

Mission Darkness™ TitanRF™ Materials: Installation & Care Guide

Mission Darkness™ TitanRF™ Materials

Installation, Handling, and Care Guide

For Law Enforcement • Military • Government Contractors • Executive Protection

Contact: sales@aussecurityproducts.com.au

Welcome to Your TitanRF™ Guide

This guide provides consolidated information for projects using Mission Darkness™ TitanRF™ Faraday Tape and associated materials. We aim to clarify installation, handling, and care to ensure optimal RF shielding performance.

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Core Purpose & Technology

Mission Darkness™ products, by MOS Equipment™, offer advanced RF shielding solutions for law enforcement, military, executive travel, EMF reduction, EMP protection, and antisurveillance. TitanRF™ materials are designed to keep wireless devices offline by blocking a wide spectrum of signals.

Key Signals Blocked:

- Wi-Fi (2.4GHz & 5GHz)
- Bluetooth
- Cellular Signals (including 5G networks)
- GPS
- RFID
- Radio Signals (Low MHz up to 40 GHz)

Certified Performance

TitanRF™ Faraday Fabric and Tape undergo rigorous lab testing to meet industry standards:

IEEE 299-2006

Shielding Effectiveness for Fabric & Tape

MIL-STD 188-125

EMP Protection for Fabric

This ensures dependable RF shielding when correctly installed and maintained.

Understanding Your Materials

TitanRF™ Faraday Tape

This high-shielding conductive adhesive tape is vital for constructing DIY Faraday cages, seaming fabric, EMI shielding, and repairs. Its conductive adhesive ensures continuous shielding across sealed seams.

Key Specifications:

Feature	Detail
Widths	1", 2", 2.5", 6", 10"
Lengths	10ft, 164ft
Adhesive	High-shielding conductive
Shielding Standard	IEEE 299-2006 Certified
Key Materials	Conductive (likely Nickel/Copper)
Special Variant	2" x 164ft conductive double-sided tape available

TitanRF™ Faraday Fabric

Often used with TitanRF™ tape, this fabric (e.g., TitanRF™ TechWeave) is typically made of Nickel, Copper, and Polyester. It's certified to MIL STD 188-125 and IEEE 299-2006. The tape is the simplest way to connect multiple fabric sheets. Woven types may fray, so careful handling is needed.

Material Compatibility

TitanRF™ tape is designed for TitanRF™ fabric, ensuring a continuous conductive barrier. The "extremely strong" adhesive creates a permanent bond.

 **Caution:** Once applied, tape is difficult to remove and may damage fabric. Plan and measure carefully!

Additional Sealing Materials

Mission Darkness™ TitanRF™ Faraday Foam Gasket

Professional-grade foam gasket for superior RF sealing:

Applications:

- Faraday enclosure lid seals
- Doorway gaskets for RF rooms
- Joint sealing between panels
- Forensic box rim seals
- Cushioning and gasketing applications

Specifications:

- Short: 20"L x 0.4"W x 0.47"H (box lids, small enclosures)
- Long Thin: 90"L x 0.75"W x 0.25"H (doorways, large enclosures)
- Long Thick: 90"L x 0.75"W x 0.5"H (heavy-duty applications)
- Peel-and-stick adhesive backing
- Compresses for tight RF seal
- Flexible for rounded surfaces

EMCaulk Conductive Caulk Systems

Professional electromagnetic interference sealing:

EMCaulk Standard (298ml):

- Flexible, durable, airtight seal
- Water-resistant and paintable
- Interior and exterior use
- Seals gaps, cracks, joints, penetrations
- Easy soap and water cleanup

EMCaulk Flex (298ml):

- Enhanced flexibility for dynamic applications
- Superior electromagnetic shielding
- Maintains seal under movement/vibration
- Ideal for demanding professional installations

ⓘ ⚠ SAFETY: All conductive materials are highly conductive and flammable. Keep away from electrical outlets and open flames.

Safety Precautions

TitanRF™ materials (fabric and tape) are conductive and flammable due to their metal content (Copper, Nickel). Handle with care!

