

**USA Headquarters**

DFW International Commerce Park
2580 Esters Blvd., Suite 100
DFW Airport, TX 75261
FedEx and UPS Shipments

Mailing Address

P.O. Box 3467
Coppell, TX 75019
US Postal Service

Alternative Compliance Request Narrative

Prepared for submittal with the applicable land use application in support of an Alternative Compliance request under Mesa Site Planning and Design Standards.

1. Project Information

Project Name: Magna Steyr Canopies

Address: 7237 Pecos Rd, Mesa, AZ

Application Type: Administrative Development Plan Modification

Applicant: Caroline Hancock

General Plan Placetype: Industrial

2. Request Summary

This narrative is submitted with the planning application request Alternative Compliance for design standards applicable to the proposed canopy structures and the Magna Steyr site. This request pertains to planning comment IDs 4, 5, 6, and 7 and addresses the City's concerns regarding durable material, publicly visible façade material composition, architectural metal coverage, and roof material requirements. We propose a permanent open-air canopy system utilizing an engineered shade membrane and steel support structure in lieu of a conventional enclosed building or solid metal-roofed structure. As described below, we reason the proposed alternative satisfies the intent of the applicable standards by providing a durable, high-quality, climate-appropriate improvement that is visually cohesive, functionally appropriate for the site, and equivalent to or better suited than a traditional building-form solution for this specific use.

3. Code Sections and Development Standards

This request applies to the following Mesa Zoning Ordinance provisions cited in Planning Comment IDs 4, 5, 6, and 7:

MZO Section 11-7-5(D), Materials. Buildings and structures shall be constructed of durable, high-quality materials appropriate for the Arizona climate.

MZO Section 11-7-5(D)(2), Publicly Visible Façades. Publicly visible façades must incorporate at least two different primary exterior building materials, and primary exterior materials shall cover no less than 75% of each building façade.

MZO Section 11-7-5(D)(3), Architectural Metals. Architectural metals, such as bronze, brass, copper, aluminum, metal-composite material (MCM), and steel shall not cover more than 25% of a building façade.

MZO Section 11-7-5(D)(5), Roof Materials. All visible pitched roofs shall consist of metal seam, clay tile, concrete tile, or a similar grade of roofing material.

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Applicable development standard(s) for which Alternative Compliance is requested: application of the above façade and roof material standards to a permanent open-air canopy structure rather than a conventional enclosed building.

Numeric modification(s) requested: relief from strict application of the façade material composition and architectural metal percentage standards to the canopy system as proposed.

4. Proposed Alternative

The applicant proposes the following alternative compliance approach for the open lot:

- Installation of permanent open-air canopy structures over the vehicle storage areas instead of a traditional enclosed building or solid metal-roofed structure.
- Use of an engineered high-density polyethylene (HDPE) shade membrane, or approved equal, specifically manufactured for permanent architectural shade applications and long-term exterior exposure.
- Use of a steel support system designed as a minimal structural framework necessary to support the canopy membrane while maintaining an open and visually permeable site character.
- Alternative treatment of façade-based material standards to recognize that the proposed structure does not function as a conventional building façade and is instead a non-enclosed shade system with limited vertical surface area.
- Alternative treatment of roof material standards to allow the engineered shade membrane in place of the conventional pitched roof materials otherwise contemplated by the code.
- Referenced drawings or exhibits: canopy plan sheets, elevations, material specifications, and manufacturer testing documentation included with the submittal.

5. Explanation of Intent

This request is based on the physical characteristics and intended function of the project. The proposed improvement is a permanent open-air canopy system serving an existing automobile storage lot, not a conventional enclosed building with occupiable interior space, walls, or traditional façades. Because the code provisions cited in Comment IDs 4, 5, 6, and 7 are primarily written for building envelopes and pitched roof assemblies, strict application of those standards to a shade canopy would not result in a more context-appropriate or higher-performing design. Requiring the canopy to mimic an enclosed building through additional façade cladding, masonry application, or conventional roof materials would add bulk and

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complexity without improving the functionality, appearance, or environmental performance of the proposed installation. The requested alternative instead allows the project to use durable, tested, and climate-responsive materials specifically developed for permanent shade structures while preserving the open character of the site. A solid-roof or heavily clad structure would create additional visual mass and would not better support the operational purpose of the installation. Metal roofing system can absorb and radiate heat, while also trapping heat underneath. The proposed shade membrane avoids this effect by allowing ventilation and minimizing heat retention, thereby improving thermal conditions at ground level. The proposed system utilizes durable, engineered materials designed for permanent exterior use and supported by recognized performance standards, ensuring a safe, climate-responsive, and long-lasting installation.

