

Is It Just Me, or Does Every Building Leak?

By David Leslie, RWC

It was August, and I had just finished presenting “Design, Material, and Installation: The Three Facets for an Integrated Weather Barrier” to the Austin, Texas, chapter of the Building Enclosure Council (BEC). As my presentation implied, my goal has always been to positively change our industry and to give insight into why buildings leak. Anyone who knows me or has seen me present knows that I am very passionate about the building envelope industry and believe to my core that there is no good reason why a building should leak. The audience’s reaction was overwhelmingly positive, and there was an enthusiastic understanding, which is usually the case. However, something different happened after that presentation, and it became the impetus for this article. I was asked a very poignant question: “How do we change the industry?”

Buildings that have environmental intrusions (air, thermal, and water leaks) are the number-one cause for unusable occupied space for building owners. In my research, I discov-

ered that roughly 90% of litigation with architects involves leaks in a building. Additionally, the number-one problem for general contractors in closing out a building involves building leaks and is the primary reason for specialty subcontractors being called back. Consequently, the greatest source of liability for building weather barrier system manufacturers is, again, leaks in the building. Buildings that leak are a

big problem, and that problem is growing as technological advances increase the complexity of designing and constructing buildings. The fact that the issue continues to grow is the reason that organizations like the American Institute of Architects (AIA) have started the BEC, the reason that RCI has developed a Registered Building Envelope Consultant® (RBEC®) registration, and the reason continuous air and weather

