

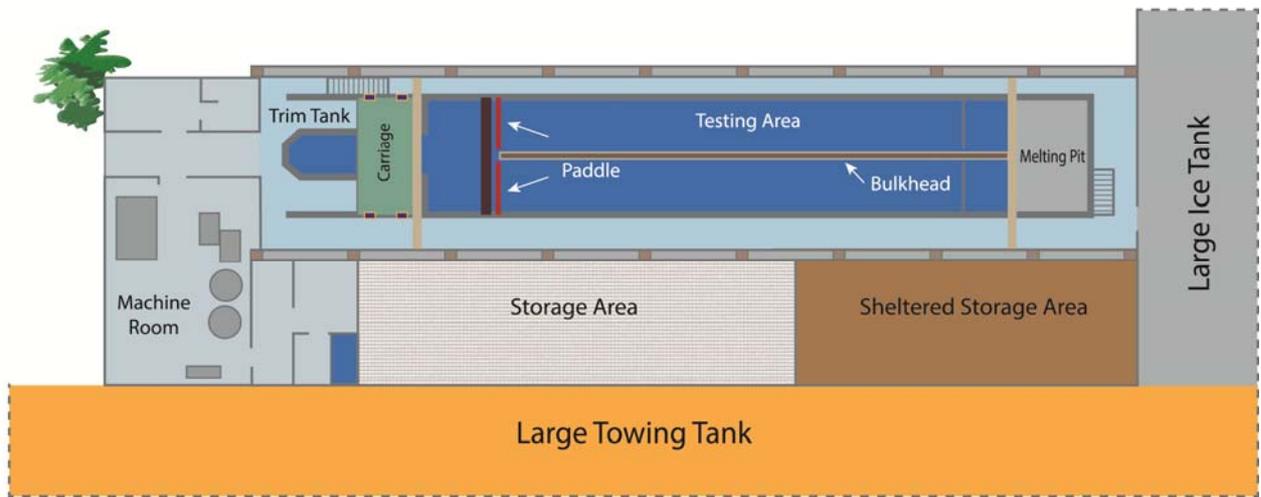
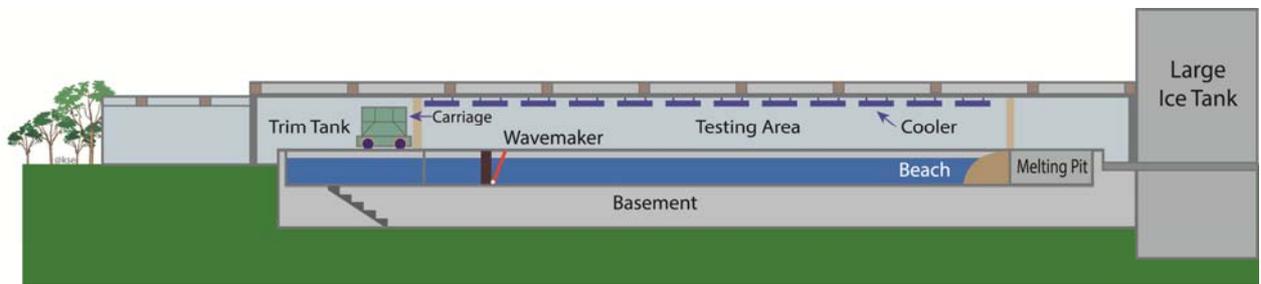
<b>Name of organization</b> Hamburgische Schiffbau-Versuchsanstalt GmbH (HSVA)	<b>Year of information updating</b> 2016
<b>Year established</b> 1913	<b>Year of joining the ITTC</b> since its foundation
<b>Address</b> <b>Bramfelder Strasse 164, 22305 Hamburg</b>	<b>Status in the ITTC</b> Advisory council member
<b>Contact details</b> (phone, fax, e-mail) Phone: +49 40 69203 0 Fax: +49 40 69203 345 Email: info@hsva.de	<b>Website</b> www.hsva.de

<b>Type of facility</b> Ice Basin	<b>Year constructed/upgraded</b> 1972/1990/2015-16
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<b>Name of facility</b> Arctic Environmental Test Basin, AETB	<b>Location</b> (if different from the above address)
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**Main characteristics** (dimensions of tank/basin/test section; for simulators: full mission, part task or desk top)  
LxBxD 40x6x1.5 m; testing area 30x6x1.2 m

**Drawings of facility**



**Detailed characteristics** (carriages, wave/current/wind generators, instrumentations, etc.)

**Cooling system:**

Refrigeration capacity: 60 kW  
Room temperature: +5 to -20 °C  
Freezing rate: typical 1.6 mm/h

**Ice type:** Natural grown columnar grained ice frozen from any solution incl. sea water

The following ice conditions can be simulated in the tank:

