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A Superhero of Testing: Our New XRF

If you think our “XRF” sounds like a superhero able to achieve amazing feats with its unique “powers,” you’d be on the right track. While it may not have a fancy costume or be able to leap tall buildings in a single bound, our newest XRF is a superhero in its own right, a 24-hour-a-day, seven-days-a-week machine that can accomplish more in an hour with its X-ray “vision” than some machines can do in weeks.

As with most superheroes, there’s more to the XRF than meets the eye, of course. First, while this X-ray fluorescence (XRF) unit, shown in the photograph below, may look unassuming, it’s a giant in the sophisticated end of analytical equipment. Using XRF analytical methods, samples of a minimum size are bombarded directly by X-ray radiation, and the reflected or scattered radiation



One of Bowser-Morner’s skilled technicians carefully prepares the samples as needed for the precise XRF analytical testing.

is then evaluated as secondary emissions that are characteristic of the given elements. Since all chemical elements have unique secondary emissions, trace elemental concentrations can be quantitatively assessed, and the product compliance can be determined.

This type of testing is ideal for limestone analysis with more than 2,200 samples tested so far. Most of these tests were “full” limestone elemental analyses for calcium as calcium carbonate, magnesium as magnesium carbonates, aluminum as aluminum oxide, iron as ferrous oxide, silicon as silicon dioxide, and sulfur.

Still, as useful as this XRF unit is for our clients who need multiple limestone analytical results in what seems like a mere blink of time, this XRF is no one-dimensional wonder. Its capabilities also include testing to determine the geological makeup of rocks and soils using the XRF’s special GEO-Quant and determining the makeup of petrochemicals using the Petro-Quant software. In addition, in keeping with our commitment to meeting our clients’ needs for even their most unique situations, Bowser-Morner has created several applications to analyze metals for “exotic” elements like yttrium and bismuth, or, occasionally, aluminum, copper, brass, and other metals that clients want a fast “read” on.

This new XRF unit also saved the company--and our clients--more than one man-year of time this past fiscal year. More importantly, this safer, cleaner method of testing has kept us from having to use several thousands of dollars worth of reagents and prevented us from exposing laboratory personnel to the dangers that always are present when wet chemistry methods are used.

The safety benefits don’t end in our own laboratories, either. With the recent increase in concern about the presence of hazardous materials in items used to make other products, the XRF is ideally suited to help clients who want or need their materials pre-screened for lead, chromium, cadmium, and mercury. That testing is in keeping with the “RoHS Directive” prepared

“Safety First” Efforts Earn Awards

At Bowser-Morner, we work hard to always think of “Safety First.” It’s good for our employees and good for our clients. Recently, this commitment to safety in the workplace and on our clients’ sites paid off in an “award-winning” way.

During a recent meeting, Bowser-Morner received several awards from the Ohio Bureau of Workers' Compensation and the Miami County Safety Council. Thanks to the safety efforts of our employees and company, Bowser-Morner received the 2008 Award for Outstanding Safety Performance in the "100% Award" and a 2008 Special Award for operating without a lost-time accident from July 20, 2005 to December 31, 2008 with 1,165,879 hours worked.

We couldn't be prouder of these awards, especially since we know that accomplishing these safety goals takes some of the same things needed to serve our clients well: hard work, careful planning, and great attention to details. Although thinking about safety first takes a little extra time and effort from all of us, those endeavors pay off in a big way for everyone from our employees to our customers. At Bowser-Morner, the message is clear: When we think “Safety First,” we all win.



A Message from Steve Bowser

As President of Bowser-Morner, I'm proud that we've been serving you, our valued clients, with the same strong commitment to excellence since 1911.



STEVE BOWSER
PRESIDENT, BOWSER-MORNER

If you have any questions, comments, or suggestions about how we can better serve you, please feel free to email me at sbowser@bowser-morner.com or call me at 937.236.8805, Ext. 202. Thank you.

Bowser-Morner's Dick Hoppenjans New Diplomat

Congratulations to Mr. Dick Hoppenjans, Bowser-Morner Vice President and Chief Engineer of our Toledo office, on his selection as a Diplomat by the Academy of Geo-Professionals. This award is special indeed: Mr. Hoppenjans is one of the first geoprofessionals given this honor.

Of course, with Dick's impressive background in geotechnical engineering, we're not one bit surprised about this newest award. With a B.S. in Civil Engineering and a master's in Civil Engineering with an emphasis on Geotechnical Engineering, Dick Hoppenjans has served as President of Bowser-Morner Associates, Inc. since 1985 and is Chief Engineer in our Toledo office. Mr. Hoppenjans was Technical Director for Bowser-Morner from 1974 to 1985 and began working for Bowser-Morner as a geotechnical engineer in 1972.

In addition to his daily involvement in geotechnical engineering, Dick stays up to date on the local and national engineering scenes as a Fellow of the American Society of Civil Engineers, and a member of the National Society of Professional Engineers, the Ohio Society of Professional Engineer, and the Toledo Society of Professional Engineers. Dick also is a registered Professional Engineer in Ohio, Michigan, Indiana, Illinois, and New Jersey.

While this award is his latest, it is by no means Mr. Hoppenjans' first. Among other honors, he was chosen as Toledo Engineer of the Year in 1998 and as Civil Engineer of the Year in 1997.

The Academy of Geo-Professionals (AGP) was founded in 2008 to offer post-license credentials to help professional engineers gain further recognition in the geotechnical engineering field.

We can't think of a better person to be part of this special first year of honorees. Congratulations to Dick Hoppenjans from all of us at Bowser-Morner!

