



Firezat, Inc

Next Generation Structure Wrap



The United States Forest Service Has Used Aluminized Structure Wrap To Protect Critical Structures From Ember Attack, Radiant Heat, and Direct Flame Impingement for Over 25 Years

Aluminized Structure Wrap
Protecting Lives and History

History

Performance

- Design Opportunities
- Design Improvements
- Foam Vs. Wrap Analysis

Testing

- Radiant Heat
- Firebrands
- Durability

Use Tips

- Deployment
- Anchoring
- Roll & Store

Use Space Bar to Advance
Esc to Exit



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Next Generation Structure Wrap

Aluminized Structure Wrap Protecting Lives and History

Advantages

- **100 % Environmentally Friendly**
- Can be Deployed Well in Advance of a Threat and Left Up for Days, Weeks, or indefinitely. Always Effective
- Requires No Water or Power To Protect • Reusable

It's Used When:

- Structure Protection is Too Dangerous For Crews
- Not Enough Crews & Equipment are Available
- High Value Assets, Historical are Threatened
- Water & Power Is Scarce
- Time For Fire Arrival Varies Greatly
- Protecting Structures For Burn Outs- Preemptive



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Structure Wrap Was First Used In 1988 During The Yellowstone National Park Fires. Historic Structures Were Threatened And Crews Had To Leave. They Cut Up Their Personal Fire Shelters And Stapled Them To The Buildings. The Buildings Were Spared.



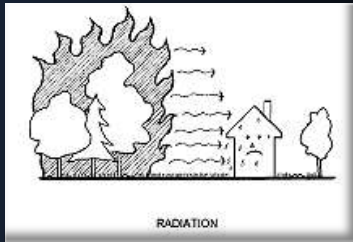
The Product Remained Undeveloped Until Firezat Reengineered It Using Modern Technology To Improve Performance And Availability To The General Public



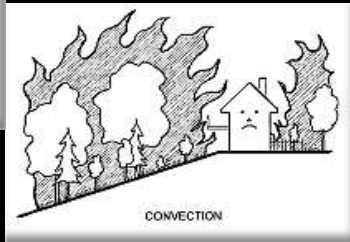
Fire Shields Protect Structures From:

Firebrands

Radiant Heat



Convective Heat



Extremely Low Relative Humidity 6 to 9%

High Temperatures 90°F Plus

High Winds 30 to 60 MPH Plus

Loss of Power, Water Pressure & Supply

Ample Dry Fuel – Usually Drought Conditions

Firebrands Travel Over a 2 Miles and Start Spot Fires

Limited Access via Roads or Air Support

Extended Exposure To All These Elements

Characteristics of a Wildfire
As They Affect a Structure

Aluminized Structure Wrap Reflects
96% of the Radiant Heat &
92% of Convective Heat

Structure Wrap Protects Structures
From Firebrands- Proven to Cause
80% of Structure Fires- Spot Fires-

Requires No Water or Power –
Can Be Left Up For Days, Weeks, or
Months

Fire Shields Deny or Limit Oxygen
Defeating Ignition
Breaks Fire Triangle

The Old Way



The New Way



Structure Wrap Compared To Gels And Foam

Gels & Foam

- Requires Professional Application For Optimum Depth for Performance
- Must Be Applied Within A Couple Hours of The Fires Approach
- Single Use Must Buy More For Next Threat
- A Significant Water Supply – Pool Pond Lake or River
- Electrical Generator & Pumps In Power Outage
- Water Pressure - 30 PSI Will Give You 10 Feet Of Reach
- Calm Winds - Difficult To Apply In Strong Winds
- Endangers Crews & Homeowners Waiting Until The Last Minute
- After Use Gel Must Be Removed By Power Washing and Sometimes Power Steam Cleaning
- Can Cause Discoloration of Older Painted Surfaces or Untreated Wood- Limited Protection on Glass – No Protection of Attic Vents
- If Fire Front Stalls or Turns Gel Can Evaporate. Evacuations & Traffic Blocks May Prevent Rehydrating In Time

Structure Wrap

- Can Be Installed By Homeowners
- No Water Required
- No Pumps, Generators, or Power Required
- Can Be Installed When Winds are Calm
- No Fear of Evaporation
- Homeowners and Crews Can Deploy at First Sign of Danger in Hours
- Removal is Fast & Easy
- Minimal Damage To Structure if Sandbags and chicken wire are Used
- Can Be Left Up For Days or Weeks With Zero Performance Loss
- Protects Attic Vents & Windows
- ZERO Environmental Impact
- Stored For Next Use, Reusable for Years With Care in handling



Power Poles
Often Burn
Miles Away
Cutting Power
for Tools &
Pumps



Firezat Fire Shields

1. Optimum Aluminum Layer For Maximum Radiant Heat Reflection
2. Woven substrate Material For Superior Durability and Convective Heat Resistance
3. Custom High Temp Adhesive and Lamination Process for Superior Performance

Rolled for Shipping & Storage
1,000 Sq. Ft 47 Lbs.