6. Explanation of Alternative

The proposal meets the intent of the applicable development standards, the applicable General Plan Placetype, and any applicable Sub-area Plan by delivering a cohesive, attractive, and context-sensitive shade solution for an open lot while avoiding unnecessary mass and enclosure.

- How the proposal meets the intent of the standards: The cited standards are intended to ensure durable construction, visual quality, and cohesive site design. The proposed canopy system achieves those objectives through a permanent, engineered architectural shade structure specifically selected for long-term exterior use.
- Response to Comment ID 4 – durable, high-quality materials: The proposed shade membrane is not a temporary fabric product. It is an engineered material manufactured for permanent architectural shade applications, with documented resistance to UV degradation, tearing, fraying, fading, and wind exposure. In combination with the structural steel support system, it constitutes a durable and climate-appropriate assembly for Arizona conditions.
- Response to Comment ID 5 – publicly visible façade materials: The canopy does not present building façades in the same manner as an enclosed structure. Its visible surfaces are limited to the membrane and support framing necessary to create shade over the open lot. Applying traditional façade composition requirements to this non-enclosed structure would not improve site design and would instead impose building-oriented treatments on an improvement whose defining feature is openness and visual permeability. The proposed design nevertheless achieves a cohesive appearance

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through a consistent material palette, coordinated structural expression, and a clean, orderly visual profile along Pecos Road.

- **Response to Comment ID 6 – architectural metal percentage:** The steel support members function as structural elements rather than decorative façade cladding. Because the canopy lacks conventional building façades, the architectural metal percentage standard cannot be meaningfully applied in the same way it would be for a wall surface. The limited structural framework is the minimum necessary to support the canopy system and avoids the appearance of a bulky or overbuilt structure.
- **Response to Comment ID 7 – roof materials:** The code’s listed roof materials are intended for visible pitched roofs on conventional buildings. Here, the proposed membrane performs the roof-like function of providing overhead coverage and solar protection, but it does so through an engineered tensile material designed specifically for permanent shade structures. This alternative is better suited to the project type and offers climate-responsive performance benefits, including reduced heat gain and improved shaded comfort.
- **Reduced massing and scale:** Compared to a solid metal roof or enclosed structure, the proposed canopy is significantly less bulky and maintains a lighter visual presence on the site.
- **Context-sensitive design:** The open-air canopy is appropriate for an automobile staging use and preserves the functional and visual character of the site without introducing unnecessary enclosure.
- **Material durability and code responsiveness:** Supporting product data identifies the proposed membrane as complying with recognized fire performance standards, including NFPA 701 and ASTM E84 testing, and as engineered for long-term outdoor exposure. These performance characteristics support the conclusion that the material is suitable for permanent installation and consistent with the intent of the City’s quality design requirements.
- **General Plan Placetype / Sub-area Plan consistency:** The proposal remains consistent with the site’s Industrial placetype and applicable planning area policies by providing a functional site improvement that enhances operations while maintaining an orderly, high-quality, and context-appropriate appearance.

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The proposed canopy system provides an equivalent or superior level of durability, visual quality, and climate responsiveness compared to the conventional building materials and roof forms contemplated by the code.

