ACE YOUR TEST

How to Get the Most Out of Construction Materials Testing

By the Rubber Nerds of ACE Laboratories

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These guidelines will help you prevent problems and increase profits

>> Introduction

Here's why we got into the industry.

ACE Laboratories got into the construction industry by asking one of our favorite questions: ***What if this could be better?***

The rubber industry is one of many **facing a specific challenge:** There aren't enough certified labs to handle all of the industry's testing needs, which leads to a dearth of responsive service. At ACE, we've always been motivated by our passion for excellent customer service, and we're proud to offer both **top-quality data and the best turnaround times in the industry**. We were looking for a way to branch out and provide that same level of unbeatable service to another market.

What happened next was a **stroke of luck:** Less than 30 miles away, a construction products testing laboratory was about to close its doors.

There are a number of overlaps between materials testing and construction testing, making **construction a natural complement to our core business.** And their team of laboratory technologists had years of experience in the construction industry and a reputation for excellence.

Finding a **knowledgeable, ready-made team** that aligned with our core values was a once-in-a-lifetime find. We couldn't pass up the opportunity.

The two teams merged seamlessly, **complementing each other's knowledge and experience,** blending tried-and-true customer service philosophies, and expanding our capabilities practically overnight.

Now, ACE is proud to offer **exceptional, reliable testing and validation services** for construction materials, along with the **fastest turnaround times** in the industry. We wrote this book because we want to help our clients get the most value from their testing programs. After all, testing is an investment, and we want you to **get a good return** on your dollars. If you want to optimize the testing process and bolster your business, read on.

Best,
Erick Sharp, CEO

>>Why You Should Never Skip Testing: A Case Study.

Premier Materials has been producing reliable joint and crack sealants for nearly fifty years. But when the COVID-19 pandemic rocked supply chains around the world, Premier couldn't procure the raw materials they had relied on for decades. Faced with the prospect of having to halt production unless they were willing to pivot, they decided to go with an alternative, a material they had never worked with before.

Seemed Like a Good Break

Around the same time, the regional regulatory body announced a temporary waiving of certain compliance tests. Construction materials manufacturers were allowed to forego a few elements of the typical verification testing protocol in order to get their products to market faster. Already struggling to keep up with demand, Premier took advantage of this new flexibility and released their new sealant compound after completing only the necessary validation testing, rather than the full protocol.

Then Something Went Wrong

Less than a year later, Premier got a call from an unhappy customer, who complained that Premier's joint sealant—made with the alternative raw material—was already cracked. Premier's website and the sealant's packaging both promise at least five years of performance, so a report of product failure after less than 12 months was unsettling.

Maybe It Was a Fluke (Cross Your Fingers)

Premier hoped the call was an isolated incident, but unfortunately, it was the first of dozens. Complaints about the joint sealant rolled in for months, forcing Premier to pull the product and compensate all those customers. Still unable to procure their preferred raw materials, they sent the new compound to a testing lab for a full suite of tests.

Problem Solved (The Hard Way)

One of the validation tests that had been waived by the regional regulatory body revealed the issue—and a fairly simple solution—right away. Premier was able to rework the compound and re-release the product, along with laboratory data demonstrating that the issue had been fixed. A few customers were happy to purchase the updated joint sealant, but others remained suspicious. They refused to buy the new product until someone else had used it for at least a year with no issues.

The Tough Climb Back

Sales of the joint sealant were depressed for months. Nearly two years after the first complaint call, Premier was able to put together a real-world performance report with pictures and testimonials from loyal customers who took a chance on the reconfigured compound. The report managed to reinvigorate demand for the joint sealant, and sales numbers finally began to climb. But the losses of the past two years—not to mention the time that could've been spent developing new products—would never be recovered.

Lesson Learned

Unfortunately, Premier's story is not unusual. Many companies find themselves battling product failures—and major hits to their reputation—that could have been prevented. Investing in laboratory testing allows manufacturers to detect potential issues right away and find a solution before investing thousands of dollars into industrial-scale production and product launches.

What Can Go *Right* With Testing? See Next Page.

>> The Benefits of Laboratory Testing

Many people make the mistake of categorizing laboratory testing as a check box exercise, or "just another thing" that must get done before product launch. And while testing does appear on plenty of checklists, refusing to see it as anything else is a missed opportunity.

Laboratory testing can reveal your competition's secret ingredient or the unlikely source of a challenging issue. It can fill the gap between passable and exceptional performance. Laboratory data can light the path toward a better product.

> ***"Laboratory data can light the path toward a better product."***

The benefits of laboratory testing are virtually endless, so we'll start with the basics: Compliance.

Compliance and safety.

One of the most common—and most important—reasons to invest in laboratory testing is compliance. Industry standards are usually developed with the goal of demonstrating safety and performance and keeping low-quality products from saturating the market.