Fire Shield Roll

5' X 200'

1,000 Sq Ft

47 Lbs.

Fire Shields can be reused and stored for extended periods of time and will not support mold or mildew. They are resistant to acids, alkalis, & solvents with the exception of hydrofluoric acid.

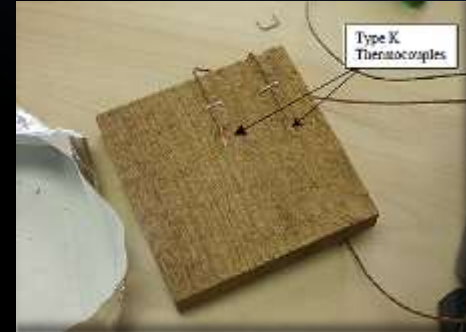


Cone Calorimeter Used for
Evaluation of Firezat Samples



Exposed to 33 kW/m² Heat Flux (625C Cone Temp)
for 600 seconds (10 minutes)

Radiant Heat Test



Kiln Dried Cedar 8 to 10% Moisture Content
Thermocouples Measure Heat at Edge and Center



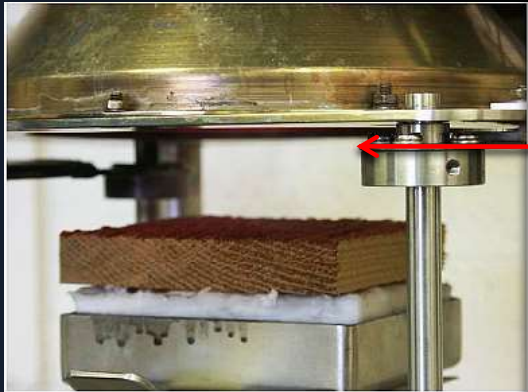
Flame in 34 Seconds

Establishing a Baseline

Most Wildfires Pass Through in Approx 3 to 5
Minutes With 2 to 3 Minutes Of Preheating

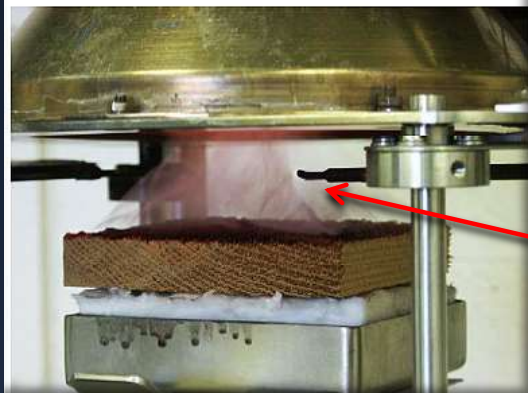
Wood Will Combust Approximately 575° to 600 F
Depending on Moisture

Goal is to Keep Heat Below Combustion
Temperature For At Least 10 Minutes



Established Base line
Radiant Heat 1157 F

Samples Were Exposed to 625
Degrees C (1157 F) of Radiant
Heat For 10 Minutes to Simulate a
Passing Fire