7. Statement of Compliance with Approval Criteria (MZO 11-7-5(C))

- The proposed open-air canopy structures do not create adverse impacts related to safety, access, visibility, glare, privacy, noise, drainage, or pedestrian comfort.
 - The canopy system is engineered for structural stability and long-term exterior use, meeting applicable safety and fire performance standards.
 - The open design maintains clear visibility across the site and does not obstruct access or circulation.
 - The shade membrane reduces glare and solar exposure rather than contributing to it.
 - The structure does not introduce noise, privacy, or drainage concerns.
 - The proposed shade membrane is permeable, allowing precipitation to pass through rather than collect or shed in a concentrated manner. As a result, the canopy will not modify existing drainage patterns or introduce additional runoff impacts.
 - The provision of shade improves thermal comfort and reduces localized heat island effects, enhancing overall site conditions.
- The requested Alternative Compliance represents the minimum deviation necessary to achieve the intent of the design standards while maintaining overall compliance with all other applicable standards.
 - The request is limited to roof material substitution and alternative application of façade and architectural metal standards for a non-enclosed structure.
 - All other applicable development standards remain fully compliant.
 - The deviation is necessary because the referenced code provisions are written for conventional buildings with enclosed façades and pitched roofs, whereas the proposed improvement is an open-air canopy system.
 - Applying those standards strictly would result in unnecessary mass and materials without improving functionality or design quality.
- The proposal meets equivalent quality and functionality.
 - The engineered shade membrane is a durable, high-performance material designed specifically for permanent outdoor architectural applications.
 - The canopy system provides effective weather protection and solar screening comparable to traditional roofing.
 - The structure is designed to perform reliably in Arizona's climate, including high UV exposure and heat conditions.

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- Provides enhanced shade and reduced heat gain, improving site usability and comfort
- Reduces overall visual mass and bulk compared to conventional roof structures
- Maintains an orderly, cohesive site appearance appropriate to the Industrial placetype

8. Related Documents

- a. Site Plan
- b. Architectural Plan
- c. Material Board
 - i. *Physical samples can be provided if requested
- d. Fabric – eXtreme 32 Specification
- e. Fabric ASTM E-84 Certification
- f. Fabric NFPA 701 Certification
- g. Fabric Projects Portfolio

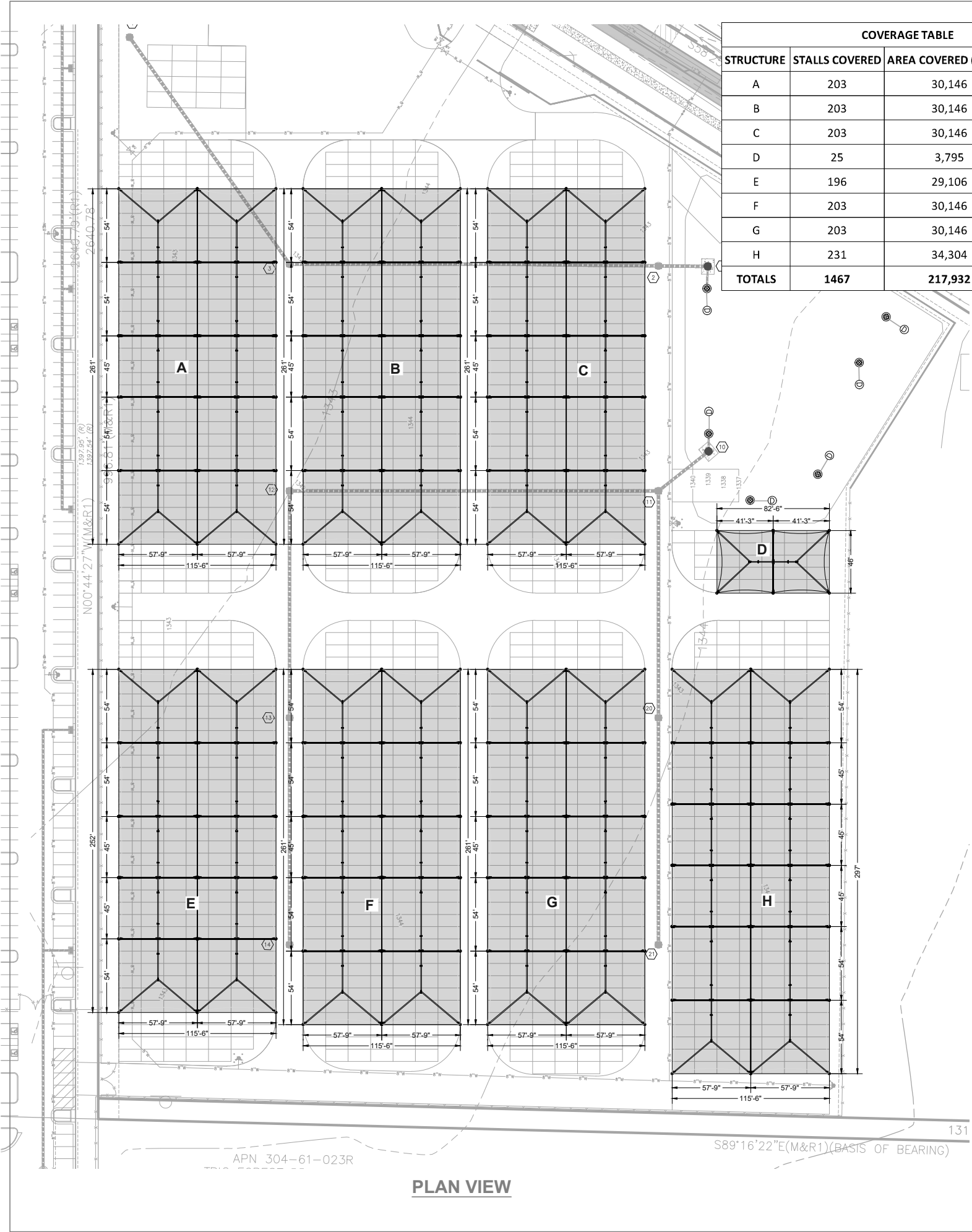
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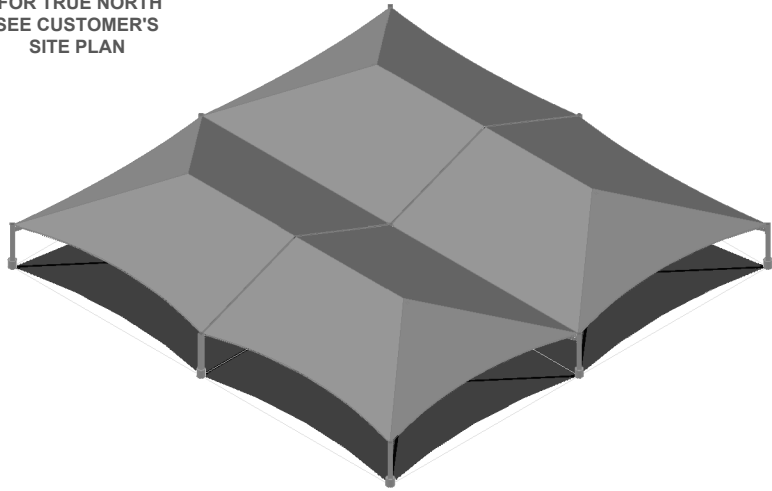
Site Plan & Material Board



