NEW PASCAL™ TECHNOLOGY HELPS HAIER IMPROVE ENERGY EFFICIENCY AND PRODUCTIVITY

**Market:** Household Appliances  
**Application:** Refrigerator and Freezer Insulation  
**Region:** Global  
**Product:** PASCAL™ Technology

**The Challenge**
In the competitive household appliance industry, refrigerator and freezer manufacturers are constantly looking for ways to both meet consumer needs and comply with increasing energy efficiency regulations. Energy efficiency improvements usually bring a host of added costs and design trade-offs.

These competing challenges and trade-offs were well known to Haier, a global leading appliance manufacturer based in China and a Dow customer for more than 20 years. Like other appliance manufacturers, Haier knew that it could increase energy efficiency by using a higher-grade polyurethane with better insulating values. However, Haier also found that those formulations typically lead to higher overall production costs due to reduced flow, longer curing time and the need for more polyurethane material. In addition, designing new, sophisticated refrigerators and freezers was becoming more challenging because of the difficulty of applying polyurethane into unit crevices and compartments. Dow offered Haier a unique and innovative solution – PASCAL™ Technology – which addressed most problematic design needs and processes.

**The Solution**
PASCAL™ Technology from Dow is a new polyurethane system technology that helps appliance manufacturers like Haier increase energy efficiency without sacrificing design flexibility or increasing production costs.

PASCAL™ Technology uses a patented high-grade polyurethane system with a new specially designed and patented machine processing “vacuum” from Cannon SpA, that requires less material and allows up to 50 percent faster demold times compared to standard processes. The vacuum system also helps ensure that the cabinet fills more consistently without using more polyurethane material, as is typically required in standard processes, because the fast-reacting foam material is actually pulled into the cavity instead of relying on the foam to fill the cavity by itself.

Haier was the first appliance manufacturer to embrace the advantages of PASCAL™ Technology for its line of refrigerators and freezers. Dow unveiled PASCAL™ Technology in conjunction with Haier at the World Appliance Expo in Shanghai on March 16, 2011.

“We’re excited to have Haier as the first to invest in and feature PASCAL Technology in its household refrigerators and freezers,” said Bruno Barbet, Dow global polyurethane appliance market leader.

“PASCAL Technology aims to truly revolutionize current refrigerator and freezer insulation methods, while also helping to address government standards and the energy efficiency needs of consumers.”

**The Results**
With PASCAL™ Technology, Haier has doubled its polyurethane thermal performance and is now meeting, and sometimes exceeding, its energy efficiency requirements. The technology has also helped Haier cut its manufacturing costs by increasing productivity and reducing the amount of material used. And Haier has been able to apply the technology without giving up design flexibility for current and future models. PASCAL™ Technology also contributes to Haier’s improved carbon footprint – when used instead of standard appliance polyurethane insulation, it may save 8 kg of CO2 equivalent emissions per year per appliance.

**Performance and Sustainability**
PASCAL™ Technology helps manufacturers improve the energy efficiency performance of polyurethane insulation by up to 10 percent – without negatively affecting design or production cost. The Dow-patented technology uses any available blowing agent for appliance insulation, including the most environmentally friendly blowing agent, hydrocarbon, and is designed to help the appliance manufacturers meet anticipated government standards for energy efficiency.

**Dow and Haier – Committed to Energy Efficiency**
Dow and Haier are both industry leaders with the same strategic goal – to address energy efficiency through technology and improve sustainability in the products they produce.

“Both Dow and Haier are highly innovative companies committed to improving the energy efficiency of our products,” said Vanni Parenti, global appliance technology leader, Dow Polyurethanes. “As one of the world’s leading manufacturers of household refrigerators and major appliances, Haier has the potential to significantly impact greenhouse gas emissions through the implementation of this new technology.”

To learn more about PASCAL™ Technology and how it can contribute to your business, contact a Dow representative or visit our website at: www.dowpascal.com.

"The appliance industry is challenged to keep up with increasingly stringent energy efficiency regulations. With PASCAL™ Technology, we can meet or even beat those requirements without affecting performance, design or cost. It has proven to be an excellent solution for our business and for our customers."

Mr. Li Xiaofeng  
Business Development Director  
Haier White Goods