UM 542
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Amount of coating on mineral-coated paper

Scope

This method is suitable for the ordinary types of mineral coatings. It may not be effective for special types, such as where lacquers or other materials are used to impart a high degree of water resistance. It is not suitable for coatings containing synthetic binders.

NOTE 1: The exact publication date of this method is unknown, but it is based on a literature publication from 1930 (see Literature cited). The user of this UM shall determine applicability to any current papers on which the test is performed.

Safety precautions

Consult the manufacturer's Materials Safety Data Sheet for the safe handling and disposal of the enzymes used.

Apparatus

1. *Pane of glass*, approximately 200 × 250 mm (8 × 10 in.).
2. *Camel's hair brush.*
3. *Container*, a flat-bottom tray of sufficient size (approximately 150 mm × 150 mm (6 in. × 6 in.) to allow the sample to lie flat while soaking, or a glass cylinder (large drinking glass or flower vase) to completely submerge the test piece without overlap (approximately 150 mm in height by 50 mm diameter (6 in. × 2 in.), for decoating a specimen with enzyme solution

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

Enzyme solution, aqueous solution of approximately 1.5 g of trypsin (*1*) and 25 mL of 0.1*N* NaOH per 1000 mL.

NOTE 2: For alternate enzyme mixtures used commercially for desizing cotton and degumming silk, which act more rapidly, enzyme suppliers should be contacted.

Test specimen

Obtain a sample in accordance with TAPPI T 400 "Sampling and Accepting a Single Lot of Paper, Paperboard, Containerboard, or Related Product." From each test unit, cut two square specimens 160 cm^2 (25 $in.^2$) in area.

Conditioning

Condition and test the specimen in accordance with TAPPI T 402 "Standard Conditioning and Testing Atmospheres for Paper, Board, Pulp Handsheets, and Related Products."

Procedure

Measure the area of the test specimen with an accuracy of ±0.5%. If the test specimen is 127 × 127 mm (5 × 5 in.), this requires measuring the length and width to the nearest 0.6 mm (0.025 in.)

Weigh the test specimen with an accuracy of ±0.5%. For lightly coated papers, this requires weighing to the nearest 0.005 g; for heavily coated papers, it may require weighing to only the nearest 0.05 g.

Place the specimen in the container so that the enzyme solution has free access to the entire surface of the coating. It may be laid in a flat-bottom tray or rolled in cylindrical form and placed in a cylinder or buret.

Pour sufficient enzyme solution over the specimen to cover it completely. Allow to stand for at least one hour at 50°C. Place paper on a pane of glass and brush off the coating with the camel's hair brush. Take care not to dislodge the paper fibers. Additional heating, and in some cases additional enzyme solution, may be necessary for very resistant coatings.

After entire removal of coating, stand the glass pane at a slight angle and wash the paper on both sides by using a wash bottle while holding the paper on the glass by one corner. After conditioning according to T 402, weigh the decoated paper to constant weight. Make at least two determinations.

Calculation

Calculate the percent coating and the coating weight as follows:

$$P = [(A - B) / B] \times 100$$

$$W = (A - B) / C$$

$$W_b = B / C$$

where

A	=	original specimen weight
B	=	decoated specimen weight
C	=	specimen area, m^2
P	=	coating, decoated paper basis, %
W	=	coating weight, g/m^2
W_b	=	basis weight of decoated paper, g/m^2

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