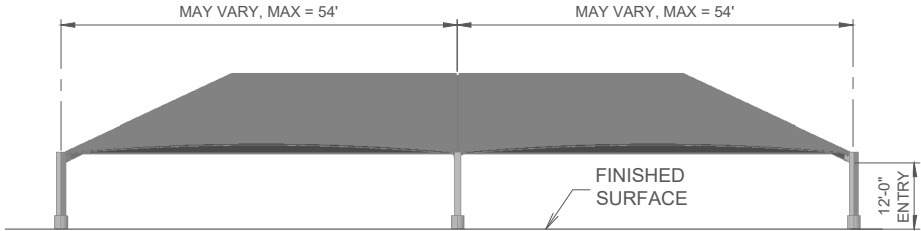
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STRUCTURE	STALLS COVERED	AREA COVERED (SQ.FT.)	NO.COLUMNS
A	203	30,146	18
B	203	30,146	18
C	203	30,146	18
D	25	3,795	6
E	196	29,106	18
F	203	30,146	18
G	203	30,146	18
H	231	34,304	21
TOTALS	1467	217,932	135



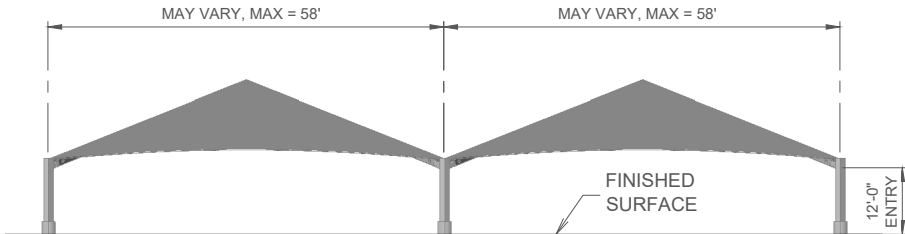
NOTES:
-THESE DRAWINGS ARE A PICTORIAL REPRESENTATION OF FABRIC AND STEEL ONLY. NONE OF THE REQUIRED ATTACHMENT OR CONNECTION DETAILS HAVE BEEN DEPICTED.
-ALL DIMENSIONS AND HEIGHTS MUST BE FIELD VERIFIED PRIOR TO ANY FINAL DESIGN, FABRICATION OR INSTALLATION WORK.



