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Physical characterization of press fabrics: basis weight, air permeability, void volume under loading and pressure uniformity

Introduction

This Technical Information Paper provides a means of measuring several fabric characteristics of new press fabrics. For on-machine monitoring of the press fabric, refer to TAPPI TIP 0404-19 “Press Section Monitoring.”

The characteristic properties covered in this TIP are (a) the basis weight or unit area weight, (b) the air permeability, (c) the void volume and (d) the pressure uniformity of a press fabric. The supplier typically performs these measures.

This revision combines information from earlier versions of TIP 0404-20 with material from withdrawn TIPs 0404-32 and 0404-34.

Basis weight of a press fabric

Scope

The purpose of this method is to note the conditions under which a press fabric is measured for size and basis weight. This procedure is intended for use either in the mill or in a laboratory. Use of these conditions will enable paper mills to compare fabrics from one company to those of another with respect to basis weight. This test is to be used for all fabrics regardless of position or product being made on the machine.

Summary

The weight and size of a press fabric are measured at standard textile conditions of 21°C (70°F) and 65% RH, under a tension of 2.1 kN/m (12 pli).

Significance

The basis weight is a measure of the mass of material, per unit area, contained in the structure of a press fabric. No direct correlation has been established between the basis weight and performance of the fabric across paper grades, however this characteristic may relate, to some extent, to other properties such as thickness, void volume, robustness, and compaction resistance. In actual use, the uniformity of mass distribution is usually a more critical parameter than the basis weight itself.