



Powered by  
***schrofftech***

TruField® White Paper

# TruField®: A Game-Changer for Top-of-the-Pole Small Cell Concealment



## Author:

Christophe Massenet, Vice President of Technology & Engineering



## Introducing TruField® Technology



Designed especially for 4G/5G networks, RF Industries has developed TruField™, a first of its kind, patent protected, tensioned fabric concealment solution. Traditional small cells face many challenges such as signal degradation and coverage reduction due to the composite that the concealment solutions are made of. **TruField offers true RF signal transparency.** It has been tested by independent labs and wireless carriers to have far superior RF transparency qualities as compared to traditional concealment shrouds in the market today that degrade network performance. TruField utilizes a proprietary outer shell material developed by Saint-Gobain, our exclusive strategic partner, resulting in **clean RF transmission with superior signal strength and overall RF coverage.** TruField is band agnostic and enables **multi-operator and neutral host business models.**

## Support multiple operators using different equipment and network technologies without degrading performance

Because the TruField concealment shrouds are designed to support multiple tenants with no signal degradation, neutral hosts can easily add equipment from multiple wireless carriers, IoT companies or public entities to each site to generate additional revenue. Its frequency-agnostic material allows all radio signals to pass through with no or negligible attenuation – which makes it suitable to host any technology, including mmWave radios which cannot tolerate standard concealment solutions. TruField leverages proven technology that has been used in microwave deployments for decades.

TruField can flexibly support diverse radio combinations and is ideally suited to support neutral host deployments. The solution is tailored to accommodate the equipment inside the shroud and is ready for future extensions and/or upgrades over time maximizing the return on investment (ROI).

The shroud unzips easily to provide 360° access to the interior, making it fast and cost-efficient to add and upgrade equipment and provide periodic radio equipment maintenance.

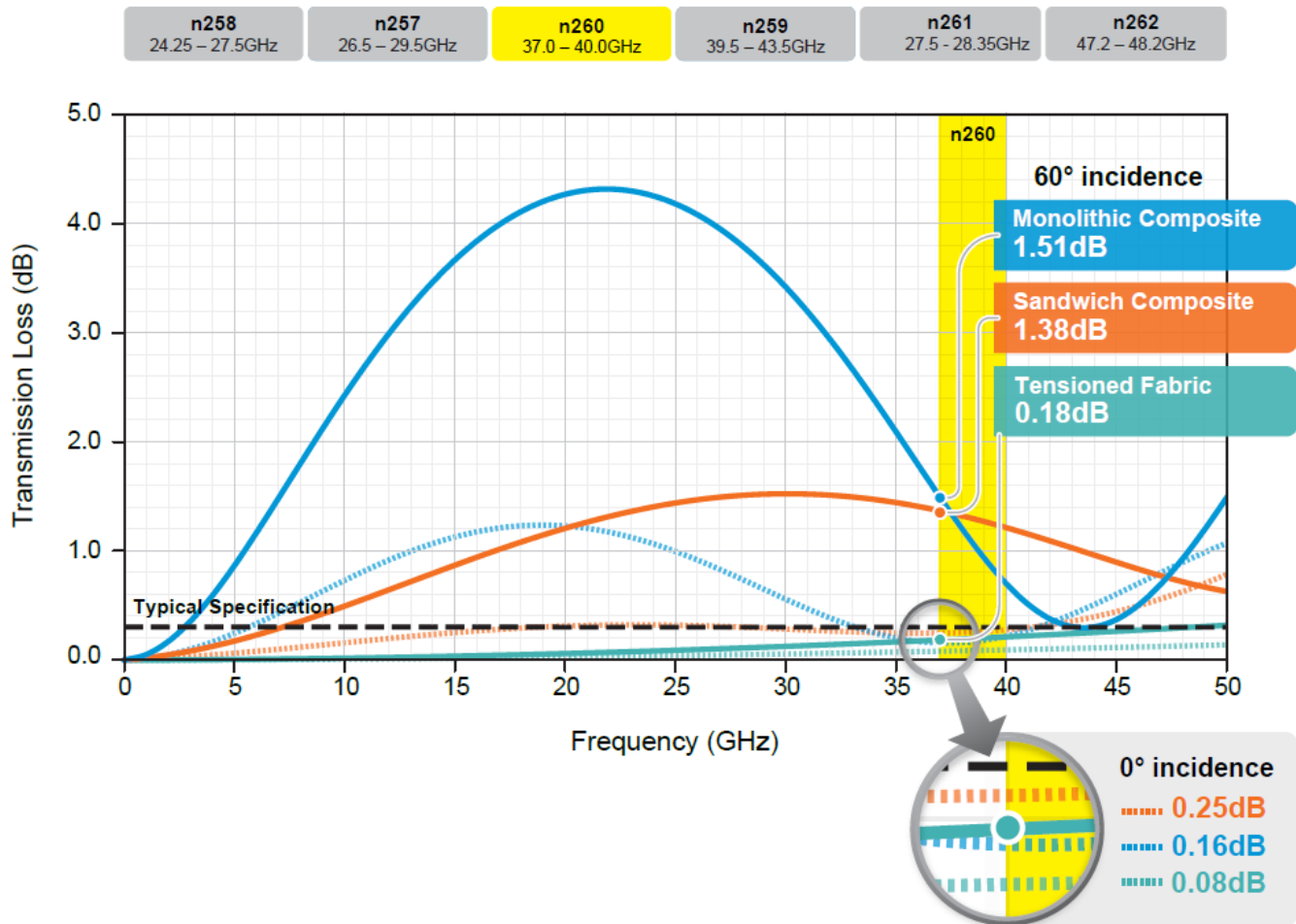
For maximum flexibility, TruField concealment shrouds are available in a range of sizes to support different equipment types and tenants in a single shroud. Any TruField concealment solution can be configured to fit any small cell or current mmWave radio on the market.



