



# HOUSEHOLD APPLIANCES

## SOCIETAL IMPORTANCE

Throughout the world, household appliances such as refrigerators/freezers, room air conditioners, portable air conditioners and dehumidifiers are an integral part of today's home, adding convenience and comfort to the lives of their owners. Home appliances also are a success story in terms of energy efficiency and environmental protection. New appliances often represent the most effective choice a consumer can make to reduce home energy use and costs.

## Critical Application Considerations

Energy use has been significantly reduced in major home appliances, while at the same time features and capacities have increased. For example, household refrigerators/freezers provide convenient and safe food preservation and help improve quality of life, as well as reducing their impact on the environment. **A typical refrigerator uses 50 percent less energy than 20 years ago, while its average capacity in the US has grown 20 percent.** As these efficiencies have improved, the need for energy has diminished, helping to reduce emissions from power plants. The appliance industry also has moved to cooling and insulation systems that are much better for the environment because they are using non-ozone depleting substances that have lower global warming impact.

Refrigeration and home comfort products use refrigerant to remove heat (or water for dehumidifiers) from the air. Refrigerator/freezers also have thermal insulation that uses a "blowing agent" that is used to spray the foam to provide insulation qualities. Both refrigerants and blowing agents must be safe, and energy efficient substances.

Since the mid-1980s, these household products have made costly, **but environmentally beneficial transitions from CFCs, to HCFCs, and then to non-ozone-depleting compounds such as HFCs and very low global warming potential compounds such as hydrocarbons.**

## Environmental Considerations

In the past, a household refrigerator's environmental impact had been principally a result of energy consumption of the product. Over the last 20 years, significant gains have been made in energy efficiency. **Today, the appliance industry is using life cycle climate performance (LCCP) to evaluate the full environmental impact of the refrigerator. This not only takes into consideration its energy efficiency, but also the chemicals used in the refrigerant system, foam and foam blowing agents, manufacturing processes,**

**performance, durability, and end-of-life impacts.** The appliance industry has joined with Underwriters Laboratories Environment and CSA International to develop a set of sustainability standards for major appliances, beginning with refrigeration appliances. Through the use of sustainability standards, buyers are informed of the impacts on the environment. Manufacturers can use these standards to predict the impact of design changes on the full environmental impact of the product.

## Technology Trends

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**Environmental impact reduction opportunities exist by improving energy consumption.** This can involve both the quality of insulation and choice of refrigerant. In doing this, manufacturers must balance other environmental factors, such as recyclability, durability, and safety. **Today, there is much work being done to advance appliances to the next generation of environmental and energy efficiency benefits through the development of “smart” technology.** Smart appliances will be able to receive signals from the electric grid and automatically adjust operation to use energy in a more beneficial way from a system perspective. Vast amounts of energy could be saved by reducing electricity losses along congested transmission and distribution lines, reducing the number of power plants that will need to be built, and, most importantly, save the consumer energy and money.

Tremendous advancements have been made in the development of new materials used in refrigeration appliances over the last few years. Energy efficiency still remains a key demand driver for the overall environmental impact. Both the insulating qualities and the compatibility of chemicals are critical to providing a safe, reliable, and long-lived appliance to people around the world. We continue to look forward with new refrigerant and foam blowing agent materials. Refrigerators continue to be one of the most sought-after appliances in the developing world. They provide a significant change to the overall lifestyle allowing families to store foods at safe temperatures. These products provide a tremendous economic value for the individual family and society as a whole. **It is important to continue the development of materials that are safe, reliable, and outstanding values for the consumer.**



### **THE ALLIANCE** for Responsible Atmospheric Policy

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The Alliance is an industry coalition that was organized in 1980 to address the issue of stratospheric ozone depletion. It is presently composed of about 100 manufacturers and businesses which rely on HCFCs and HFCs.

Today, the Alliance is a leading industry voice that coordinates industry participation in the development of international and U.S. government policies regarding ozone protection and climate change.