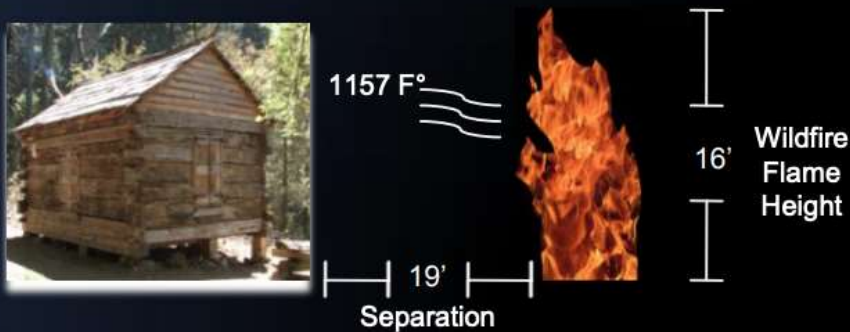


Off Gassing Organic
Compounds within 10
Seconds. Igniter Simulates
Firebrand

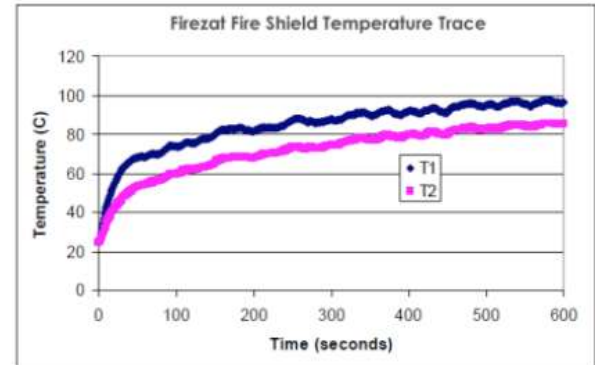


Results of Radiant Heat Test

Unprotected



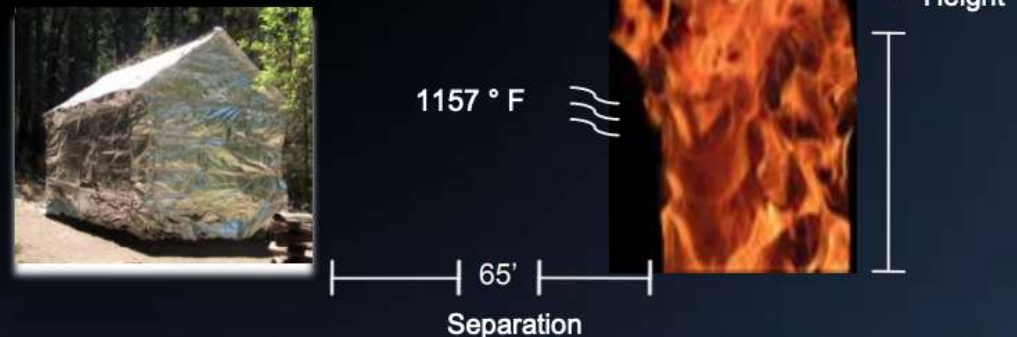
After 34 seconds exposure to this high heat, tests show unprotected cabin would ignite as wood reaches its flash temp approaching 575° F to 600 °F. Example shows results if a 16' flame was within 19' of the structure.



Material Exposed at 33 kW/m2 Heat Flux for 10 minutes (625C - 1157F Cone Temperature)

Protected

After 10 minutes exposure to the same high radiant heat, tests show the temp under the shield would only rise to 212°F and after 20 minutes only 248° F. Far below flash temp. Allowing fire to pass through.



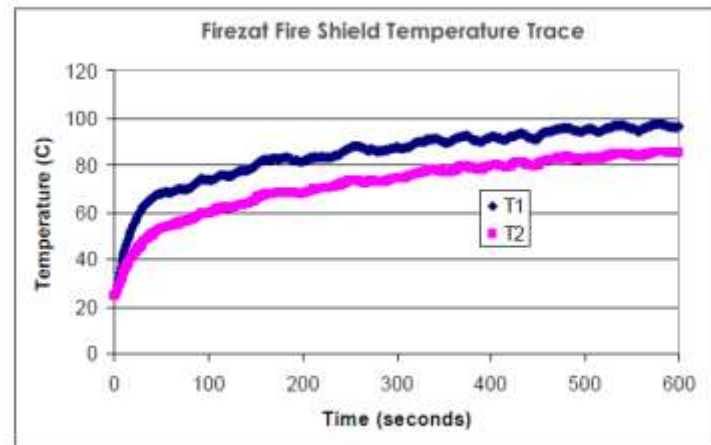
Note: Radiant temp is statistically the same and regulated by flame height and separation distance. Scenarios are interchangeable.



