

"Split Hopkinson Bar Testing Apparatus"

Description

The invention relates to an improvement of the existing Split Hopkinson Bar Testing apparatus. Some drawbacks have been observed with this system, involving imperfect energy transfer to the specimen and limitations to the size of the specimen.

This innovation uses the storage and sudden release of elastic potential energy in the preloaded static impactor bar to achieve a collision. The specimen is placed between the input and output bars, and is hit by a pressure wave generated from the collision of the input bar with a projectile fired from a hydraulic actuator. The elastic energy, causing the collision when released, is stored in a fragile component placed along the length of the impactor bar thus allowing the generation of a uniform pressure wave of precisely known amplitude and duration.

Additionally, a cylindrical collar welded at the end of the impactor along with a blocking system ensures a perfectly parallel alignment of the colliding components and prevents movement of the impactor bar to the opposite direction.

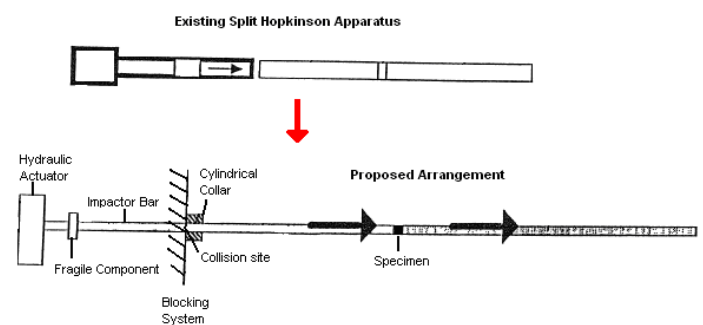
Furthermore, this invention offers the option of testing specimens of different size and geometry by simple alterations of the current arrangement. Also the length of the impactor bar can be increased up to several meters in order to increase the length of the compression pulse without any vibration problems.

Innovative aspects and main advantages

- Production of a homogeneous compressive stress wave of known amplitude and duration
- Pulse generation propagates through entire system without perturbations
- Length of compression bars can be increased without vibration or guidance problems
- Larger or different shaped specimens can be tested

Areas of application

- Material Testing
- Automotive Industry



Stages of development

Patent Priority date 12/12/1996 EP

Patent granted EP 0886770
JP 3594036
US 6109093

Scientific contact

George Solomos
Joint Research Centre, IPSC
European Commission
Tel: (+39) 0332789916
Email address: George.Solomos@jrc.it

Licensing contact

Intellectual Property and Scientific Cooperation Unit
DG JRC - European Commission
B-1049 Brussels, Belgium
Email: JRC-TechTransfer@ec.europa.eu

Reference: file n°2505