Compliance with these standards is vital to remaining competitive: There are countless organizations, including governments, regulatory bodies, and OEMs, that will only use materials and products that comply with industry standards. Even if you're not legally obligated to invest in laboratory testing, choosing to skip testing can limit the number of customers who are willing to work with you.

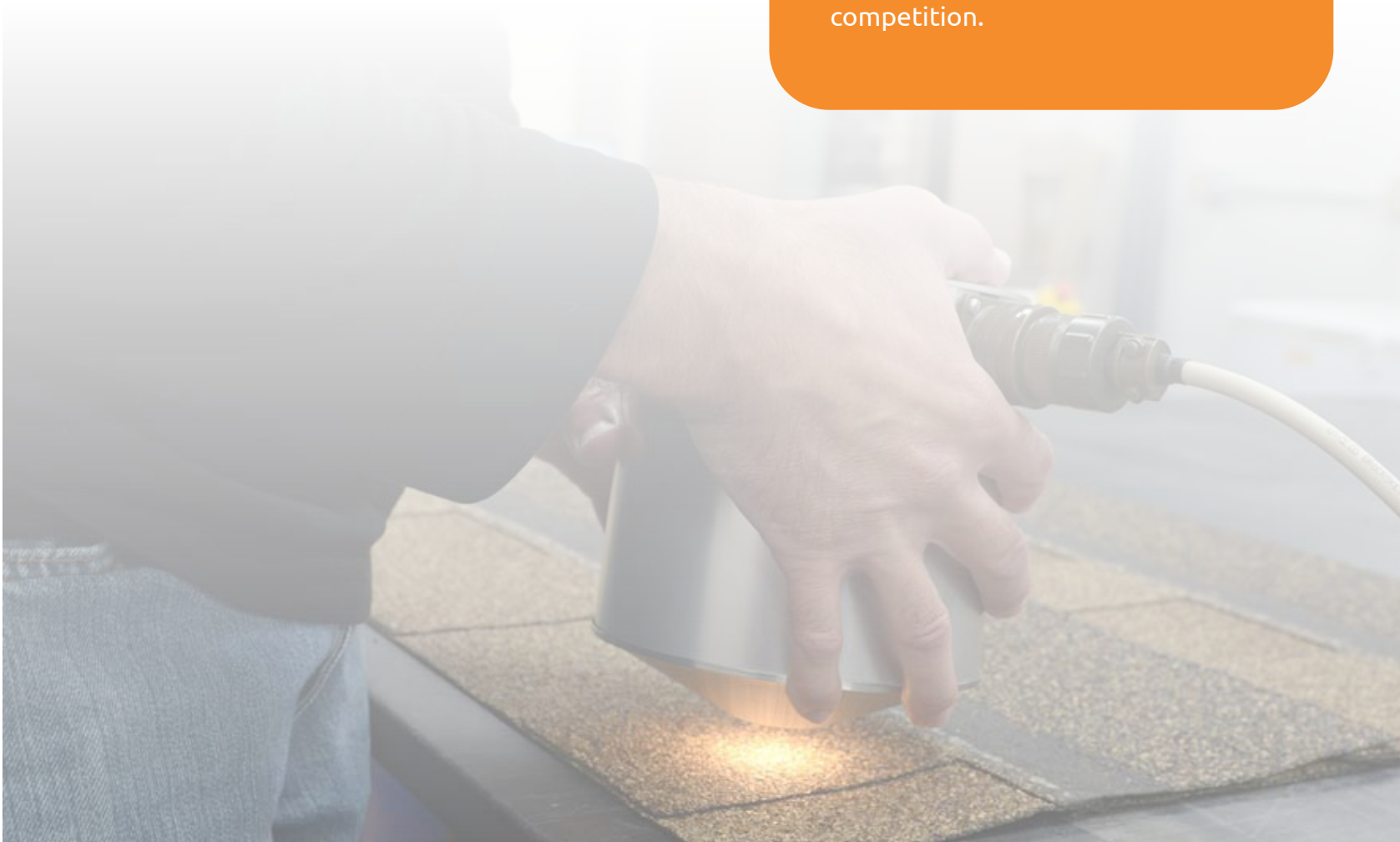
Protect Your Reputation.

Industry standards are developed based on available data. But these standards don't always evolve as quickly as the industry changes, which can lead to gaps in the testing methodology. In other words, some potential issues may not be detected by a prescribed set of standard tests. If this leads to failures in the field, it'll be the reputation of your company, not the governing body, that suffers.

