

Main features:

Determination of

fracture toughness

rate over the whole

relevant range

ceramics, rocks, metals, mortar...)

as a function of loading

Technique practicable

for all materials (glass,

## **Application fields:**

Materials

- Failure under dynamic loading conditions (impact, explosion,...)
- Failure analysis

## Determination of fracture toughness and its variation with crack speed

The toughness of a material defines its resistance to fracture. This quantity is wrongly considered as a material constant while it often varies a lot with the crack speed. As a consequence, the rationalization of the material behavior upon dynamic failure (as in impact problems,for instance) remains mainly empirical. The protocol developed at CEA enables to measure precisely the value of the fracture toughness as a function of the crack speed over the whole relevant range.



Guerra et al. PNAS,

Application illustration :

Fracture energy as a function of crack speed in PMMA

Fiche technologique