Hazard Type	Warning Detail	Recommended Precaution
Electrical Conductivity	Material is highly conductive	Keep away from exposed electrical outlets, wiring, and any live circuits. The fabric will conduct electricity!
Flammability	Material is flammable	Keep away from open flames, sparks, or sources of ignition
Skin/Handling & Chemical	Contains Nickel/Copper (Prop 65 Warning for fabric). Skin oils can deteriorate fabric	Wear gloves during handling. Minimize dust if cutting (consider PPE/ventilation)

Pre-Installation Essentials

Receiving & Storing Materials

- Inspect fabric and tape for shipping damage (cuts, tears)
- Store in a clean, dry environment
- Protect from direct sunlight, extreme temperatures, and physical damage
- Keep conductive surfaces free from creases, dirt, and moisture

Essential Tools

- Sharp cutting tool (industrial scissors, utility knife)
- Measuring tape
- Cleaning supplies (isopropyl alcohol, lint-free cloths)
- Mission Darkness™ Taperator (recommended for 2" tape on large projects)
- Quality double-sided tape (e.g., 3M™ VHB™) for mounting fabric to non-conductive frames
- Staple gun (if applicable)

Surface Preparation

- Thoroughly clean all surfaces for TitanRF™ tape application
- Ensure surfaces are dry and free of dust, oils, grease, or contaminants

Poor prep leads to poor adhesion and RF seal failure.

Installation Procedures

- ❏ **Important:** Mission Darkness™ TitanRF™ Faraday Tape products include instruction sheets. This is your primary guide. If missing, contact Aus Security Products before starting.

General Tape Application Process

01

Cut the Tape

Use a sharp tool for clean, straight edges

02

Peel the Backing

Carefully remove backing, avoid touching adhesive

03

Adhere to Surface

Apply to a clean, dry surface. Use firm, even pressure

Sealing TitanRF™ Faraday Fabric Seams

This is a primary use of the tape. Follow these steps for a robust, conductive seal:

- 1 Prepare & Overlap Fabric**
Cut sheets, overlap edges 1-2 inches. Handle fraying woven fabric carefully.
- 2 Apply Tape (Side 1)**
Peel backing, apply tape along the seam, covering the overlapped edge smoothly.
- 3 Apply Tape (Side 2)**
Turn fabric over, apply tape to the reverse side of the seam, mirroring the first application.
- 4 Ensure Full Coverage**
Inspect! All raw fabric edges must be completely covered. No gaps!
- 5 Press Firmly**
Apply firm, even pressure along the entire taped seam on both sides for maximum adhesion.

Best Practice: We always recommend taping both sides of every seam, since that prevents discontinuities and ensures consistent shielding.

Using the Taperator (for 2" Tape)

For large projects, the Mission Darkness™ Taperator (for 2" x 164' tape rolls only) improves efficiency and accuracy.

- Provides fast, easy tape application to walls and corners
- Helps avoid RF leakage from manual application inaccuracies
- Features retractable creasing wheel and cut-off blade
- Consult printed instructions on Taperator's rim

DIY RF Enclosures: Core Principles

The goal is a complete, uninterrupted conductive barrier.

- Fabric forms main surfaces; tape seals ALL seams, joints, openings, edges
- Even tiny gaps compromise shielding. Thoroughness is critical
- For devices: wrap like a present, seal completely with tape
- For rooms: Meticulously seal every panel, corner, and entry point

WHY TWO-LAYER SHIELDING IS RECOMMENDED

- Ensures consistent shielding across all seams
- Prevents discontinuities in the conductive barrier
- Compensates for minor installation imperfections
- This ensures a complete conductive shield.
- Creates redundant protection against RF leakage

- ❏ **Using Staples:** If using staples to affix fabric (e.g., to a wooden frame), it is absolutely crucial to cover every staple and the surrounding area thoroughly with TitanRF™ Faraday Tape. Each staple creates a puncture that must be sealed to maintain RF shielding integrity.

Advanced Installation Techniques

Fastening Methods

Stapling (Preferred Method):

- Stapling is preferable for fabric attachment
- Most construction adhesives are insulative and can seep into the fabric, disrupting electrical continuity
- Certain conductive glues have been used successfully, but are not typically used in construction installation
- Staples work well as long as all penetrations are securely covered with TitanRF tape

Layer Compression and Bonding

Compressed Installations:

- In practice, double-sided conductive tape is strongly recommended for adhering fabric layers to each other
- This guarantees continuous electrical contact even if there are small voids or uneven compression

Seam Overlap Techniques

Standard Overlap:

- An ~2 inch overlap is correct for all seam connections
- **Best practice:** Tape both sides of every seam wherever possible
- Double-sided tape applied between the layers at each seam provides extra assurance
- The key is ensuring a continuous conductive path across every joint

Double-Sided Wall Panel Optimization:

- To reduce both labor and tape usage for double-sided wall panels, utilize conductive double-sided tape at the seam between the two layers (must be conductive tape)
- This requires only three tapes total: one on the interior side, one between layers, and one on the exterior side
- The double-sided tape keeps the two layers in close contact, which improves shielding performance

Material Compatibility and Corrosion Prevention

Galvanized Steel Framing:

- Isolating RF fabric from direct contact with galvanized steel (zinc-coated) framing is recommended for permanent or long-term installations
- Galvanic corrosion can occur between the Faraday fabric (primarily copper and nickel) and galvanized coating (zinc)
- Even in dry environments, the anodic voltage between these materials can cause corrosion
- Using barrier tapes to separate the two layers is generally the easiest and best solution

Metal Compatibility with TitanRF™ Fabric:

This table shows the compatibility of different metals with TitanRF™ fabric (which contains copper and nickel) to prevent galvanic corrosion.

Metal Type	Recommendation	Notes
Stainless Steel	Excellent	Very corrosion resistant
Iron/Steel (non-galvanized)	Good	More susceptible to oxidation over time
Copper	Good	Compatible material
Brass	Good	Compatible material
Galvanized (zinc)	Avoid	Can cause galvanic corrosion
Painted/Anodized	Avoid	Insulative finishes impact shielding

Guidelines:

- While galvanic frames can transmit galvanic voltage through fixings and begin corroding Faraday fabric, the rate of corrosion is drastically reduced due to smaller surface area contact
- Best practice: Avoid galvanized materials for any fixing that penetrates Faraday fabric
- Ensure all penetrations are taped over to maintain shielding
- Plasterboard, drywall, and wood don't cause problems with fixings or corrosion

Screw Penetrations in Wall Systems

Impact on Performance:

- Small, well-spaced screw penetrations should only marginally affect TitanRF fabric's effectiveness and attenuation - *However please consider your shielding attenuation requirements.*
- Holes can impact shielding attenuation. *Please consider your desired shielding attenuation.*

Risk Mitigation:

- Biggest risk is screws catching on fabric and ripping panels
- Pre-drilling holes and/or reinforcing areas where screws penetrate with additional tape are best countermeasures
- If panels are stapled down and firmly compressed, screw catching/ripping is unlikely
- Consider flipping plywood layer so fabric faces outward, away from screw path if feasible

Recommended Adhesives

Approved Adhesive Types:

- **3M acrylic adhesives** Recommended for various build environments
- **3M neoprene adhesives** Choose variety that suits application method best

Adhesives to Avoid:

- **Epoxies** Can be insulative
- **Solvent-based rubber cements** Not recommended for this application
- **Most construction adhesives** Often insulative and can disrupt electrical continuity

Neoprene Adhesives - Special Considerations:

- Avoid or use sparingly in:
 - EMP-rated SCIFs requiring full lab certification
 - High-temperature or high-humidity enclosures
 - Installations where the adhesive layer becomes the RF contact point
- **SCIF adhesive spray**
- **Yshield PSA roll on adhesive** - Available at [Aus Security Products](#)

Adhesives that should NOT be used

- ❏ **CRITICAL WARNING:** The following adhesives can compromise RF shielding performance and should be avoided:

Prohibited Adhesive Types

- Spray adhesives (including 3M-style aerosol contact adhesives)
 - Can penetrate deep into fabric weave
 - May create insulative barriers between conductive fibers
 - Can destroy electrical continuity across the material
- Construction adhesives (MS polymer, polyurethane, silicone-based)
 - Inherently insulative materials
 - Can seep into fabric, coating individual fibers
 - May block conductive pathways essential for RF shielding
- Hot-melt glue
 - Non-conductive thermoplastic
 - Can solidify around fibers, creating insulation
 - May prevent metal-to-metal contact required for shielding
- PVA / wood glue
 - Water-based and highly penetrative
 - Can soak deeply into fabric structure
 - May leave insulative residue when dry
- Rubbery, foaming, or elastic adhesives
 - Can expand and creep over time
 - May trap moisture against conductive materials
 - Can cause long-term degradation and corrosion
 - May lose dimensional stability