Mumford Bar Cabin



Results of Radiant Heat Test



Material Exposed at 33 kW/m² Heat Flux for 10 minutes (625C - 1157F Cone Temperature)

Conclusions:

- Exposure to 1157° F Equivalent of :
- 5m Flame With 6m of Separation or;
- 32 foot Flame With 65 feet Separation

Temp Rise After 10 Minutes 100C (212F)
Between Shield and Wood

After 20 Minutes Temp Rise of 120C (248F)

After 20 Minutes Well Below 575 ° Required For
Combustion. Can Keep Temperature Below Combustion
Point Long Enough For Fire To Pass Through

Fire Shields Protect



More Than You Think

- Historical Structures
- Homes
- Cabins
- Bridges in Parks
- Roofs
- Walls
- Fences
- Railings & Decks
- Structure Supports
- Trees
- Railroad Trestles
- Microwave Equipment
- Broadcast Equipment
- Art Sculptures
- Propane Tanks
- Solar Panels
- Power Poles
- Attic Vents
- Windows
- Eaves
- Sliding Glass Doors
- Fences
- Beehives
- Gazebos
- Trailers
- Airplanes
- Business Inventories
- Equipment

Water Saturation Strategy

Remember You Can Boil Water In A Paper Cup Over An Open Flame

By Placing HD Soaker Lines On The Roof Peaks Under The Fire Shields You Provide A Water Curtain That Will Deny Oxygen, Dissipate Heat, & Saturate Wood (Fuel)

- 50' Soaker Hose
- Hose Provides A Water Curtain Barrier
- Up to 450 Gal/Hr Under The Fire Shields
- Shields Trap Moisture- No Evaporation, Denies Oxygen, Dissipates Heat- Defeats Ignition
- Worst Case Scenario Extreme Heat Creates Steam Which Recirculates Under Shields



Breaking the Fire Triangle



Installation Tips and Tricks

1. Have a Plan
2. Do 1 panel or House Facing, Front, Back, or Side, at a time
3. Measure and cut to length

Cover any sharp edges that might tear the material with duct tape or rags. Be careful that the shields do not catch on vent pipes or other obstacles.



If you are using water under the shields, highly recommended, place your hose on each side of the roof peak with the sprinkler holes facing down. Do not turn on the water until you are done. **SHIELDS ARE EXTREMELY SLIPPERY WHEN WET!**



Next unpack your fire shields and carry them to the roof. Unroll the shields anticipating where the edges will be when you unfold the wings.



Anchor the top part of the shields with sandbags or weights before you allow the bottom half to hang over the eave. Allow enough material to tuck under the eave at 45° angle, go down the wall at least 3 feet. Allow path for the water to flow against the wall under the shields for maximum protection.



Use the staples to tack shield material on all seams. Remember winds can and will blow up to 60 miles per hour OR MORE during the fire. Make sure all seams and edges are secure and there are no holes where embers can enter. For best result use chicken wire or seams and eaves.



To wrap your walls or work in winds simply start at one edge and tack the material to the wall. Work around the house and try to extend past the foundation by 2 feet for anchoring room. Use chicken wire for best wind protection.



Fasteners

There are many different ways to secure the shields. While the best is staples & Chicken wire, here are several other methods or items to consider.



- Staples
- **Chicken Wire**
- Sandbags
- Tie wire
- Chains (Around Skylights)
- Rocks
- Double Sided Tape
- Pony Clamps
- Pipes or bars
- Dirt

Fasteners and Tricks

Tricks

Twin Rolling Shields for Roof Placement - Unroll shield with aluminum side up. Roll both ends to the center so shield looks like a scroll and tie strap around to hold together. Carry to roof and place on peak. Remove tie and shield will roll down each side.



Deploying in Wind - Prep site for wrapping and start at dawn or dusk when winds are quietest. Secure shield with banding on one end of structure, starting on windward or upwind side. Deploy wrap and secure every few yards. HD material deploys much better in wind.

Wrapping Eave Overhangs - When shields overhang from roof to eave allow enough material to stretch down at 45° angle before attaching to structure. This allows heat to rise and be deflected away from under eave.

Bolero Over Weak Roofs — When wrapping weak roofs you can attach lines to the shields with clamps and tie a weight to the other end. Throw the weight over the structure and pull shields over. Use a long broom or stick under the eave feeding the shield to prevent it catching on gutters.

High Temp Foil Tape for Repairs — High temp foil tape can be used to repair any tears or staple holes in shields extending service life. We recommend Nashua 324-A Foil Tape Rated to 320 F 2.5" X 60 Yards.

Warranty Disclaimer Policy

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As a condition of any sale the Customer agrees and accepts all conditions, requirements, limitations, and terms as stated in the Firezat Disclaimer document and the Firezat Limitation of Liability statement located on the company website, and agrees and understands that acceptance of these conditions are required and mandatory in order to conduct business with Firezat or its suppliers and vendors.

THANK YOU

