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### Anisotropy effects on the acoustical properties of porous materials

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Porous materials are now widely used in noise control for their acoustic properties in sound absorption and transmission. These properties are function of the internal porous medium structure. Generally, most of the models assume that the porous medium is isotropic. Mineral wools (as well as some foams) clearly present an anisotropic structure.

This communication is concerned with the adaptation of recent works on isotropic materials to the case of anisotropic porous materials. The general theory will be exposed for sound absorbing materials with anisotropic acoustical and mechanical parameters. The case of transverse isotropic materials (with fibers organized in planes running parallels one to each other) will then be detailed in particular in the case when the plane of fibers is not the same than the normal plane of the sample. The influence on the acoustical properties anisotropic porous materials will then be presented.

Illustrations are then provided with measurements performed on wools and it will be shown that the rigidity coefficients of a sample can be evaluated at audible frequencies from measurements in particular from the speed of the Rayleigh wave in different directions.