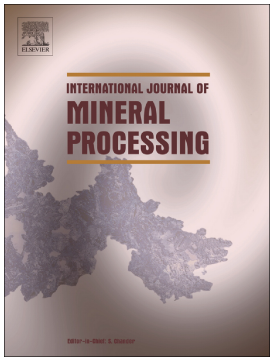

Quantifying of impact breakage of cylindrical rock particles on an impact load cell

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PII: S0301-7516(17)30027-3
DOI: doi: 10.1016/j.minpro.2017.02.005
Reference: MINPRO 3016

To appear in: *International Journal of Mineral Processing*

Received date: 31 August 2016
Revised date: 2 January 2017
Accepted date: 13 February 2017

Please cite this article as: Benjamin Bonfils , Quantifying of impact breakage of cylindrical rock particles on an impact load cell. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Minpro(2017), doi: 10.1016/j.minpro.2017.02.005

Quantifying of impact breakage of cylindrical rock particles on an impact load cell.

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Abstract. The detailed understanding of rock impact breakage represents a key challenge in the development of comminution models. Semi-empirical properties have been used to describe ore competencies, such as the JK breakage index t_{10} and Axb values, but are not able to estimate mechanical properties linked with particle fracture. The information derived from particle breakage testing on impact load cells devices, have the potential estimates such mechanical properties. However, the large intrinsic natural variability of rocks and ores composition and shape makes the results difficult to analyse and difficult to compare against each other for particles with similar properties. This study investigates the effect of rock shape on the variability of the impact breakage test conducted on impact load cells. The test methodology was modified to account for shape when testing regular shape samples such as drilled mini-cores, with objective of reducing the intrinsic variability caused by rock shape, using a controlled shaped sample. The promising results open new avenues for establishing relationships between rock composition, texture and mechanical properties.

Keywords: Comminution, fracture energy, rock shape, cylindrical rock, impact load cell