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Cannon V.A.I. - Vacuum-Assisted Injection Technology for Refrigerators Production - Provides Cost-Effective Eco-design and Superior Energy Saving

Cannon and DOW announced at the Shanghai Summit 2011 in Shanghai the first industrial mass production of domestic refrigerators manufactured with the new PASCAL™ technology, using the V.A.I. (Vacuum-Assisted Injection) method specifically developed by Cannon for the production of white cold appliances.

The Shanghai Summit 2011 gave the opportunity to Italian and Chinese government officials, academic and industry leaders and media to discuss innovative options for the conservation of energy and explore how transformational opportunities can contribute to economic growth and environmental sustainability.



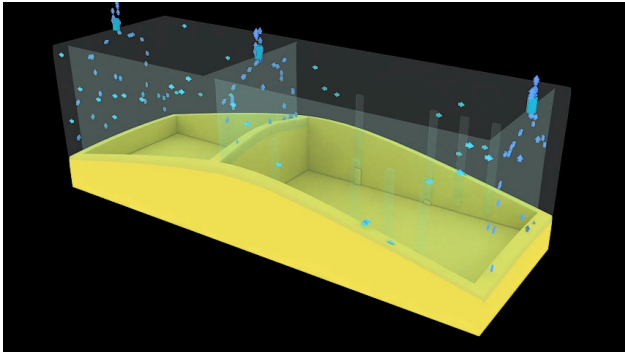
One hundred selected attendants were hosted for a full day meeting on September 9, 2011 in DOW's modern R&D Centre in Pudong, Shanghai.

Themes as the chemistry of DOW's PASCAL™ Technology, the Cannon Vacuum Assisted Injection dynamics, their industrial application at Haier, the commitment of Chinese and Italian Government's Agencies for the sustainable development of China, and the defence of intellectual property in China were presented with lectures held by qualified speakers.

A panel discussion among the top ranking representatives of DOW, Cannon, the Italian Ministry for Environment, the Chinese Household Appliances Association and members of the international Press concluded the event. Numerous personal contacts were held with the attending members of the Chinese and international refrigerator industry, all very keen to learn more about this innovative technology.

V.A.I. (Vacuum-Assisted Injection)

An injection method introduced in 1998 - applying vacuum into the mould cavity where insulated sandwich panels are manufactured with the discontinuous production process - the vacuum-assisted injection has now successfully been applied to the geometrically much more complex design of domestic refrigerators.



A controlled degree of vacuum is applied into the jig where an empty refrigerator cabinet is positioned, prior to the foaming operation. The reduced pressure applied into the cavity during the injection and the expansion of the foam facilitates the filling of the cabinet, providing substantial benefits:

- almost doubled productivity per foaming station, thanks to the possibility to use high reactivity formulations providing a faster demoulding time.
- optimized distribution of foam density throughout the whole cabinet.

A tight co-operation with The Dow Chemical Company allowed for the joint-development of PASCAL™, an innovative technological solution that draws new frontiers in the production of refrigerators. The new Polyurethane chemistry developed by Dow for this technology reduces the foam thermal conductivity to a new reference level, while maintaining the density within the industry-accepted levels and allowing for a shorter polymerization time.

Several patents have been applied by the two companies in their respective fields of activity.



The first industrial plant working with the Cannon V.A.I. technology is in located in P.R. of China, producing Class A++++ Haier refrigerators.

Featuring an electric consumption of 0.19 kwh/24 hrs (against an average of 0.30 – 0.40 kwh/24 hrs of comparable competitor's models) these domestic two-door fridges were officially launched in March 2011 at the World Appliance Expo in Shanghai.



Cannon have developed for this technology the new V.A.I. polymerization jig, in which the refrigerator cabinet is maintained under a controlled degree of vacuum during the whole period of the foam's injection.

A further technical development – the new RotoJig, a foaming fixture hosting two polymerization jigs mounted on the opposite sides of a rotating platform (picture, left) – allows for the reduction of the plant's floor space by 50% and to speed up the foaming cycle.

In order to produce a refrigerator characterized by the same thermal conductivity in all its components, the vacuum-assisted injection technology has been extended to the door's production method: the well known "Drum" Unit – a rotating multiple-mould manufacturing tool originally patented by Cannon in the early 1980's – has been redesigned applying the vacuum capability, obtaining for the doors the same advantages described for the cabinets.

This Press Release is also available in Chinese Mandarin, [at this link](#)