

\$9.00

# Cleaning & Restoration™

December 2007 • Vol. 44 No. 12

Published by the Restoration Industry Association

## Stepping Out in Grapevine *Texas Hosts RIA's Annual Convention*



### Inside:

---

**Oil Painting  
Restoration**

**Mixing Science  
and Carpet Cleaning**

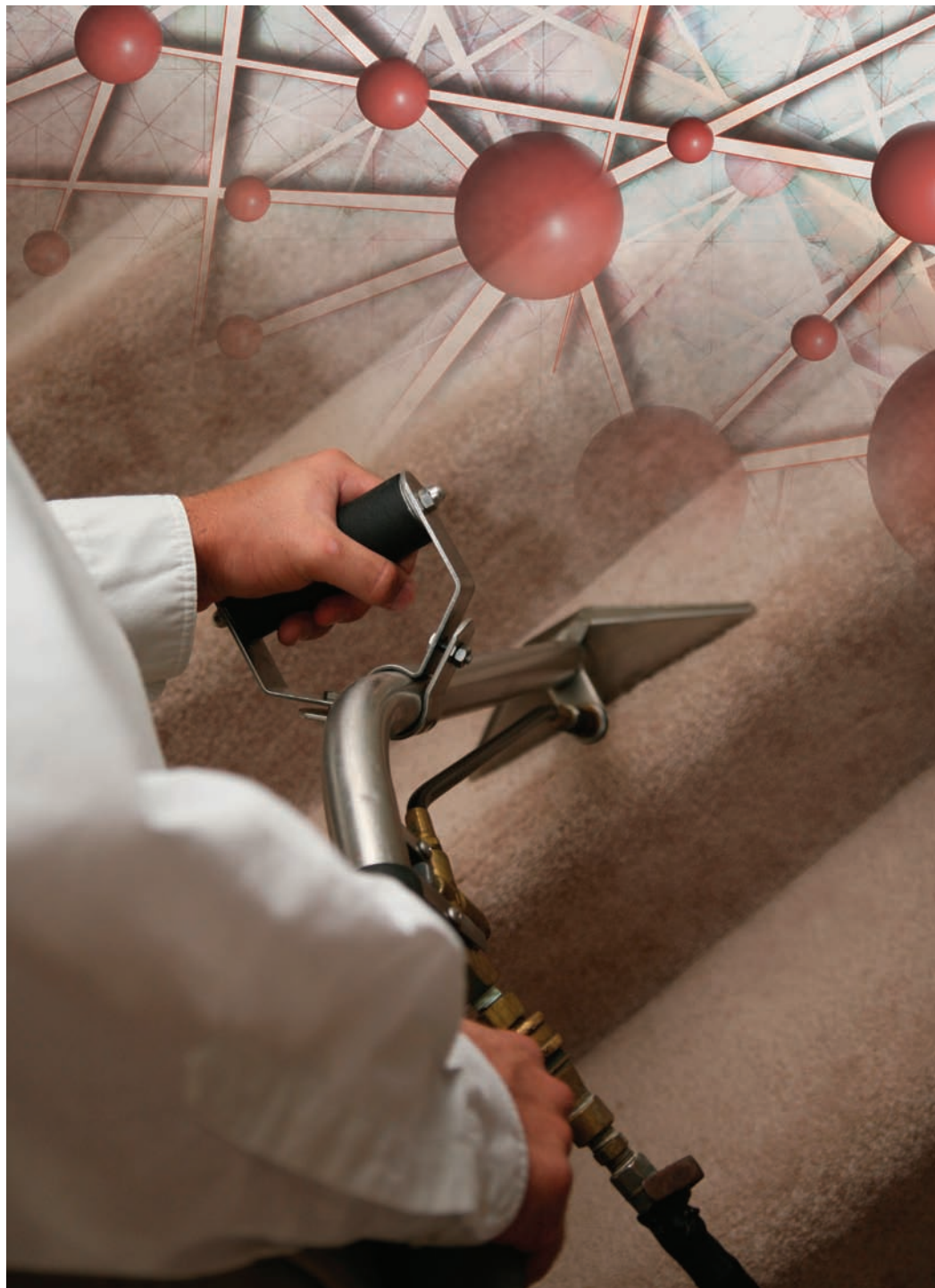
**Building Brand  
Awareness – Part 2**

# Bringing Science into Carpet Cleaning

By Steve Williams

Education and science have made major inroads into carpet cleaning in just the past few years. One of the most significant advances was the introduction of XRF technology, which stands for X-ray fluorescence analyzer technology. The system was first used by NASA in an attempt to locate minuscule cracks and flaws on space shuttle components so they could be repaired before takeoff. This is why we often hear it described as “space-age” technology. However, as with so many new inventions, it was found to have other applications as well, and one of them was looking for soil in carpet fibers.

The technology is so powerful that it can actually determine the type and amount of soil found in carpets before and after cleaning. According to the inventor, Lloyd Starks, “Every atom has a fingerprint of sorts, and XRF reveals those fingerprints even when they are soils.” This is why the Carpet and Rug Institute (CRI) has adopted the technology as the foundation for its Seal of Approval (SOA) program, which was introduced at the Kennedy Space Center in September 2005.



