

# ABB Switzerland Ltd.



Power and Automation Technology

Switzerland

[www.abb.com](http://www.abb.com)



Icepak®

## Overview

The ABB group is a world leader in power and automation technology. Its products include electric motors, drives, converters, circuit breakers, robots, semiconductors, sensors and many more. ABB products are widely used in all kind of applications, from large industrial applications (such as paper mills, trains, ships and car assembly lines) to small domestic ones (such as wall switches and circuit breakers).

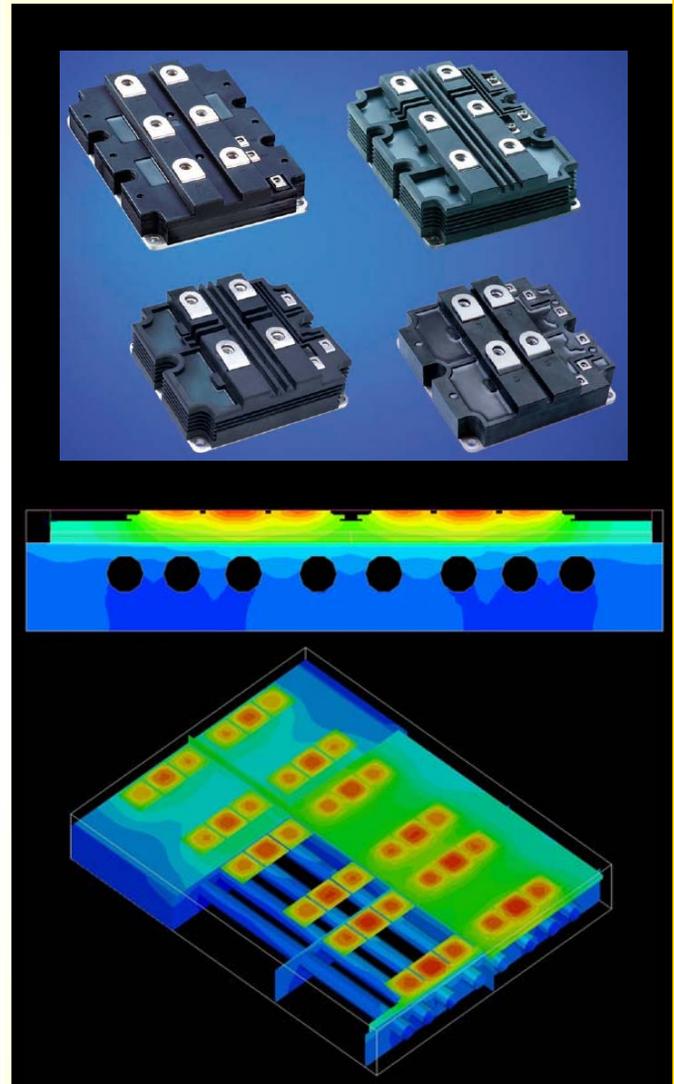
The ABB Group of companies operates in approximately 100 countries and employs about 108,000 people.

## Testimonial

"ABB engineers continuously strive to improve product efficiency, but some heat losses are inevitably present, from small light dimmers to large converters. Since product performance and reliability are ABB's primary targets, it is vital to have an excellent thermal design. Low temperatures and low temperature gradients are the keys for higher reliability. A more efficient thermal management also allows more power to be drawn by the same device, thus stretching its range of operation.

"Icepak software provides a quick, accurate and reliable tool for the thermal management design and analysis of our products."

**Dr. Matteo Fabbri**  
Scientist, Corporate Research  
ABB Switzerland Ltd.



## Challenge

The ABB HiPak™ modules can be used in a variety of applications, from traction converters to motor drives. As such, the cooling systems used to remove the heat dissipated by the insulated gate bipolar transistors (IGBT) and diodes can be substantially different from one another. It is crucial for ABB to be able to predict the maximum package temperature to ensure reliability and proper functionality.

## Solution

Icepak software allows the prediction of the entire temperature field of the coupled HiPak module–heat exchanger system. It also provides a quick and reliable means to find the optimal heat exchanger configuration.

Icepak also is used in the thermal design and analysis of many other ABB products, ranging from power electronics modules to complete control cabinet for robots.

## Benefits

Icepak software has allowed an accurate prediction of the temperature in each power electronics package component during the system design. It also enables the prediction of the effects of modifications to the HiPak module, such as the use of new materials or components.

The possibility of running parametric calculations provides a very quick way to gain insight on the effect and importance of the system key design parameters.