

THE COLLAPSING MECHANISM OF ALUMINUM FOAMS

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ABSTRACT

In the present study, we investigate the effect of the trapped gas in close cell Al-foams under collapsing conditions. Experiments are done using impact pendulum and shock tube facilities. It is found that there is a significant difference between the results obtained in these two systems. The stress- strain curve measured in the shock tube is found to be higher than the one found in the pendulum system. The encapsulated sample used in the shock tube limits the exhaustion to the atmosphere of the gas trapped in the foam. By measuring the gas effect on the compression only, we are able to separate the effect of the trapped gas from the overall collapsing process. After subtracting the gas effect that is present in the shock-tube results from the obtained stress- strain curve, we recover the stress- strain curve measured in the impact pendulum. This finding demonstrates the non-negligible effect of the gas especially when the Al-foams are encapsulated or when applying the Al-foams in large areas.