Production of Fine-Grained Metals by Rotary-Die Equal-Channel Angular Pressing (RD-ECAP)

Naobumi SAITO
Institute for Structural and Engineering Materials
e-mail:
naobumi-saito@aist.go.jp
AIST Today Vol. 2, No. 10 (2002) 17

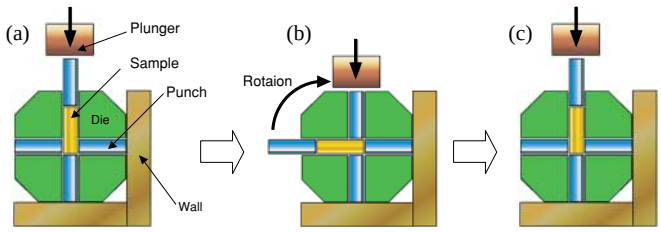
We have developed the new ECAP (Equal-channel angular pressing) process termed RD(Rotary-Die) ECAP. In current ECAP, a billet is repeatedly passed through two channels of equal cross-section intersecting at an angle. Then, intense plastic strain is introduced in a material without changing the cross-sectional area. RD-ECAP is differentiated from current ECAP by the following characteristics.

·Billet removal and re-insertion between passes are not required.

·The ECAP time is reduced by more than 75% compared to ordinary ECAP.

·The ECAP temperature can be precisely controlled and altered for different passes.

RD-ECAP is being applied to produce nano-structure metallic materials.

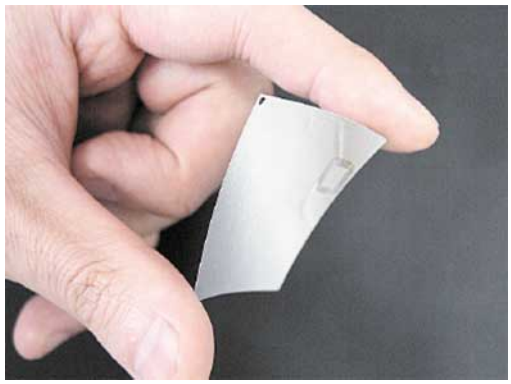


RD-ECAP process sequence. (a) initial state, (b) after one pass, and (c) after 90° rotation.

Deveropement of Flexible Thin Film Piezoelectric Sensor

Naohiro UENO
Institute for Structural and Engineering Materials
e-mail:
ueno-n@aist.go.jp
AIST Today Vol. 2, No. 11 (2002) 10

A foil type flexible pressure sensor based on piezoelectric of highly C-axis oriented aluminum nitelide (AlN) thin film deposited on an aluminum foil substrate was developed. The sensor is composed of two AlN thin films and three aluminum foils as electrodes which detect the electric charge generated by pressure acting on the AlN film. The developed sensor having excellent flexibility can fit any curved surface like skin of human beings. Directly or indirectly, pulse wave of human beings can be detected precisely by using the developed sensor.



Developed sensor