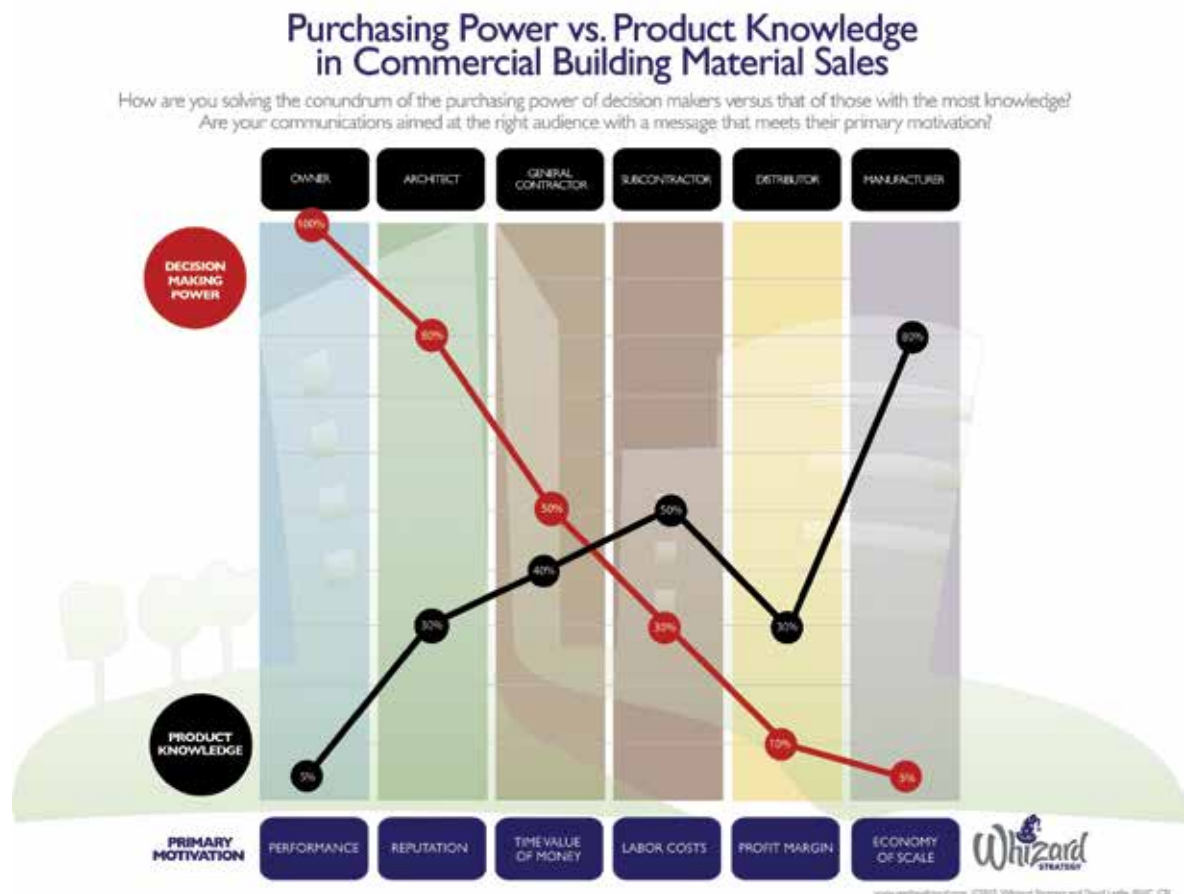


Figure 1 – Power purchasing vs. building material product knowledge.

barrier and other ASTM building envelope standards are being written into all of the building codes. The need for these new designations is a clear indication that many people are asking that same question: "How do we change the industry?"

The person who asked that pivotal question at the Austin BEC was John Posenecker of Chamberlin Roofing & Waterproofing of Austin. We have been friends for years and frequently discuss how to improve our industry. But his query hit close to home for me because it begs the question: What good is a consultant if he tells you what the problem is but doesn't tell you how to fix it? In the presentation, I defined five primary objectives that establish a process of creating integrated weather barriers (i.e., buildings that don't leak); however, these processes don't have the breadth or width to impact the industry as a whole because they are simply tasks.

In order to change the industry, there has to be a universal vision and relevant and consistent message to effectively communicate the vision that leak-free buildings are attainable, and it has to be relevant to the stakeholders involved in constructing buildings. What is most interesting is that the very thing needed to focus the vision—and therefore define the message—is actually in the presentation itself and is captured in the Purchasing Power vs. Product Knowledge graphic (*Figure 1*). This simple graphic is a powerful tool that creates insights into the dynamic workings of our industry's purchasing chain and into the mechanisms of how buildings are constructed.

I have 25 years in the roofing and waterproofing industry and have been blessed with a wide array of life experiences, but in college, I actually majored in baseball. Being an athlete teaches many fantastic things, but a lesson that has served me well beyond sports is that having good fundamentals is the key to reaching maximum performance, and understanding those fundamentals is critical to knowing how to improve. Before we can develop a vision and, ultimately, the message to change the industry, we must first agree upon the fundamentals for constructing buildings that perform as intended. Following are the universal fundamentals that I believe are key to achieving those results:

- Amazingly enough, it is frequently overlooked that the primary reason for constructing a building is to

provide shelter for human activity. When this concept is forgotten, grave mistakes are often made during construction related to the building's weather barrier systems. **The building's primary purpose is to keep the outside environment out and the inside environment in.**

- Because the building's primary purpose is to serve as shelter, it has to be viewed as a whole and not just a sum of its parts. The reality is that 90% of all environmental intrusion occurs in less than 1% of the building surface.¹ That 1% area includes the terminations, penetrations, and transitions for the weather barrier systems. This basically means that leaks occur where one weather barrier system stops and another one begins. **For any building to perform as intended and to be leak-free, all of the weather barrier systems have to function together to create an integrated weather barrier.**
- Creating an integrated weather barrier does not happen by chance—it must be planned. Regardless of what is being constructed, there are three facets to the process:
 - 1) Design (the prescribed plans for moving an idea from vision to tangible)
 - 2) Material (the physical products chosen to move the vision from intangible to reality)
 - 3) Installation (the process of assembling the materials to bring the vision to fruition).

These components are intimately intertwined, inseparable, and interdependent. A flaw with any one of them can result in poor performance, and a flaw in all three will cause significant failure. **Design, material, and installation create a prism, and through this lens, we can project an image of how to construct buildings that are leak-free and view ways to correct existing buildings that are not.**

The question then becomes, if we know these fundamentals, why do buildings leak, and how do the fundamentals relate to the information in *Figure 1*? To better understand how the graphic functions and relates



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Figure 2 – The purchasing chain.

to the three fundamentals, it is helpful to know why the graphic was developed. Some years ago, while working as the technical services manager for a building weather barrier material manufacturer, I was performing a training class for some newly hired employees. During the class, I posed the question, “Who is our customer?” Someone in the class responded, “The contractor.” My reply was, “That answer is the very reason that our industry has a poor reputation and why buildings leak.” Ultimately, the customer for everyone involved in constructing buildings is the building owner. To illustrate the concept, I wrote on the white board what I called the “Purchasing Chain” (Figure 2).