If you'd like to congratulate Dick on this award or talk with him about one of your projects, just give him a call at (419) 691-4800, ext. 228. You can also reach Dick by email at jhoppenjans@bowser-morner.com. You can be sure that no matter how many honors he receives, Dick is always glad to talk with our clients.



JEFF ARP: THIS GEOLOGIST ROCKS

When you work around geologists like all of us at Bowser-Morner, you learn a few things. Although you never want to help a geologist move because of all the heavy rocks you'll have to haul, with a geologist around, you'll never be reduced to wondering what kind of rock you picked up on your last vacation. Geologists never see a rock they can't identify in minute detail, including how it came to be where it is and how many years ago it was formed.

As our clients who work with our geologists, including **Jeff Arp, Senior Hydrogeologist in Bowser-Morner's Dayton office**, know, those qualities can be extremely useful. For clients who need help with solid-waste permitting or solid-waste groundwater studies, compliance issues, and other areas, the geology of a site means more than just the rocks on the ground.

As a Registered Professional Geologist who earned a B.S. in Geology from The Ohio State University and

completed graduate courses in contaminant hydrogeology, Jeff has the background these clients need. Jeff also studied Karst Hydrogeology at the Center for Cave and Karst Studies at Western Kentucky University.

In addition to his educational expertise, Jeff's experience is just as solid. His years of helping clients includes work as a project manager and senior hydrogeologist for solid-waste site permitting in Ohio, Indiana, and Michigan. Those projects include the initial design and permitting site investigations for landfill permitting. As you may expect, it's complicated work that consists of characterizing the hydrogeologic conditions, developing a detection monitoring system, identifying siting criteria and setback issues, and much more.

Jeff's dedication to the field of geology is clear as well in the company he keeps. A member of the Geologic Society of America, the National Groundwater Association, the National Speleological Society, and the Cave Research Foundation, Jeff stays up to



date with the field of geology and related areas with these organizations and his own outside interests.

If you have any questions about how we can help you with your "rockiest" projects, call Jeff at **(937) 236-8805, Ext. 258**. You can also email Jeff at **jarp@bowser-morner.com** or send him a fax at **(937) 233-2016**. And if you're wondering what kind of rock that is in your back yard, he can even answer that--in great detail.



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An Intern's Close-Up View of Bowser-Morner



Here at Bowser-Morner, serving our clients is our highest priority and our pleasure as well. We know that our clients depend on the work we do for them, and we want to do our best.


Just as we want to help our customers do well, our company and employees are dedicated to making a good difference in our communities as well. Since we ourselves are always expanding our knowledge to keep up with the newest research and innovations in our fields, we naturally are happy to help others with their educational pursuits as well.

That's why we were proud to host a local student, **Caitlin Robinson**, from Walter E. Stebbins High School, as an intern in our Dayton office. Caitlin spent her time observing **Tom Ryan, Manager of Operations, Analytical Services Division**, and our chemists as they worked on special projects and other analyses.

While we think that all of our work is interesting and we know that every project is important, in our day to day work with various technical and complex issues, we sometimes forget just how fascinating some of our work can be. Our chemists and scientists can indeed often "See a world in a grain of sand."

Thanks to Ms. Robinson and her thank-you letter to us, we remember once again just how interesting our work is. As Caitlin said, "I learned a great deal about what chemists do and about the different people that they work with. I also learned that chemists do more than mix chemicals and that there is a lot of analytical work involved."

Ms. Robinson's favorite parts of the work included the various Scanning Electron Microscope (SEM) photographs, as noted in her comment, "That part of my experience was a really fun thing to do, and it was really interesting also."

While all of us at Bowser-Morner very much appreciate Caitlin's kind words and thank-you letter to us, helping a student see the fascinating world of our analytical lab and seeing our world through the eyes of an intern was our pleasure, indeed. 

(Our Superhero XRF, continued)

by an appointed commission representing the member nations of the European Community. Restrictions have been placed on the maximum amounts of lead, cadmium, mercury, hexavalent chromium, and polybrominated flame retardant (plastics and elastomers only) in the components under consideration.

The RoHS Directive and similar directives in China, Japan, and California as well as the prospect of more like them have companies working hard to address the trace elemental contents of new electrical and electronic equipment being produced for the importation, sale, and use in those areas. As a result, testing to meet the directive is critically important to the manufacturers of exported electronic equipment and devices.

To help our clients accomplish this goal, the Analytical Services Division at Bowser-Morner adapted our existing testing programs to specifically address our clients' work and products to comply with the standards of the directive. Although the actual chemical compliance to the RoHS Directive can be established by several common laboratory methods, analysis by a procedure like our "superhero" XRF is widely considered the most effective, the most time-saving, and the most economical to perform.

While the analytical approach above is almost seamless for a pure material or a component in just one phase, challenges arise with multiple subcomponents. With those samples, general screening of a simple device with few subcomponents is performed, again using XRF. If no indication of the hazardous elements is detected, the sample may be considered compliant to the RoHS Directive.

For a device with multiple subcomponents, the components can be physically separated, and each component can be evaluated for the hazardous elements. A final overall analysis is compiled by the weight fraction of each subcomponent.

More complicated devices with varying types of subcomponents like wires, insulators, etc. often require chemical or physical homogenization. The blended samples are then evaluated for the hazardous chemical entities.

While all of the methods above are considered acceptable to the testing requirements of the RoHS Directive, the degree of expertise required increases with the use of each of the methods.

If you'd like to hear what our new XRF can do for you such as with your RoHS requirements and the present directives, just give us a call. You can reach Mike Liberty, Vice President of Analytical Services, at 937-236-8805, ext. 256, or Steve Kosztya, Regional Representative and Business Development in Cleveland, at 330-908-3112. We'll be glad to put our "superhero" XRF to work for your latest challenge.