Approved Adhesive Usage Guidelines

- Use adhesive as a positioning aid — not the sole bonding method.
- Apply adhesive to substrate only

Why These Adhesives Can Fail

These adhesive types can compromise RF shielding through four critical failure modes:

- Fiber Penetration - They can soak deep into the fabric weave, coating individual conductive fibers
- Electrical Insulation - They can create non-conductive barriers between metal fibers, breaking the continuous conductive path
- Dimensional Creep - They can shift and deform over time, creating gaps and discontinuities in the shield
- Moisture Entrapment - They can trap humidity against conductive materials, accelerating corrosion and degradation

- ❏ **Critical Note:** Even small amounts of these adhesives can create localized "dead zones" where RF signals may penetrate. This is why stapling remains the preferred mechanical fastening method, with all penetrations immediately sealed using TitanRF Faraday Tape to maintain continuous conductivity.

Post-Installation: Care & Repair

Maintaining Taped Seams & Surfaces

- Regularly inspect taped seams for peeling, lifting, cracks, or damage
- Pay attention to areas with frequent contact, movement, or abrasion
- Avoid sharp objects near fabric/tape to prevent damage
- If tape fails, it's often due to initial application issues or excessive stress

Long-Term Care for TitanRF™

- Prevent exposure to rain, high humidity, chemicals, and contaminants
- Cleaning: Gently wipe with a soft, damp cloth if necessary
- NO washing machines or heavy scrubbing
- Handle with gloves for repeated direct contact to prevent oil degradation

Repairing Punctures or Damage

TitanRF™ Faraday Tape is ideal for repairing punctures in fabric or bags.

01

Clean Area

Thoroughly clean around the damage. Ensure it's dry and contaminantfree.

03

Apply Patch Firmly

Carefully apply tape over damage, pressing firmly for a good seal.

02

Cut Tape Patch

Cut tape generously larger than the damage, allowing substantial overlap.

04

Patch Both Sides (Optional)

If accessible, apply tape to interior and exterior for a robust repair.

Optimal Performance & Longevity

Best Practices for Max Shielding

Meticulous Sealing

No gaps in tape on any seam, joint, or opening

Adequate Overlap

Overlap fabric sheets 1-2 inches before taping

Double-Sided Taping

Apply tape to both sides of fabric seams

Shielded Penetrations

Use RF-tight glands/filters for cable pass-throughs

Effectiveness Testing

Test completed enclosure (signal analyzer or wireless device test)

Factors Affecting Durability

- Quality of initial installation (prep, technique)
- Physical stress, abrasion, punctures post-installation
- Environmental exposure (moisture, chemicals, extreme temps)
- Frequency and type of use (static vs. dynamic)
- Material choice (e.g., TitanRF™ TechWeave for durability)
- Inherent material lifespan (degradation over time)

Troubleshooting Suspected RF Leakage

01

Visual Inspection

Check seams, corners, entry points for breaches, peeling tape, damage

02

Closure Integrity

Ensure openings (doors) are securely and correctly sealed

03

Taperator Use Check

Review Taperator-applied areas for centered, well-adhered tape

04

Re-Test Systematically

Try to isolate the leak source by testing sections or specific items

05

Material Condition

Examine fabric for punctures or damage post-installation

Disclaimer

Please note that Aus Security Products personnel are not certified engineers and can only provide general support and ideas which should not be relied upon or implemented in lieu of consulting a specialist consultant/engineer or electrician or other qualified technician. Aus Security Products assumes no responsibility or liability for any issue or problem which may arise from any repair, modification, installation or other work done based on this knowledge base. Any product eligibility information provided here is based on general application guides. Each project is different and may require unique considerations due to the environment, attenuation expectations and substrate surfaces. Your own testing for suitability will need to be carried out.

Contact & Support

Meticulous installation, adherence to safety, and proper care are vital for effective, longlasting RF shielding with Mission Darkness™ TitanRF™ materials. Always prioritize the manufacturer's included instruction sheet for TitanRF™ Faraday Tape for product-specific details.

For project-specific advice or questions:

sales@aussecurityproducts.com.au

We are here to help you achieve the best results with your RF shielding project.

Always refer to official manufacturer documentation for Mission Darkness™ product specifics. For project support, contact sales@aussecurityproducts.com.au.