## True RF transparency enables exceptional small cell performance

TruField's extremely thin tensioned fabric enables true RF transparency as opposed to other solutions that use thicker plastic composite materials. The unique and lightweight outer shell material delivers less than 0.2 dB loss at any angle of incidence up to 60°, whether low-band, mid-band (C-Band) or mmWave frequencies are used.

As shown in the chart on the next page, RF tests have been conducted to evaluate losses from 1GHz all the way up to millimeter wave band at 27 to 40GHz. Tests were conducted to measure transmission losses with the transmit antenna at various distances (1 to 7 inches) from the fabric and at 0-, 30- and 60-degree angles. The results show that RF losses from 1 to 6GHz are almost nonexistent and less than 0.2dB at mmWave frequencies.



## Protect small cell equipment in any environment

The TruField shroud is highly durable, provides extreme UV resistance and is hydrophobic to naturally repel water, mold and mildew, and virtually eliminate the need for maintenance. This means lower overall costs.

A structural and material analysis was performed by a professional engineering firm to confirm the structural integrity of the shroud even when it was subjected to high winds atop a typical pole. This study covers the shroud structure including all internal bracketry, assembly parts and materials.

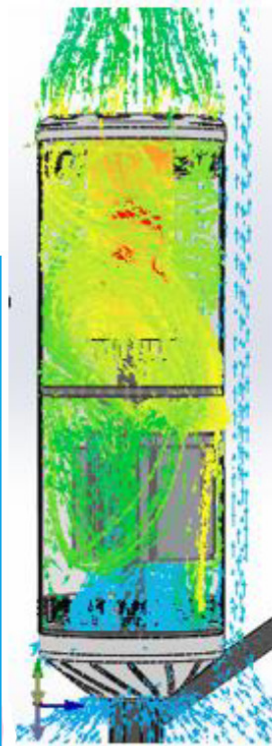
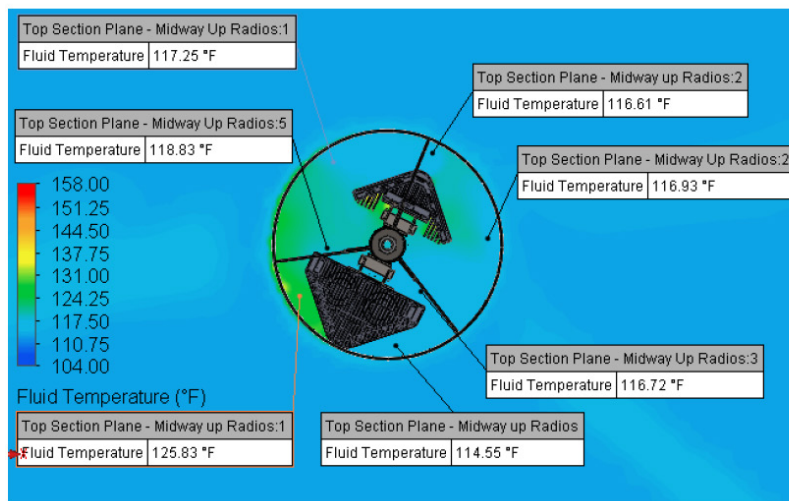
When subjected to wind speeds of up to 120mph at the top of a 50 foot pole with a total shroud weight of 180lbs (fully integrated shroud with equipment), the unit passed the NESC, TIA and AISC Design specifications with a maximum utilization rate of 67% for the most stressed item.

