

Household Appliances: towards reduction in consumption



Technological and chemical innovations introduced with the project K-12 will help to create highly efficient models

The household appliances sector is one of the largest users of electricity in Europe, with about 29% of total consumption, 25% of which is used by refrigerators and freezers. The reduction of energy consumption, stimulated by EU legislation, has been addressed through an appropriate balance between the development of innovative models and new chemicals, on one the hand, and between these devices and their impact on the environment, on the other. Energy labelling has contributed signifi-

cantly by reducing the energy consumption of refrigerators and freezers by about 65% between 1980 and 2015; nevertheless, these consistent and continuous improvements have been cancelled out by the growth of the use of the appliances themselves. EU Directive 92/75 /EC and the subsequent 2010/30 / EU, has established a system of energy consumption labelling for household refrigerators that sets out an index of energy efficiency, the EEI, based on annual energy consumption, storage volume and device type. EEI is evaluated in classes from A to G on the label, where A is the most efficient. Categories A+, A++ and A+++ were then assigned to recognise additional improvement efforts made by the industry. The commitment of the appliance manufacturers is mostly focused on the areas of new insulation technologies (new polyurethane formulations, use of vacuum panels, improvements in the design of the seals, joints and reduction of losses or thermal bridges) and cooling circuits. All these measures have been implemented in accordance with the Montreal and Kyoto protocols, for the reduction of greenhouse gases and the hole in the ozone layer caused by the use of expansion agents and refrigerant liquid. In the light of this, Dow Italia, Whirlpool and Afros are partners of LIFE+ K-12 (LIFE13 ENV / IT / 001238), whose objective is the development of an innovative refrigeration technology to significantly improve the energy efficiency of refrigerators and dra-

stically reduce carbon dioxide emissions through their usage. The K-12 project involves the use of technological and chemical innovations that avoid the use of greenhouse gases as expansion agents such as polyurethane foam insulation for refrigerators, reducing the environmental impact of manufacturing operations, in compliance with energy and regional regulations. Dow, Whirlpool and Afros therefore started the K-12 project with the overall long-term objective of contributing to refrigerator energy-saving, demonstrating the feasibility of an innovative technological solution able to greatly influence the thermal insulation market and the entire cold chain. The K-12 project benefits from the experience of Dow, a leading global company in the field of science and technology, Whirlpool, the world's largest manufacturer of appliances, and Afros, a leading global company in polyurethane engineering and equipment, in order to radically innovate the production process of household refrigerators, insulated with a highly efficient microcellular polyurethane foam able to offer around a 30% reduction in thermal conductivity, thus significantly improving refrigerator and freezer energy consumption. The innovative technological processes for the production of the refrigerator K-12 are being developed by Whirlpool and Afros. For more information, visit: <http://www.dow.com/en-us/k-12>. **-V.P.-**



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