UM 242

ISSUED PRIOR TO 1991
REVIEWED AND RETAINED IN THE UM SET – 2010
©2010 TAPPI

The information and data contained in this document were prepared by a technical working group of the Association. The working group and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

PLEASE NOTE: A TAPPI Useful Method (UM) is a document written to describe a test, procedure, or practice which may be proposed by a Working Group of no fewer than three TAPPI members not employed by the same organization and written in the same general style as a TAPPI Standard Test Method, but with the inclusion or exclusion of certain sections as deemed appropriate by the Working Group, and with minimum precision requirements that may be expanded at the discretion of the Working Group. A UM is written with no less attention to proper use of the language to describe the procedure using essentially the same elements of a TAPPI Standard Test Method, but in a less rigorous manner. TAPPI Useful Methods do not receive the same review through a rigorous process of openness, voluntary review, and consensus as do the TAPPI Standard Test Methods, and as such, are not intended to be used as referee methods as the TAPPI Standard Test Methods are.

CAUTION:
This 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.

Shive content of mechanical pulp (Somerville fractionator)

Scope

This method for shive determination makes no attempt to classify the undesirable material in detail, but such a refinement should be within the reach of any user of the method if desired. The dimensional limits dividing acceptable mechanical pulp from objectionable material are arbitrary; this method has been designed to ensure as far as possible that no useful material is included in the rejects and that no objectionable material remains in the accepted pulp. Sulfite pulps, examined according to this method, give results in the order of 0.05% shives, an indication that few long fine fibers are included in the rejected portion of the pulp. Accordingly, the method may be used for mechanical pulp containing some machine broke.

Safety precautions

There are no particular additional safety requirements for this method.

Significance

The presence of mechanical pulp shives in newsprint and other papers containing mechanical pulp has been shown to be a major source of difficulty in press rooms and to detract from the printing quality of the paper.

Approved by a Working Group of TAPPI in accordance with the Useful Method Guidelines
TAPPI

Documents
Document Sharing Hub

Provided by IHS
No reproduction or networking permitted without license from IHS
Full document details: TAPPI UM 242 2010
Licensee=University of Alberta/5966844001, User=albert, sam
Not for Resale, 11/10/2014 04:42:14 MST

Apparatus

1. *Fractionator*, as described by Somerville (*1*), but fitted with a plate having 756 slits, 45 mm long by 0.15 mm wide. A spray nozzle is screwed into the center of the fractionating plate. The nozzle has an inside diameter of 19 mm ($^3/_4$ in.), and 12 holes of 1.1-mm (0.042-in.) diameter are spaced equally around its lower end so that their centers are 2.4 mm ($^3/_{32}$) in.) above the surface of the screen plate.

The fractionator consists of a rectangular base, 254 × 305 × 219 mm deep (10 in. × 12 in. × $8^5/_8$ in deep), inside dimensions. This rests on the screen plate which is supported by an intermediate casting which includes a weir box, and overflow outlet, and drain cock. This casting is flanged and bolted to the flanged base, with a rubber diaphragm gripped between the flanges. The screen box is attached to the intermediate casting by adjustable hinges at one end and screw clamps at the other. The screen plate is held between two rubber gaskets when the screen box is clamped in position.

IMPORTANT NOTE: The width of the slits in the screen plate is a paramount factor in this determination. Each plate should be checked carefully when received, and preferably calibrated against a master plate. Plates should be rechecked at frequent intervals and must obviously be kept clean.

The rubber diaphragm is operated by an eccentric mechanism which provides a vertical movement of 3.2 mm ($^1/_8$ in.) and the shaft driving the eccentric is rotated at 690–700 rpm. The weir height is adjusted to give a depth of water above the screen of 102 mm (4 in.) Water at a controlled pressure of 124 kPa (18 psi) is required and a reliable gauge is inserted between the control valve and the spray.

2. A *container* of about 20-L capacity equipped with a filter funnel or some other means of separating the rejected material from the dilute suspension. The Tappi Standard Sheet Machine, or other similar device, may be used for dewatering, but the filter medium must not be coarser than 100 mesh.

3. *Sintered glass-bottom crucibles* are required for the final oven-drying and weighing procedure.

4. *Drying oven*, with free air circulation capable of maintaining a temperature of 105 ± 2°C.

Sampling and test specimen

Take a sample of pulp from slush stock or its equivalent, requiring no further disintegration. Dilute about 100 g (o.d. basis) of the sample to about 0.5%. Determine the consistency and measure out a test specimen equal to 25.0 g o.d. (about 5000 mL).

Procedure

1. Assemble the fractionator and add water to the screen box so that the screen plate is covered by about 25 mm (1 in.). Add the test specimen to the water in the screen box. Open the valve to the spray nozzle and adjust the pressure to 12 kPa (18 psi). As soon as overflow occurs at the weir, start the motor. Allow the overflow water to run to waste. (If it is desired to collect the accepted pulp, some means for concentrating the very dilute suspension, without loss of fines, must be provided.) Momentary variations in water pressure of ±1 or 2 psi are allowable, but the mean value of 124 kPa (18 psi) must be maintained throughout the determination. The mean overflow rate should be 8.600 mL/min.

2. Stop the motor after 20 min. Open the drain cock. Wash down the screen box, spray nozzles and connecting hose, using a small stream of water. Make sure all the shives are on the plate. Disconnect the hose and remove the screen plate. Collect the shives by washing the plate into the 20-L container. Stand the screen plate vertically in it and wash the slits from the underside and then from the top side, with a fine jet of high-pressure water.

Documents
Document Sharing Hub

Provided by IHS
No reproduction or networking permitted without license from IHS
Full document details: TAPPI UM 242 2010

Licensee=University of Alberta/5966844001, User=albert, sam
Not for Resale, 11/10/2014 04:42:14 MST