PERSPECTIVE VIEW
FOUR BAY SAMPLE



FRONT VIEW



SIDE VIEW

As manufactured and installed by VPS / Playpower
Email : Info@vpslp.com

CUSTOMER:

MAGNA STEYR

PROJECT NAME:

MAGNA STEYR

LOCATION:

MESA, AZ

STRUCTURE TYPE:

PANAMA SERIES

SIZE:

VARIES

THESE PLANS AND SPECIFICATIONS ARE THE PROPERTY OF SHADE STRUCTURES, INC. AND SHALL NOT BE REPRODUCED WITHOUT THEIR WRITTEN PERMISSION.

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VPS

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866-887-4233

CERTIFICATIONS:

IAS CERTIFICATION No: FA-428
CLARK COUNTY MANUFACTURER
CERTIFICATION NUMBER (NEVADA): 355

	JO	ENG
	BRETT	CHK
	OR	DRW
11/18/25	DATE	
	CONCEPT	DESCRIPTION
NC	REV	

Drawn By :

OR

Sales Mngr. :

BRETT

Approved By :

BRETT

DRAWING DESCRIPTION:

SITE LAYOUT

DWG.

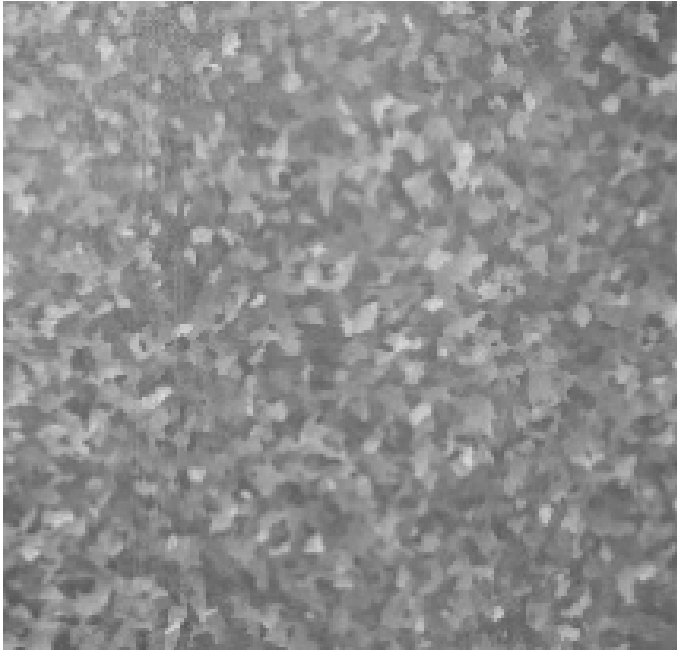
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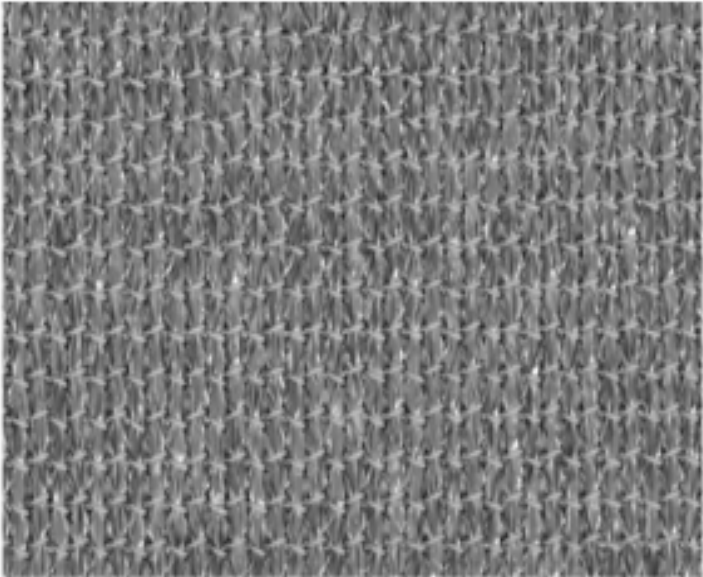
2000

REV.