Regardless of where you fall in the chain, it is easy to forget that the person everyone is working for is the building owner, who sits at the top of the chain. This is an especially difficult reality for groups to the right of the general contractor, because they virtually never have direct dealings with the owner. I then expanded the concept

by plotting the points for the Purchasing Power vs. Product Knowledge graph (Figure 1) and the stark realization that the person with the most power has the least knowledge, and the person with the most knowledge has the least power (Figure 3).

What is even more telling, however, is that the purchasing chain also reflects the sequence for actually constructing the building; and conclusively, this is where the three fundamentals become relevant. The general chronological process of actual construction is:

- Owner hires an architect to design a building.
- The architect’s design documents are issued for bid from general contractors.
- The general contractor then selects specialty contractors who purchase the weather barrier manufacturer’s products from a distributor.

When this sequence is viewed in relationship to the Purchasing Power vs. Product Knowledge graphic (Figure 1), we realize that the reverse relationship with power and knowledge carries throughout the entire graphic. Because design, material, and installation are intertwined, inseparable, and interdependent for constructing leak-free buildings, the fact that an architect is designing a building with only 30% product knowledge creates significant opportunity for flaws in the weather barrier systems for the entire duration of the product.

This is not to say that all issues belong to the architect. Nothing could be further

from the truth because there is no possible way for the architect to know all the available weather barrier products for the building envelope, and the architect is not actually installing the products. Due to this reality, many of the critical details of the termination, penetrations, and transitions (where 90% of all leaks occur) are deferred to the general contractor via shop drawings from the specialty subcontractor and during actual construction. There was an era when this process was practical because the general contractor had many of the specialty subcontractors in-house, and everyone involved understood that they were constructing the building as a whole. With the purpose of optimizing production by everyone becoming a specialist, the current business model is for the general contractor to function as a project administrator and utilize specialty subcontractors who have a very narrow focus of a single discipline, such as roofing. Unfortunately, specialization—the very thing that has helped us advance as a society—has become a hindrance to constructing buildings that don’t leak. Few people know how to install terminations, penetrations, and transitions properly; fewer manufacturers make all of the products for them so that they are compatible; even fewer people know how to design them so they don’t leak; and virtually no one takes responsibility for them. Because of this fact, the vast majority of the time, the final decisions for how the building is constructed fall on the shoulders of the general contractor, who has 50% of the purchase power and 40% of the product knowledge (Figure 4).

Ultimately, due to the process of constructing buildings, often the primary reason we are building it in the first place gets lost, and we wonder why virtually all buildings leak.

Mark Mitchell, author of *Building Material Channel Marketing* and owner of Whizard Strategy (www.seethewhizard.com), used Figure 1 as the centerpiece for a chapter in his book to illustrate how the Purchase Power vs. Product Knowledge concept can help marketing be more effective. However, the same core principle found in the primary motivation of the graphic that makes product placement messaging effective is also applicable to that message for positively changing our industry (Figure 5).

For true change to be accepted and sustainable, it has to be beneficial to all of the stakeholders; but even more important,

