber twists, rolls, and nodules) referred to in 3.1.
 - 3.2.1 With hot disintegration, the pulp shows complete development of strength properties without further treatment. The “latency” removal ensures full development of pulp strength properties.

Approved by the Standard Specific Interest Group for this Test Method



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4. Apparatus

- 4.1 *Disintegrator*¹ (Domtar-Type) consisting of a pump and a container (see Appendix A).
- 4.2 *Supply of hot water*, 90 - 95°C, meeting the requirements of ASTM D 1193 - Type II or distilled or demineralized water of a conductance of less than 4 µS/m (4 µΩ⁻¹/cm).
- 4.3 *Bucket*, of sufficient size to collect stock after disintegration (9.4-L or larger bucket is suitable).

CAUTION: Avoid splashing of *hot* (90 - 95°C) water in recirculation container.

5. Definitions

Latency, a condition associated with pulp fibers that have internal twists and curvature resulting from the action of (high consistency) refiners and pulp grinders.

6. Procedure

6.1 Obtain the consistency of the pulp to be hot disintegrated, according to TAPPI T 240 “Consistency (Concentration) of Pulp Suspensions.”

6.1.1 If the pulp is under 10% consistency and the temperature after dilution can be maintained at 90 to 95°C there is no need to thicken the pulp. If the pulp is under 10% consistency and the required temperature cannot be maintained after dilution, then the pulp must be thickened above 10% before proceeding. The pulp is to be thickened using general purpose ashless filter paper with medium speed and retention and a Buchner funnel (all of the fines must be retained). Measure the consistency of the thickened pulp prior to the determination of the required amount.

NOTE 1: Thickening the pulp above 10% consistency insures hot disintegration by minimizing the reduction in temperature caused by the dilution with a low consistency pulp.

- 6.2 Install the proper size container for the required sample size:
 - 6.2.1 *Small*, 1.95 L capacity² requiring 56 g oven-dry (o.d.) pulp, or
 - 6.2.2 *Large*, 6.05 L capacity² requiring 136 g oven-dry (o.d.) pulp.
- 6.3 Calculate the weight of wet pulp required to give either the 56 ± 1 g o.d. or 136 ± 2 g o.d. pulp samples.
- 6.4 Fill the container with water at 90 - 95°C, and close the lid.

CAUTION: Avoid splashing *hot* water.

6.5 Start the pump and allow the hot water to recirculate for two minutes. When time has elapsed, drain the water.

6.5.1 The preceding step warms the container, piping, and pump. If the drained water is less than 90°C repeat step 6.5.

6.6 Immediately add hot water to the container to fill approximately half full. Add the required amount of wet pulp to the container, breaking the pulp into small pieces to prevent plugging of the pump.

- 6.7 Fill the container to the baffle with more hot water.
- 6.8 Close the lid of the container and fasten securely.
- 6.9 Turn on-off switch to “on” position.
- 6.10 Set the pump timer switch to two minutes and allow to run until two minutes has elapsed.
- 6.11 Place a bucket or pail of appropriate size to collect all the stock and rinse water under the container. Then

open the drain valve, add about 4.0 L of hot water to the container, and run the pump (for a brief interval) to drain all the pulp slurry from the system.

NOTE 2: To avoid damage to the pump, never run the pump for more than 3 s without liquid in it.

¹Names of suppliers of testing equipment and materials for this method may be found on the Test Equipment Suppliers list, available as part of the CD or printed set of Standards, or on the TAPPI website general Standards page.

²This is in addition to a pump loop capacity of 1.05 L.