

# around the HOUSE

## Universal Designed & “Smart” Appliances: Part 1

**Today’s industrial designers** may be leading the way when it comes to integrating universal design and green technologies. Appliance designers are embracing the realities of emerging aging populations and creating products that work for everyone. This is also referred to as “lifespan” design.

Universal design (UD) is closely associated with human-factors design. The focus is on human behavior and human interaction with space, with regard to form, scale, aesthetics, proportion, function, equipment, and furnishings. The idea is that the final product is designed for the user as opposed to the user being forced to accommodate the design.

Interestingly enough, human-factors design is modeled after the process the U.S. military uses for its products and facilities. The rigorous formula follows a step-by-step process. Perhaps ergonomics is even more closely aligned with UD when it comes to product design. Ergonomics has generally come to mean “making something easier and less stressful to use.” The common element is the assessment of psychological, physical, and social needs in all design projects. Industrial designers recognize the market need and opportunity to design

Design, “Design powerfully and profoundly influences us and our sense of confidence, comfort, and control. Variation in ability is ordinary, not special, and affects most of us for at least part of our lives.” Recognizing economic, environmental, and social design decisions and their impact on human behavior is a sustainable choice. New appliances are designed with all three of these intertwined areas of sustainable design.

Along with this awareness to “design for all” comes the environmental movement to save energy and water and lessen the impact on America’s aging utilities grid. Manufacturers are now developing smart

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for and focus on the needs of users. The growth of aging populations around the globe has established a clear call for UD.

Consumers also have this awareness of inclusive UD for all ages and abilities. As noted by Valerie Fletcher of the Institute for Human Centered

appliances that will talk to the national electric supply “smart grid.”

According to Dr. Henry Marcy of Whirlpool Corporation, this smart grid will create a demand response environment where energy reduction is systematically controlled across tens of



Ergonomics has generally come to mean “making something easier and less stressful to use.” An adjustable counter enables wheelchair users to better use their counter space. This homeowner also has easy access to the refrigerator.

thousands of homes at a time, providing automatic energy reduction without any inconvenience to consumers.

## Saving Energy & Water

In this and the next couple of articles, we’ll look at new kitchen appliances with a focus on their UD features and how each type of product is designed to save energy and water. We will also research the various label programs so you can properly identify appliances that have prequalified sustainable attributes.

We all have to eat, and since the refrigerator gobbles up more energy than any other appliance, it’s a good place to start. The new side-by-side refrigerator/

freezer units make it easy to access frozen and fresh foods without excessive bending. This is the obvious choice for wheelchair users. Another advantage for this population is that the doors do not swing out as far, making them easier to navigate around and taking up less precious real estate in the kitchen.

Select units have clear pullout shelves, drawers, and tilt-out door bins that allow easy viewing of contents and bring hard-to-reach items closer to users. Full-height handles on the doors make opening them a breeze for people who are tall, short, or seated. New under-the-counter or drawer-type refrigerators make it easy to place food items within reach. These are, however, expensive units, but they may be the right choice and serve as a great secondary unit, which is sometimes in a separate location such as the family room, wet bar, etc.

The drawback to these units is that the design with the freezer on top is more energy efficient. Design solutions and appliance selection versus cost, etc., will require tradeoffs, but in this case easy access to all of the family food reigns supreme in my opinion.

## How Much Do You Use?

In the average home, a refrigerator runs 24 hours, 7 days a week. According to data from the U.S. Department of Energy, they account for 8% of the total annual household energy expense. In the 1970s the units averaged 1,800 kilowatt-hours (kWh) per year, while the best models today use only about 500 kWh annually.

Refrigerators and freezers with individual compressors generate only the energy required to keep their own com-



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partment properly chilled. Adaptive defrost systems operate only when needed, and settings adjust temperatures for low food levels. They can also disable ice-making and lighting when users are on vacation and can function in sleeping mode similar to your computer. This means lights, fans, sounds, compressors, or other electrical activity is disabled when the door is opened and without affecting the unit's operation.

All refrigerators sold in the U.S. are required to meet the Department of Energy's efficiency standards, and many meet the more stringent Energy Star™ qualifications as well. A new refrigerator with an Energy Star label is required to use at least 20% less energy than stipulated by current federal standards. The models of today use about half the energy of those manufactured prior to the 1990s.

Using common sense goes a long way in saving energy. Decide on refrigerator placement early in a new design plan and keep it away from the oven, out of direct sunlight, or not too close to the dishwasher. Leave a space between

the walls and the back of the unit to allow air to circulate, and keep the bottom coils clean. Make sure the door seals are tight, and replace them on older units. Efficient storage organization decreases the time needed to find items inside.

All of this reminds me my girlfriend says my refrigerator needs some spring cleaning—she prefers a spotless refrigerator. Oh, joy; I'd better keep my day job.

Next month we will continue looking at UD smart dishwashers, cooktops/ovens, and other new options in the kitchen. In the future we will also look at bathroom

units and overall space planning in both.

The plan book *Universal Designed "Smart" Homes for the 21st Century*, which I wrote and designed, is still available to readers at a \$5 discount by using coupon code: Vethomes. It contains not only floor plans but also 25 pages of room-by-room features and benefits that will help you with overall space planning for universal design and smart homes and remodels. It is available at [www.UniversaldesignOnline.com](http://www.UniversaldesignOnline.com).

*Note:* The cost estimate of \$1,400 for a single-run stairlift as noted in the June 2010 article should be \$3,300–\$5,000 for product *and* installation. I apologize for the error.

Contact me with comments or article suggestions at [CharlesSchwab@UniversalDesignOnline.com](mailto:CharlesSchwab@UniversalDesignOnline.com). ■

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