



A teal towel swaddles a newborn infant. Image Credit: Unsplash user Sean Roy

There isn't a household in America that doesn't have a towel. Most have several. It's a ubiquitous item; across the world people get wet and need to get dry. The practical and psychological importance of the towel is immortalized in this passage from Douglas Adams' *The Hitchhiker's Guide to the Galaxy*:

A towel, it says, is about the most massively useful thing an interstellar hitchhiker can have. Partly it has great practical value. You can wrap it around you for warmth as you bound across the cold moons of Jaglan Beta; you can lie on it on the brilliant marble-sanded beaches of Santraginus V, inhaling the heady sea vapours; you can sleep under it beneath the stars which shine so redly on the desert world of Kakrafoon; use it to sail a miniraft down the slow heavy River Moth; wet it for use in hand-to-hand-combat; wrap it round your head to ward off noxious fumes or avoid the gaze of the Ravenous Bugblatter Beast of Traal (such a mind-bogglingly stupid animal, it assumes that if you can't see it, it can't see you — daft as a brush, but very very ravenous); you can wave your towel in emergencies as a distress signal, and of course dry yourself off with it if it still seems to be clean enough.

More importantly, a towel has immense psychological value. For some reason, if a strag (*strag*: non-hitch hiker) discovers that a hitchhiker has his towel with him, he will automatically assume that he is also in possession of a toothbrush, face flannel, soap, tin of biscuits, flask, compass, map, ball of string, gnat spray, wet weather gear, space suit etc., etc. Furthermore, the strag will then happily lend the hitchhiker any of these or a dozen other items that the hitch hiker might accidentally have "lost." What the strag will think is that any man who can hitch the length and breadth of the galaxy, rough it, slum it, struggle against terrible odds, win through, and still knows where his towel is, is clearly a man to be reckoned with.

— Douglas Adams, *The Hitchhiker's Guide to the Galaxy* ¹

For towel manufacturers, the importance of towels in everyday life is overwhelmingly good news. Towels are big business. Demand for towels is consistent; as a staple item, towels are purchased at a relatively stable rate. The downside, if it can be called that, is that to compete, towel manufacturers must produce enormous amounts of towels for very large customers. Whether their towels are sold via big-box retail stores such as Target or Walmart, online via Amazon or through national and regional distributors to smaller stores, towel manufacturers must be able to produce huge amounts of identical towels. As such, strict quality control measures are essential throughout the manufacturing process. When it comes to color, spectrophotometers play a central part in ensuring consistency.



Towels come in many colors and designs. Image Credit: Unsplash user Mike Meroz

Color Quality Assurance Processes Reduce Off-Goods

Customers expect consistency, whether they are buying two towels or 200. Towels that don't meet specifications cannot be sold at regular price and must be disposed of or sold at a [reduced price as off-goods](#), which can result in significant economic losses. Further, a high percentage of off-goods can compromise customer satisfaction as well as brand reputation. If shipments are delayed due to the need to make up work or if clients receive shipments which do not meet specifications, they may consider seeking another manufacturer. After all, with such a large market for towels, there are many, many towel manufacturers, each one ready and willing to take business from their competitors.

One of the simplest ways to lose a batch of towels to off goods is to fail to meet color specifications. Whether a towel is printed or dyed, each towel made to a certain design must fall within the design's established color tolerances. If a batch should fail to do so, it must be sold at the reduced off-goods price. If the batch should make it all the way to the client before being rejected for color, extra costs will be incurred. For this reason, towel manufacturers make color quality control a principal part of their quality assurance processes.

Many factors during the dyeing or printing process can cause accidental off-coloration. If color standards are communicated improperly, a manufacturer will end up producing towels to the wrong

specification. The physical attributes of the towel cloth can make a difference as well, as linen, cotton, terry, synthetics, and other towel cloths all react to dyes in unique ways and print with differing degrees of color fastness. Natural and synthetic dyes, as well as different color dyes, have [differing degrees of fastness as well](#). The formula for producing a teal towel on terry cloth will be different than on linen. This is complicated by blended fabrics and the dye mixes needed to produce unique colors. Furthermore, simple mistakes during the dyeing process, such as poor temperature control, water impurity, clogs or residue in the supply lines, or residue in the mixing vat, can all lead to discoloration as well. Finally, if the process is automated, simple computer errors can cause improper coloration. To prevent color irregularity, manufacturers must regularly and consistently [test the color of their towels](#).



Towels are a regular part of everyday life. Image Credit: Unsplash user Dan Gold

Spectrophotometers Prevent Waste

The ideal instrument for testing the color of towels rapidly and accurately is the reflectance spectrophotometer. These instruments assess the color of objects by bouncing controlled bursts of light off samples and analyzing the reflections. A sample can be measured in five seconds or less with unerring accuracy. By testing towel samples from test batches, manufacturers can determine whether a full production run will produce towels of the proper color. Samples can also be tested during the full run to be sure that the towels are consistently coming out the right color. Finally, samples can be tested after the towels are dried, cut, and packaged to be shipped to be sure that every batch sent to the client is within color tolerance standards.

While the use of spectrophotometers is easy to learn, any tool is [only as good as its user](#). The flexible, porous nature of towel textiles can create measurement difficulties if not properly controlled for. To ensure proper measurement, a backing should be placed in the compartment behind each towel sample. This is to reflect any light that passes through the towel itself. Naturally, the backing should be the same color and material for each usage. Also, towels, like most textiles, are flexible by nature. As such, samples should be secured to ensure they don't bend or pillow into the observation port. [Proper technique informs proper measurement](#).

Another benefit of spectrophotometers is that they improve color communication. No matter how flawless a manufacturer's color quality assurance is, if the desired color hasn't been communicated correctly, they risk producing the wrong color towels. Spectrophotometers allow for exact communication thanks to their [numerical identification of color](#). Human descriptions of color, such as "blue," "mauve," or "sunset orange" are fuzzy and imprecise. By contrast, spectrophotometers communicate color in tri-variable numerical sets, identifying each shade with decimal accuracy. This clarifies all communications both internally and externally and ensures color standards stay exactly the same across time.

The HunterLab Difference

With 65 years of color measurement expertise, HunterLab is the leading name in industrial spectrophotometry. Our instruments are used in textile production facilities across the nation and the world owing to their reputation for accuracy, ease of use, and versatility. [Contact us today](#) to learn which spectrophotometer would be ideal for your towel production facility.

1. "Towel Day," May 2017, https://en.wikipedia.org/wiki/Towel_Day