

A New Spin on Laundry Day

By Glenna B. Musante





Traditionally, the cycles and steps involved with doing a load of laundry have been predictable and not very complicated. But just as new technologies have changed how people work and communicate, new laundry machines and detergents have become increasingly sophisticated and complex to use.

Within the last 10 years, laundry machines have changed dramatically. This has been largely driven by regulations in countries such as the United States mandating that new machines use less energy and water than previous models. New laundry machines, and new detergents for both commercial and residential machines, have emerged to meet those mandates. This in turn has reconfigured the standard algorithm that equals a well-washed load with minimal dye bleed and fiber abrasion.



Less Water, More Issues

Since around the 1980s, says Elizabeth Easter, a professor at the University of Kentucky, energy efficiency has been “the number one driver” for both industrial and residential laundry machine design change. But now, she says, both platforms are developing machines that use less water, as well as less energy.

For both residential and commercial platforms, this means more cold water wash loads, a new generation of detergents formulated to perform in cold water, and a host of other factors impacting laundry efficiency.

In the past, a typical consumer washing machine would use from 40 to 45 gallons of water per wash load, says Celia Kuperszmid-Lehrman, deputy home editor for Consumer Reports, but today’s new machines use about half as much water. Some new models even use as little as 10 gallons of water for a load of laundry.

Commercial washing machines have always used significantly less water per pound of clothes than residential top loading washers, says Easter. “We don’t see as much of the drive to reduce the amount of water [in that market], but there is a drive to lower the temperature of [the] water.”

To that end, she adds, “we no longer see commercial laundries washing at 200° F and 180° F. Even for work wear, we have seen a reduction in the wash temperature, which basically requires some changes in the detergent industry to accommodate the removal of soils that traditionally would dissolve in higher water temperatures.”

Easter adds that in both residential and commercial laundry machines, “we see a significant increase in the extraction speed” of water during the spin cycle. In commercial machines this is referred to as G-Force. Extraction speed in consumer washing machines is typically referenced as RPMs, or revolutions per minute.

“Traditionally, we would see commercial extractors using 200 G-Force in the spin cycle,” she says, “but now we see a much higher G-force...up to 400 Gs, and sometimes beyond that.” That has led to overall energy savings, “because if you extract [moisture] at a higher spin speed, you extract more moisture from the load and clothes will dry faster in the drying operation.”

There is a downside to increased water extraction with residential laundry, she adds. Now that clothes are leaving the washing machine drier than in the past, “timed drying may [now] actually be over-drying clothes,” she says, which can result in significant surface damage.



A New Wash Day for Testing

With so many changes taking place, test methods for colorfastness, wash durability, and laundry efficiency will be need to be adjusted to account for the changing wash day algorithm.

Says Kuperszmid-Lehrman, consumers may not be up to speed on how to use the new detergents. “There’s a real need for consumers to be educated to the changes that are taking place with both machines and detergents. A re-education process is needed.”

Meanwhile, she adds, organizations such as AATCC that establish test methods for laundering will be facing a dilemma. “They need to decide whether they should base their tests on how consumers are actually doing their laundry, based on [old] laundry habits that go back to the 1980s, or create tests that are based on how the new machines and new detergents work.” The latter approach, she says, assumes consumers “are up to speed on the new machines and the new way of doing things.”

The current AATCC Test Method committees that apply to laundering include RA42, Dimensional Changes Test Methods, and RA60, Colorfastness to Washing. According to Diana Wyman, AATCC’s technical director, the accelerated laundering method previously used to reference both home and commercial applications now only applies to home laundering. Other AATCC Test Methods that apply to washers and dryers are 88B, 88C, 124, 130, 135, 142, 143, 150, 172, 179, and 188.

The current AATCC Wash Cycle for Home Laundering Machines guideline applies to US and Canadian standard top load models, and high efficiency top load machines, using a normal cycle with warm wash.

Future plans include developing test methods based on front load and international models, as well as temperature adjustments and additional wash cycles.