If you're concerned about testing gaps or you want to evaluate a risk or performance attribute that's not covered by standard testing, laboratory testing is a fantastic option. Experienced lab technicians, chemists, and engineers can design custom protocols that address your areas of concern or curiosity. As a result, you can reduce the risk of product failure, find new ways to improve your products, and protect your business's reputation.

Stand Out From The Competition.

Laboratory testing isn't just for assessing your own products. You can also use testing data to investigate competitor products. Excellent testing labs can conduct reverse engineering and benchmarking studies to help you understand what your competitors are doing and how your products compare to theirs. You can use that data to make improvements or make confident claims about what truly differentiates you from the competition.



>>How To Get The Most Out of Your **Testing Program:** 4 Questions to Ask Before You Get Started

Laboratory testing is a serious investment, one that should not be made lightly. There are a hundred ways to approach any testing program, and the right approach relies on you knowing a few key things about what you're hoping to discover or achieve.

Here are four questions to ask yourself before you get started. Thinking through these key ideas in the early stages will help you plot your next steps and enable your laboratory testing partner to design a program that will answer your questions, meet your needs, and keep you moving forward.

1. What are you hoping to accomplish?

Testing can range from a simple check box exercise to a highly customized, months-long investigative process. And there are **many reasons for undergoing laboratory testing:** compliance, research and development (R&D), competitive benchmarking, failure analysis, and more. The reason *why* you're investing in laboratory testing can have a big impact on where your program lands on that spectrum.

If you just need to demonstrate compliance with an industry standard or OEM specification, there's no need to pay for anything beyond what's required. You just need the lab to execute the prescribed test method.

But if you're investigating the root cause of a mysterious problem, working from a checklist is unlikely to get you the answers you want. You'll need a customized protocol, developed based on the specifics of the issue, and **executed by experienced professionals who understand the art of studying data for answers.**

Take a moment to reflect on your goals before you get started, and be sure to share them with your independent laboratory testing partner. They may be able to recommend changes to your approach so you can optimize your investment and forego any unnecessary steps.

2. What differentiates you from your competition?

In virtually every industry, brands invest considerable capital into distinguishing themselves from their competitors. Without differentiation, consumers would have no reason to believe that Nike, Adidas, or Reebok could offer them something unique. **It's vital to understand what makes you stand out from your competitors,** what makes your customers loyal to you.

If you're not sure how to answer this question, **ask your customers.** Why do they come back to you over and over? What do you offer them that they can't get anywhere else?

You can look to the future when answering this question, too. How do you aspire to stand out from the competition? The answers may determine what you're looking for when you review your testing data.

3. What's your timeline?

Do you need your data as soon as possible? Or can you wait a while?

Some laboratories simply can't deliver on a tight deadline, while others design all their processes around lightning-last turnaround times. When you're ready to invest in testing, **you need to be crystal clear on your timeline,** so you can pick a testing lab that will help you stick to it.

4. What's happening in your industry?

Every industry is prone to change and evolution over time. But some are in the midst of dramatic shifts. The construction industry, especially, is evolving in response to growing demand for sustainability and a spike in infrastructure activity prompted by the U.S. Bipartisan Infrastructure Law.

It's important to know your stance on industry trends and changes when you begin the testing process. For example, roofing material manufacturers must decide whether they want to offer products that **meet the standards of the Cool Roofs Rating Council (CRRC)** or stick with traditional materials.

Pay attention to what's happening around you and what your competitors are doing. You can plan a testing program around whether or not you want to partake in current trends.

>>What Sets ACE Apart:
Our Approach and Capabilities

At ACE, we've designed all of our procedures and operations around agility, so we can offer the fastest turnaround times in the industry. We're not just going to deliver the **best data;** we're going to get it to you as **quickly as possible,** even if that means turning on a dime. Our testing experts are **fast and flexible thinkers** who are always looking for ways to make the process more efficient, so you can stick to your product deadlines and stop worrying about needless delays.

We're pros at both industry standard test procedures and custom protocols. You can count on us to help you determine the right set of tests based on your unique circumstances, so you can get the answers you need without paying for irrelevant data. We've also invested heavily in **state-of-the-art testing instrumentation and equipment** to ensure that our data is always above reproach.

In addition to testing, ACE also offers advanced technical consulting to support **your most challenging questions** related to design, formulation, processing, failure analysis, and more. Our team has years of experience in both laboratory settings and fast-paced industry environments, which means **we understand the pressures and limitations** you're facing.