The shroud's outer fabric material has been tested according to ANSI/FM 4473. Extreme impact resistance through a hail cannon test where 1-1/4" diameter ice balls were projected at 65mph perpendicularly to the fabric material (worst case) resulted in no visible cracking or breakage. The fabric weave and internal structure was subsequently analyzed and did not reveal any damage to the fabric's internal integrity.



## TruField can take the heat

TruField is designed to enclose heat dissipating components whose performances are only specified up to a point. Thermal simulations have been conducted with configurations representing worst case scenarios (OEM mmWave radios along with a canister antenna with a top protecting cover). These simulations proved that fans would be necessary in extreme cases but also demonstrated that a simple redundant variable speed fan system could be implemented that will keep all equipment well within their specified temperature range. RF Industries' proprietary, controlled air-flow system enables optimal equipment operation at all times.



All materials used in the construction of the TruField™ shroud are either not flammable or flame retardant. The core shroud structure is made of aluminum, either extruded, bent or machined and assembled with steel fasteners. All non-metallic parts are either UL94V0 rated or NFPA 701 with instantaneous flameout. This includes the shroud top and bottom plastic caps, the shroud fabric sock and the internal wiring and electronic parts in addition to fans when used. All non-aluminum metallic parts are either bronze, stainless steel or zinc coated steel to prevent corrosion.

## Out of sight

5G brings tremendous potential to connect the world around us — from smart lighting, parking and utility metering solutions to connected cars, electric vehicle charging stations and CCTV security cameras. But providing the targeted small cell coverage needed to support these applications isn't easy. Urban areas are already crowded with telecom equipment, and aesthetics regulations for small cells limit deployment options. TruField conceals small cell equipment



Powered by  
***schrofftech***

# TruField® White Paper

---

at any height, on any pole, new or existing, meeting the aesthetic requirements needed for highly-visible small cell poles in metropolitan urban areas, densely populated communities and large capacity venues. A variety of color options helps these shrouds blend-in to any environment. With their lightweight, modular construction and mounting flexibility, TruField concealment shrouds are easy to install on any pole top.

## Conclusion

TruField is a major leap forward in the evolution of small cell concealment. It not only simplifies multi-operator/neutral host small cell deployments from an operational standpoint but enables seamless deployment of any technology without any frequency band limitations whilst securing the highest performance possible.

Its high flexibility and customization options open the door to unlimited street coverage applications – small cells, FWA radios and many more to come. This multi-tenant, RF transparent solution offers safety, ease of serviceability and low total cost of ownership. And, thanks to its band agnostic properties, TruField is truly a future-proof solution for multi-operator and neutral host small cell deployments.

## Additional Source Materials

1. TruField Video (RFI Home Page):  
<https://rfindustries.com>
2. Case Study:  
<https://rfindustries.com/wp-content/uploads/2023/03/rfi-case-study-munisite-trufield-march-2023.pdf>
3. TruField Landing Page:  
<https://rfindustries.com/trufield>
4. White Paper:  
<https://rfi-schroff.s3.us-east-2.amazonaws.com/TruField/Saint-Gobain-5G-Radomes-WP.pdf>



---

## ABOUT RF INDUSTRIES

RF Industries (RFI) provides a portfolio of small cell concealment products and integrated solutions to facilitate the rapid deployment of 4G and 5G infrastructure along with the flexibility and creativity to meet the most challenging small cell deployments.

Our high-touch customer approach allows us to be responsive, accessible and hands-on when needed, every step of the way. Unlike large organizations, you will always be our number one priority. Our end-to-end support promises personal attention, guidance, and partnership all the way through site deployment.

RFI's unique flexibility also gives us a competitive advantage. As an agile business, we are able to identify and react to challenges quickly and easily, resulting in a smoother overall customer experience