

Accepted Manuscript

The influence of water, snow and granular ice on ice failure processes, ice load magnitude and process pressure

Regina Sopper, Claude Daley, Bruce Colbourne, Stephen Bruneau



PII: S0165-232X(17)30191-X
DOI: doi: [10.1016/j.coldregions.2017.04.006](https://doi.org/10.1016/j.coldregions.2017.04.006)
Reference: COLTEC 2385
To appear in: *Cold Regions Science and Technology*
Received date: 9 June 2016
Revised date: 18 December 2016
Accepted date: 25 April 2017

Please cite this article as: Regina Sopper, Claude Daley, Bruce Colbourne, Stephen Bruneau , The influence of water, snow and granular ice on ice failure processes, ice load magnitude and process pressure. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Coltec(2017), doi: [10.1016/j.coldregions.2017.04.006](https://doi.org/10.1016/j.coldregions.2017.04.006)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

The influence of water, snow and granular ice on ice failure processes, ice load magnitude and process pressure

Authors

Regina Sopper¹, Claude Daley², Bruce Colbourne³, Stephen Bruneau⁴

Memorial University of Newfoundland, St. John's, Newfoundland, Canada A1B 3X5

Abstract

This paper describes the outcomes of a series of laboratory ice crushing experiments that was performed (Sopper, 2016) to investigate the effects of external boundary condition and indenter contact geometry on ice load magnitude under crushing conditions. Four boundary conditions were considered: dry cases, submerged cases, and cases with the presence of snow and granular ice material on the indenter surface. Indenter geometries were a flat plate, wedge shaped indenter, (reverse) conical indenter, and a hemispherical indenter. These were impacted with artificially produced ice specimens of conical shape with 20° and 30° cone angles. All indenter – ice combinations were tested in dry and submerged environments at 1 mm/s and 100 mm/s indentation rates. Additional tests with the flat indentation plate were conducted at 10 mm/s impact velocity and a subset of scenarios with snow and granular ice material was evaluated.

The tests were performed using a material testing system (MTS) machine located inside a cold room at an ambient temperature of - 7°C. Data acquisition comprised time, vertical force, and displacement. In several tests with the flat plate and wedge shaped indenter, supplementary information on local pressure patterns and contact area were obtained using tactile pressure

¹ rsopper@mun.ca, corresponding author, +491781883299

² cdaley@mun.ca

³ bruce.colbourne@mun.ca

⁴ sbruneau@mun.ca

Download English Version:

<https://daneshyari.com/en/article/5779426>

Download Persian Version:

<https://daneshyari.com/article/5779426>

[Daneshyari.com](https://daneshyari.com)