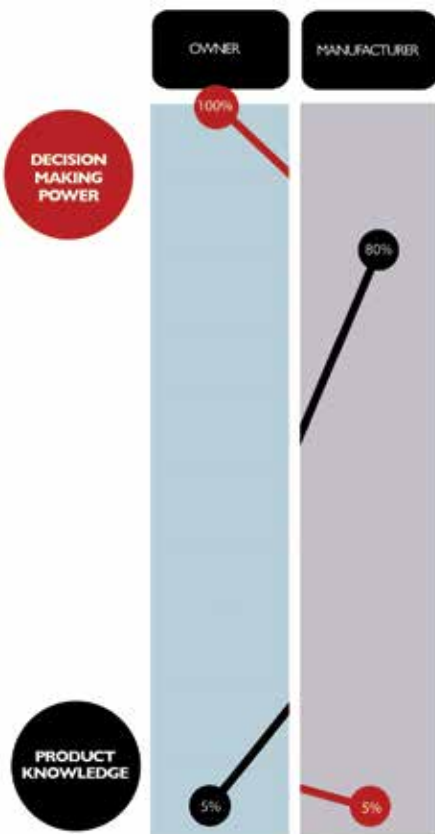


Figure 3 – The decision-maker power vs. product knowledge.

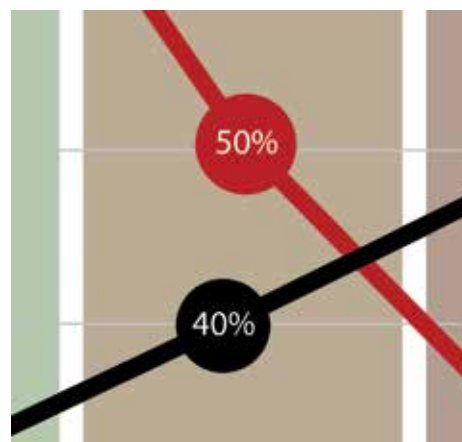


Figure 4 – The general contractor.

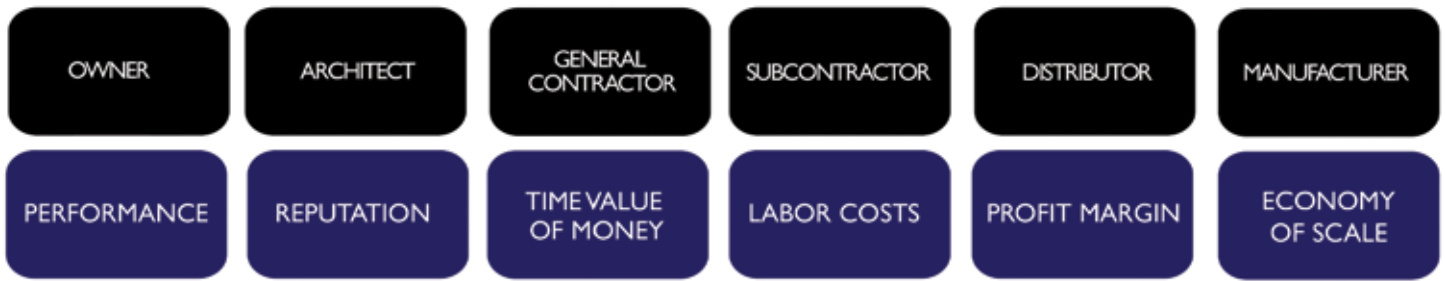



Figure 5 – Project stakeholders and their primary motivation.

it has to be practical for everyone. An integrated weather barrier producing a leak-free building obviously would be beneficial for everyone, but if the process does not provide value for any one stakeholder, it will not be followed. Regardless of who you are, value is only created by a combination of three things: wants, needs, and budget. When I say there is no good reason for buildings to leak, I mean exactly that: no good reason. The designs, materials, and installation processes all currently exist to produce an integrated weather barrier and would not require any additional cost. Sadly, as I stated before, the current process of constructing is not conducive to making buildings that don't leak.

Unfortunately, the wholesale process of constructing buildings that don't leak does not exist, and I don't know exactly what it is going to look like, but it will require a paradigm shift with all of the stakeholders participating. However, in the meantime, the industry is not doomed to producing

leaky buildings. The workaround is to have a dedicated person working outside of the current process, functioning as the integrator from the very inception of the building until fruition.

How do we change the industry? Honestly, we just have to remember that we construct buildings to keep the outside out and the inside in. Just as there needs to be a vision to bring the weather barrier components to work as a single unit, so there needs to be a vision to unify the stakeholders to construct the building as a whole. 

FOOTNOTE

1. Michael T. Kubal, *Construction Waterproofing Handbook*, Second Edition, 2008 (New York: McGraw-Hill), p. 1.12.

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