Linearly polarized ultrasonic shear waves constitute a privileged tool for investigation in the field of mechanical behavior of materials and metallic structures as well as for the determination of acoustical properties of porous materials. These waves are often generated by a piezoelectric plate vibrating in a direction perpendicular to its thickness. However, this way of production presents some difficulties to obtain a perfectly linear polarization. To palliate to this inconvenience, shear waves can be generated by the mode-conversion of a longitudinal wave. This paper deals with the principle and some applications of two types of mode conversion transducers which permit transmitting and receiving shear waves obtained by reflection mode-conversion. These transducers are made up with straight ultrasonic probes coupled, by contact, to acoustic delay lines (or relays) of different geometry. The first type of transducer uses an acoustic relay or delay line of big length. When it is buried in a recipient containing dry sand, it permits the detection of external mechanical disturbances as vibrations and transient shocks. The second type of transducer, for which the delay line has a reduced length, is used for the detection of material anisotropy and for the study of the polarization direction of conventional normal incidence shear wave transducers.