

## عنوان مقاله:

Characterizing dynamic behavior of metals, polymers and concretes using split Hopkinson pressure bar test

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## خلاصه مقاله:

In the present research, we employ Split Hopkinson Pressure Bar (SHPB) test to characterize dynamic behavior of different materials (metals, polymers and concretes). An SHPB apparatus consists of a gas gun, a striker bar, an incident bar, a transmission bar and a measurement system. Strain gages measure the incident, reflected and transmitted strain pulses. These strains are then processed to obtain strain and stress in the specimen. To get reliable results for these materials, the material as well as dimension of the pressure bars should be chosen carefully. These parameters are strongly dependent on the specimen material. In this paper, we first present a setup for testing these materials in which the pressure bars are adopted according to the specimen. For metals, polymers and concretes we use small diameter 4340 steel bars, small diameter acrylic bars and large diameter pressure bars, respectively. In the second part we present an algorithm developed for data processing as a measuring system. This algorithm is usable for different pressure bars and performs dispersion correction and signal synchronizing and checks the dynamic equilibrium in the specimen. The output of the measuring system is stress-strain and strain rate-time curves in the specimen. Finally, the results of several experiments on these three groups of materials are presented to show the effectiveness of the developed setup and measuring system in SHPB experiments.

## کلمات کلیدی:

split Hopkinson pressure bar, high strain rate, mechanical behavior, metals, polymers, concretes

## لینک ثابت مقاله در پایگاه سیویلیکا:

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