An AATCC committee was established to create a consistent set of laundering test conditions that reflect what are described as “changes in consumer practices in the past several years as a result of energy conservation measures and changing lifestyles.” More about this can be found in AATCC Monograph M6, “Standardization of Home Laundry Test Conditions,” dated July 31, 2013. This is AATCC’s most recent monograph on this topic.

Meanwhile, AATCC members interested in this topic are invited to join one of the relevant AATCC committees, including RA88, Home Laundering Technology.

Manufacturers are compensating for this with dryers that can sense the moisture content of a load of laundry. As Easter explains, “in sensor dry [machines] in both platforms, the dryer itself has the ability to stop before it over-dries.”

New Consumer Laundering Trends

Both Easter and Kuperszmid-Lehrman noted that front load machines have become increasingly popular with residential consumers. Traditionally, consumers in the United States have preferred top load washer and dryers. Today, however, front loaders account for as much as 20% to 30% of the market, Kuperszmid-Lehrman says.

Front loaders, which do not use a central rotary agitator, may also be gentler on clothes. In addition, front loaders have higher spin speeds and as a result, extract more water than top loaders. The downside, however, is that front loaders take more time to wash a load of laundry than top loaders.

Other changes on the residential side include the introduction of increasingly sophisticated computer technology that allows consumers to manage washer and dryer cycles from remote locations, including one's work computer.

Easter says another significant laundering change is the fact that most care labels now call for washing items in cold or warm water, rather than hot. In addition, there may be more color exchange on white clothing and linens because, with fewer white items on the market, consumers may be washing the whites they own with colored laundry.

Not Your Grandma's Detergent

Detergents have changed as well. Traditionally, a cup of powdered detergent was used to wash a typical load of laundry in a residential top load machine. But today's consumers have moved away from powders. Now an estimated 75% of consumers use liquid detergents, or detergents packaged in so-called pods.

At the same time, detergent concentrations have changed significantly, with increased concentrations resulting in a reduction in quantities of both detergent and laundry additives becoming the norm in today's consumer markets.

Detergent scents have changed as well. “The industry has done a good job of moving beyond the



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traditional ‘April Spring Fresh’ scent for laundry,” Easter says, with detergent makers offering multiple scents, as well as detergents that are fragrance free.

Looking Forward

Easter and Kuperszmid-Lehrman both indicated that doing the laundry will continue to become increasingly sophisticated. The variables that go into doing a load of laundry are changing and will continue to change, she says, “as manufacturers experience pressure from regulating bodies to have improved energy [savings] and water consumption,” as well as increased consumer expectations.

Bottom line?

Consumers need to take the time to learn how to use today’s sophisticated machines, as well as the new detergents. Meanwhile, the industry needs to adjust its test methods to keep up with changing laundering and detergent technologies, plus figure out how to accurately assess the consumer learning curve.

Many consumers, Kuperszmid-Lehrman adds, “just want to do their laundry and get it over with and are not looking for any sort of complicated process. In other words, they aren’t reading the instructions.”

It all adds up to a complicated new laundry day.



The Washing Machine of the Future

This January, Whirlpool announced its next-generation Smart Top Load Washer and Dryer, which includes home and away, or remote access, controls. These controls, according to a company press release, “help prevent wrinkles and delay cycles when energy costs are high.” The company’s new top load machine can also go to quiet mode via the Whirlpool Mobile app.



Looking even further into the future, GE’s industrial design team has created a number of innovative appliance concepts for what the company calls “Home 2025.” This includes new laundering technology that looks very different from today’s technology.

Water scarcity was a leading concept for the design team behind “Home 2025,” and one of the key themes for the future was the need to reuse so-called “gray water” by both laundry and dish washers. In addition, GE’s washing machine of 2025 washes, dries, and then stores cleaned clothing in compressed pellet form, which can be revived as needed. According to material from GE, “commercial, public compressors, and revivers [will be] found on many common areas around the city.” Compressed laundry items would be designed to save space, eliminate folding, and make it easier to keep spare clothing at work or in the gym bag.

Presumably, clothing pellets would also reduce or eliminate those pesky baggage fees many airlines now charge.