- Level ice, 10mm <-> 300mm,
- Rafted ice
- First- & multi-year pressure ridges
- Natural broken floe ice
- Rubble ice & pack ice
- Frazil and pancake ice
- Frazil and pancake ice can be produced by operating the wave generator

**Mobile Wavemaker:**

Type: Flap, 2 elements of 2.8 m width each  
Max. wave height: 120 mm  
Max. wave period: 2 s  
Total power: 5 kW

**Underwater video system** allows visual observation and documentation of scenarios underneath the ice cover.

**Service carriage with gantry crane:**

Speed: 5 – 500 mm/s  
Load capacity: 20 kN both vertical and horizontal  
Pushing force: 2 kN  
Working area: 4x4 m

**Two small movable working platforms****Applications** (Tests performed)**Special features of the Arctic Environmental Test Basin are:**

- Simulation of real Arctic conditions
- Generation of propagating waves (max. wave height 0.12 m)
- Simulation of current and wind conditions (on request)
- Controlled lighting for optimum algae growth

**The Arctic Environmental Test Basin is suitable for a wide range of investigations:**

- Study of physical ice growth processes
- Investigation on microstructure of ice
- Study of sedimentological processes
- Sea ice ecology
- Study of marine biological processes in the ice
- Penetration and distribution of oil in ice
- Biodegradation of oil polluted ice
- Weathering of oil
- Testing of oil spill recovery systems

**Published description** (Publications on this facility)

[www.hsva.de](http://www.hsva.de)

Callinan, C.J., Evers, K.-U., Wilkinson, J. and Shen, H.H. ,2014. A Laboratory Study of Wave Propagation in Frazil/Pancake and Fragmented Ice Covers, Report 14-02, Department of Civil and Environmental Engineering, Clarkson University, Potsdam, NY 13699-5710.

Christopher Callinan, Karl-Ulrich Evers, Jeremy Wilkinson, and Hayley Shen, 2014. Wave Propagation in Frazil/Pancake and Fragmented Ice Covers – Part I: Description of the laboratory study. Proceedings of 22<sup>nd</sup> IAHR International Symposium on Ice, Singapore, August 11 to 15, 2014, Paper ID: 1225

Jiayun Zhou, Master; Bruno Delille; Hermanni Kaartokallio; Gerhard Kattner; Harri Kuosa; Jean-Louis Tison; Riitta Autio; Gerhard S. Dieckmann; Karl-Ulrich Evers; Linda Jørgensen; Hilary Kennedy; Marie Kotovitch; Anne-Mari Luhtanen; Colin A. Stedmon; David N. Thomas, 2014. Physical and bacterial controls on the distribution of inorganic nutrients and DOC in sea ice during an experimental ice growth and decay cycle, Elsevier Marine Chemistry, paper submitted May 2014

Jeremy Wilkinson, Ted Maksym, Chris Bassett, Andone Lavery, Hanu Singh, Dale Chayes, Pedro Elosegui, Peter Wadhams, Karl Ulrich-Evers and Peter Jochmann, 2014. Experiments on the Detection and Movement of Oil Spilled under Sea Ice, Proceedings of the HYDRALAB IV Joint User Meeting, Lisbon, July 2014

Wang, R., Shen, H. H. and Evers, K.-U., 2008. An Experimental Study of Wave Induced Ice Production, Proceedings of 19th IAHR International Symposium on Ice, "Using New Technology to Understand Water-Ice Interaction", Vancouver, British Columbia, Canada, July 6 to 11, 2008

Shen, H.H., Evers, K.-U., Ackley, S.F., Dai, M. and Wilkinson, J.,2003. Salinity and Porosity of Laboratory Grown Young Pancakes, 17th International Conference on Port and Ocean Engineering under Arctic Conditions (POAC'03), June 16-19, 2003, Trondheim, Norway.

Evers, K.-U., Shen, H.H., Dai, M.; Yuan, Y., Kolerski, T. and Wilkinson, J.,2002. A Twin Wave Tank Pancake Ice Growth Experiment, Proceedings 16<sup>th</sup> IAHR International Symposium on Ice, University of Otago, Dunedin, New Zealand, 2-6 December, 2002 , Vol. 2, pp. 150-164 [pdf]

Eicken, H., Weissenberger, J., Bussmann, I., Freitag, J., Schuster, W., Delgado, F. V., Evers, K.-U., Jochmann, P., Krembs, C., Gradinger, R., Lindemann, F., Cottier, F., Hall, R., Wadhams, P., Reiemann, M., Kuosa, H., Ikävalko, J., Leonard, G. H., Shen, H., Ackley, S., Smedsrud, L. H.,1998. Ice-tank studies of physical and biological sea-ice processes, Proceedings 14th International IAHR Ice Symposium, Potsdam, N.Y. July 1998 Ice in Surface Waters, Editor Hung Tao Shen, Balkema: Rotterdam, 363-370