The Science
Behind the Standards

By Stuart Mann & Eric Yeggy

The life-cycle approach to creating sustainability standards

There is a buzz of excitement throughout the industry surrounding the Water Quality Assn.'s (WQA) Sustainability Standards. The development of these standards was sparked by the WQA board of governors, which tasked the association with finding a proactive way to promote sustainability and environmental awareness across the entire drinking water treatment sector. This torch was eagerly taken up by industry volunteers, with task force ranks eventually growing to represent more than 50 WQA members and stakeholders. Retailers, utilities and universities also contributed to the effort, demonstrating the growing demand for sustainable water treatment products.

WQA S-801: Sustainable Management covers corporate-level responsibilities, WQA S-802 covers product sustainability for raw activated carbon and WQA S-803 currently covers product sustainability for activated carbon water filtration systems, but is undergoing expansion to cover additional drinking water treatment products such as reverse osmosis units, ultraviolet disinfection and coolers/dispensers.

Shortly after publication of the new standards, several manufacturers began working with WQA on certification projects. In October 2013, 3M Purification Inc. became the first company to receive the WQA S-803 certification, and a few months later Kuraray Chemical Co. Ltd. became the first to receive WQA S-802.

In November 2013, the American Society of Plumbing Engineers (ASPE) agreed to sponsor these standards for adoption by the American National Standards Institute (ANSI). Upon adoption, the new standards will be designated as WQA/ASPE/ANSI standards.

Looking at Life-Cycle

Early in the standards development process, WQA commissioned an environmental consulting firm, PE Intl., to provide scientific analysis of the sustainability of drinking water treatment products. Although the term sustainability is associated with more than one definition, WQA chose to define a sustainable water treatment product as "one that meets the needs of the present without compromising the ability of future generations to meet their own needs." This involves evaluation of social, environmental and economic aspects (people, planet and profit).

PE Intl. utilizes a distinctive approach, collaborating directly with industry members to evaluate the life-cycle of a product from "cradle to grave," encompassing all phases of the product's life-cycle, from raw material acquisition to end-of-life disposal.

PE Intl. does not limit its analysis to industry member collaboration; it draws data from multiple sources, including:
- Publicly available life-cycle analyses (LCAs) and reports;
- Confidential manufacturer LCAs;
- Component data/information;
- Process data/information;
- Academic studies;
- Industry reports;
- Interviews with WQA members, manufacturers and key stakeholders; and
- Other product/sustainability standards.

The aggregate data are used to generate a heat map, which identifies the major environmental consequences, or environmental hot spots. The WQA sustainability standards are focused on these hot spots. This type of rigorous scientific approach is necessary in order to deliver a significant reduction of environmental footprint with a minimal cost to the industry and the consumer.

Using this comprehensive scientific approach, the WQA standards establish a credible, achievable threshold for sustainability, while still allowing manufacturers the flexibility to design their own environmental solutions. This flexibility is achieved using a points-based approach to assessing

conformance with the standards by assigning a points value to each criterion and then setting a minimum threshold to pass (with certain subsections that represent the critical hot spots also assigned minimum thresholds).

This system optimizes the use of the life-cycle approach (embodied within the heat maps) in order to assign the appropriate weighting of points for the various criteria, without dictating precisely how manufacturers should reduce environmental footprint. Thus, manufacturers are able to work within the standards to tailor the best environmental solutions for their companies, while still meeting customer needs.

The standards include mandatory prerequisites for key product attributes necessary to ensure credibility with consumers and regulators. For example, the value proposition with the customer is a critical economic attribute that must be considered when evaluating sustainability. An ostensibly green product that does not work or is unsafe will quickly end up in a landfill. Therefore, the WQA sustainability standards also require products to be certified against a standard that ensures materials safety, structural integrity and performance (when applicable).

WQA S-801 was established as a prerequisite to ensure basic corporate responsibilities, and is used to evaluate many of the social aspects of sustainability. For example, it enforces commonly accepted fair labor practices and includes sections on corporate sustainability policies and reports, as well as working with suppliers.

WQA S-802 and WQA S-803 also include mandatory prerequisites to ensure manufacturing operations comply with statutory and regulatory requirements for the jurisdictions in which they are located, and to ensure that product labels comply with relevant jurisdictional regulations governing environmental claims, such as the U.S Federal Trade Commission's Guides for the Use of Environmental Marketing Claims.

The First Standards

During the development of WQA S-803, the manufacture of activated carbon was identified as the major

Figure 1. Hot Spot Analysis for POU Carbon Filter Systems

	Raw Materials	Manufacturing/ Assembly	Packaging/ Transport	Use	End-of-Life
Air	High	Medium	Medium	Low	Medium
Climate Change	High	Medium	Medium	Medium	Medium
Living Resources	Medium	Medium	Low	Medium	Low
Non-Living Resources	Medium	Medium	Medium	Medium	Low
Water Impact	Medium	Medium	Low	Low	Medium
Human Health	Medium	Low	Medium	Medium	Medium
Community	Low	Medium	Medium	Low	High

■ High impact/priority   ■ Medium impact/priority   ■ Low impact/priority

environmental hot spot for carbon filters (see Figure 1). Therefore, a significant percentage of the points available for carbon filters is targeted toward the sourcing of more sustainable activated carbon. In addition, extra points are awarded within WQA S-803 if the filter manufacturer sources activated carbon that is certified to WQA S-802, illustrating how the standards build on each other to leverage increased sustainability within the sector as a whole.

Additional sections enumerated in WQA S-802 and WQA S-803 include:

• Responsible raw material sourcing;
• Sustainable product design;
• The following manufacturing process impacts: energy consumption/conservation, greenhouse gas emissions, water consumption/emissions, air emissions, and solid waste outputs;
• Sustainable packaging;
• Recycling/end-of-life management; and
• Innovation.

This approach results in a set of standards that is simple and easy to use. The standards feature a single level of compliance (pass/fail) for all applicable products, which can be easily understood by consumers who wish to use this certification to evaluate products and make informed purchases.

Sustainability is more of a journey than a destination, and embarking on this journey does require some initial investment of resources. However, most sustainability initiatives actually produce a positive return on investment over time. This is because, in practice, sustainability is largely about reducing waste and improving efficiency. Therefore, these efforts usually result in some or all of the following longer-term cost savings: raw materials, energy and water consumption, manufacturing/productivity, occupational health and safety, waste disposal, hazards management, regulatory compliance and reduced risk (financial/liability/regulatory), plus enhanced public relations and innovation. So, in addition to the obvious marketing advantages this certification confers, it also provides the impetus to accomplish positive changes to the business practices of the manufacturer. Thus, the cost of this certification should prove to be a worthwhile investment.

Meanwhile, the following are the basic steps that a company should take to get started on the path toward a more sustainable future, and to ensure a smooth certification process:

• Implement a corporate-level sustainability policy;
• Establish a baseline inventory of all current environmental impacts;
• Implement programs, objectives and targets to manage environmental performance;
• Monitor environmental performance over time; and
• Implement corrective actions to improve achievement of objectives and targets. *wqp*

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