Testing Capabilities

Solar Reflectance Testing

- **ASTM C1371**—Standard Test Method For Determination Of Emittance Of Materials Near Room Temperature Using Portable Emissometers
- **ASTM C1549**—Solar Reflectance Near Ambient Temperature Using A Portable Solar Reflectometer
- **ASTM E1980**—Standard Practice For Calculating Solar Reflectance Index Of Horizontal And Low Sloped Opaque Surfaces

Testing for Roofing Coatings

- **ASTM D6083**—Specifications For Liquid Applied Acrylic Coating Used In Roofing
- **ASTM D6694**—Specifications For Liquid Applied Silicon Coating Used In Roofing

Other CRRC Test Methods

- **ASTM D1005**—Standard Test Method for Measurement of Dry-Film Thickness of Organic Coatings Using Micrometers
- **ASTM D751**—Standard Test Methods for Coated Fabrics
- **ASTM D7897**—Standard Practice for Laboratory Soiling and Weathering of Roofing Materials to Simulate Effects of Natural Exposure on Solar Reflectance and Thermal Emittance
- **ASTM E805**—Standard Practice for Identification of Instrumental Methods of Color or Color-Difference Measurement of Materials
- **CRRC Rapid Ratings**
- **CRRC Tile Template Method**
- **CRRC-1 TM#1**
- **Section 9**

Bituminous Material Testing

- **ASTM D36**—Standard Test Method For Softening Point Of Bitumen (Ring-And-Ball Apparatus)
- **ASTM D4402**—Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
- **ASTM D5329**—Standard Test Methods for Sealants and Fillers, Hot-Applied, for Joints and Cracks in Asphalt Pavements and Portland Cement Concrete Pavements
- **ASTM D5**—Standard Method For Penetration Of Bituminous Materials
- **ASTM D6084**—Elastic Recovery Testing of Bituminous Materials
- **ASTM D6297**—Standard Specification For Asphaltic Plug Joints For Bridges
- **ASTM D6690**—Standard Specification For Joint And Crack Sealants, Hot Applied, For Concrete And Asphalt Pavements

Physical & Analytical Testing for Materials

In addition to our construction testing capabilities, ACE is outfitted to provide comprehensive testing services for a wide range of polymer and elastomer materials. We can evaluate the physical performance properties of materials by subjecting samples to rigorous laboratory tests, or we can break materials down to an elemental level in search of detailed composition data.

Physical Testing Capabilities				
Abrasion	Dynamic mechanical analysis (DMA)	Flex fatigue	Ozone exposure	Tear resistance
Adhesion	Electrical	Flexible cellular materials	Rebound resilience	Tension
Compression	Environmental conditioning	Fluid aging	Sample preparation	Weathering
Durometer hardness	Flammability	Heat aging	Specific gravity	

Analytical Testing Capabilities		
Chromatography	Moisture analysis	Titration
Differential scanning calorimetry (DSC)	Scanning electron microscopy (SEM)	Wet chemistry
FTIR	Thermal conductivity	X-ray fluorescence (XRF)
ICP-EOS	Thermogravimetric analysis (TGA)	

>>Who Are The Rubber Nerds?
The ACE Story

The rubber industry has a long history of being formal, immutable, and maybe a little stiff. Trade shows and industry events were a sea of **suits, firm handshakes, and old-school sales tactics**, and there was very little room for humor or clever messaging.

For decades, this approach worked just fine. But in recent years, a problem has emerged: The industry can't attract younger talent. The average age of a rubber professional is 61, and the industry's top minds have already begun to retire. Which begs the question: **Who will take their place?**

We knew something needed to change, so we challenged ourselves to think differently. How could **we bring levity and fun to the industry** without cheapening its intellectual power?

We found inspiration from an unlikely source, well outside the rubber industry: Best Buy. The consumer electronics giant's iconic Geek Squad was among the first public campaigns to **reclaim the concept of "geekiness" or "nerdiness"** by transforming it into a marketable asset. Once the Geek Squad came to town, a "Geek" became someone we *needed*.

So we asked ourselves, could we apply the same principle to the rubber industry?

After all, a "nerd" is more than just a smart person. A nerd is someone with **true enthusiasm** for their area of expertise. Trekkies are Trekkies because they dominate at SciFi Trivia Night—and because they *love* Star Trek.

And we're not just rubber experts. We love it! **We really, truly enjoy our work.** We are fascinated by rubber and other materials, and we're genuinely excited to help our clients make their rubber products better.

If that makes us rubber nerds, then we'll wear the label proudly.

And it seems that the rubber industry was ready for someone to shake up its formal traditions: Embracing the fun of society's newfound love for nerds has **landed us more business than we ever thought possible.** It's also made it a lot easier to attract young talent. We've become the go-to lab for younger chemists entering the industry, and all that fresh insight—and energy!—is already **yielding great results for our clients.**

The rubber industry is poised for a massive transition, probably in the next five years. We will be on the leading edge of it. We hope to see you there.

Sincerely,

The Rubber Nerds

ACE LABORATORIES

Connect with ACE to find out how we can help you test, develop or refine your rubber, polymer or silicone products.

Ace-Laboratories.com