The goal of this independently run program, according to CRI, is to “identify effective carpet cleaning solutions and equipment that clean carpet right the first time and protect a facility’s carpet investment.” Based on XRF test results before and after extraction, carpet extractors that meet certain criteria earn a bronze, silver or gold certification. This helps cleaning professionals and facility managers select

more effective cleaning equipment that has been tested for proven performance.

Another major cleaning-related scientific milestone was recently reached when the first Cleaning Industry Research Institute (CIRI) symposium was held in May 2007. The program addressed the need to bring more science and education into cleaning through a better understanding of how cleaning chemicals, methods, tools and equipment work to remove “unwanted

matter.” With such notable presenters as Michael Berry, Ph.D.; Steven Spivak, Ph.D.; Marilyn Black, Ph.D.; Eugene Cole, Ph.D. and Elizabeth Scott, Ph.D., the symposium’s primary goal was to help identify science-based solutions that improve the effectiveness of cleaning—helping to protect health and the indoor environment.

The symposium addressed and studied a variety of cleaning systems and techniques, including carpet cleaning, indicating which methods can be scientifically proved to be most effective. No specific brands, products or manufacturers were addressed.

For instance, one of the presentations compared the encapsulation method of carpet cleaning to hot-water extraction. The goal was not necessarily to say that one system was “better” than the other. Instead, it was to show how applying science, in this case the use of XRF technology, can be used to evaluate a cleaning system and what can be learned from the results.

## Encapsulation

The encapsulation system, which first generated considerable attention about three years ago, uses chemicals and detergents to “surround” soils in the carpet fibers and crystallize them so that they can be removed by vacuuming. Carpets cleaned with encapsulation dry quickly. This is why medical facilities, schools, airports and other locations that are open 24 hours per day or need carpets to dry as quickly as possible after cleaning have been especially enthusiastic about the system. And because little moisture is involved in the encapsulation method, there is little chance that mold or mildew can develop, helping to protect indoor air quality.

Other pluses for the encapsulation method are that the equipment used tends to be inexpensive when compared to other equipment used for carpet cleaning, and the entire cleaning process can be faster, adding to its cost effectiveness.

Additionally, it can be used on almost all types of carpets and requires less worker training and skill than other types of carpet cleaning methods.

However, is it effective? How does it compare to hot-water extraction as far as cleaning effectiveness? Can it be used as a stand-alone carpet cleaning system?

A recent study conducted by Shaw Industries, the largest carpet manufacturer in the world, and presented at the CIRI symposium by Carrey Mitchell, the company’s technical director, set out to answer these and other questions regarding the encapsulation method. It proved to be an excellent example of how science can be used to evaluate cleaning and what cleaning professionals and facility managers can learn as a result.

## Scientifically Evaluating Carpet Cleaning Methods

Carpet samples with equal amounts of soil specimens were cleaned as many as 19 times by simply vacuuming the carpets, using the encapsulation method only, using hot-water extraction only or using a combination of all methods. To prevent the possibility of cross contamination, different vacuums were used. More than 500 measurements using XRF technology before and after cleaning were employed.

The results showed that the encapsulation system, although it may have many benefits and features as outlined earlier, may not be the most effective way to clean carpets. The Shaw study found that soil levels left in carpets after using this system were considerably higher than levels when using hot-water extraction. Researchers also found that the appearance of the carpet after encapsulation was not as good as when using the extraction method.

The study concluded that encapsulation can be a useful and viable carpet cleaning system *if* it is supplemented with hot-water extraction. The study reported that it is not viable as a stand-alone carpet cleaning system, as it is used in some facilities.

The study suggested cleaning professionals and facility managers consider an “alternating” carpet cleaning program in which carpets are cleaned once or twice with the encapsulation system, followed by hot-water extraction the next time. This helps take advantage of the key benefits of the encapsulation system—fast drying and cost savings—while keeping soil levels low and carpets clean and healthy.

## What Was Learned

This study highlighted several things and proves how cleaning effectiveness can be improved through the application of science. First, the encapsulation method is useful, but when used with hot-water extraction. At the symposium, Mitchell suggested the encapsulation method can be used two or three times before hot-water extraction is necessary, allowing facilities a quick and easy interim way to keep carpets clean.

Next, it proved the viability of XRF technology and methodology. There is currently no other system for evaluating carpet cleaning as quickly and effectively as XRF, proving its value to the industry.

Additionally, it helped the manufacturers of carpet cleaning equipment to better understand how effective their equipment is and allowed them to re-engineer their products to make improvements.

Historically, the goal of the industry has been to clean for appearance to keep customers’ locations looking in tip-top condition. However, developing accurate and measurable cleaning standards and ways to measure cleaning’s effectiveness by applying science appears to have a lot of validity and ultimately will be a positive direction for the professional cleaning industry. Science answers the “how” of cleaning so that cleaning can be more effective, thus protecting the health of cleaning workers, building occupants and the indoor environment. ■

*Steve Williams is senior vice president of research and development at U. S. Products, a manufacturer of carpet, floor and restoration cleaning equipment.*