NC



STEEL COLOR
HOT DIP GALVANIZED
KLOECKNER METALS



FABRIC COLOR
SILVER
EXTREME 32

CUSTOMER:

MAGNA
STEYR

PROJECT NAME:

MAGNA
STEYR

LOCATION:

MESA,
AZ

STRUCTURE TYPE:

PANAMA
SERIES

SIZE:

VARIES

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NC	REV	

Drawn By : OR	11/18/25
Sales Mngr. : BRETT	11/18/25
Approved By : BRETT	11/18/25

DRAWING DESCRIPTION:

MATERIAL BOARD

DWG.

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PAGE

3000

REV.

NC

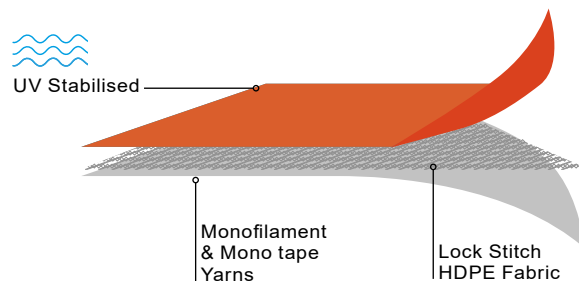
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Fabric Specifications/Brochure

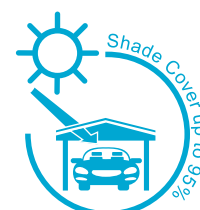


SPECIFICATIONS

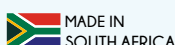
MATERIAL	UV-Stabilised HDPE
CONSTRUCTION	Monofilament and Tape Yarn
PATTERN	Knitted lock-stitch
TEMPERATURE RANGE	-25°C to +80°C
APPROXIMATE THICKNESS	1.7mm
CPI - COURSES PER INCH	12

PERFORMANCE

TENSILE STRENGTH - WARP	720N/50mm (AS 2001.2.3.1-2001)
TENSILE STRENGTH - WEFT	1720N/50mm (AS 2001.2.3.1-2001)
WING TEAR - WARP (mean)	255N (AS 2001.2.10-1986)
WING TEAR - WEFT (mean)	210N (AS 2001.2.10-1986)
TONGUE RIP - WARP	270N (ASTM D2261)
TONGUE RIP - WEFT	185N (ASTM D2261)
WIND TUNNEL TESTS	>200km per hour (performed by CSIR (SA))
PNEUMATIC BURST	420KPa (SANS 1703:2003)
HYDRAULIC BURST	3400KPa (AS 2001.2.4-1990 / ASTM D 3786-06 / ISO 13938-1:1999)
UVR BLOCKOUT %	Up to 97
SHADE COVER %	Up to 95



BASE MATERIALS:



- Virgin HDPE (High Density Polyethylene)
- Stentered Fabrics
- UV (Ultra Violet) stabilizers
- Colourants of high quality refined pigments with high light fastness properties, which provide excellent fade resistant and high tensile strength properties for the individual yarns in the knitted shade net fabric.

TECHNICAL FEATURES



- eXtreme 32 is a three bar knitted, lockstitch pattern, incorporating monofilament and monotype yarns for dimensional stability, tear and fray resistance.
- Our pattern gives excellent weft and warp stability, due to throw of the weft yarns across the knitting needles during fabrication of the fabric.
- The pattern design achieves high density coverage with the weft yarns, giving up to 97% UV block out.
- The eXtreme 32 fabric is heat set using a stentering process, giving additional dimensional stability and strength as a result of shrinking and equalizing the yarns lengths and knots in a three bar lockstitch pattern.
- The stentering of the eXtreme 32 fabric assists in eliminating sagging and looseness in the fabric after installation.
- eXtreme 32 is certified by the Southwest Research Institute Underwriter's Laboratory (UL) as UL 2218 Class 4.



eXtreme 32 Standard Range						Average GSM	Average Warp Break	Average Elongation %	Average Weft Break Strength kg	Average Elongation %	Average Burst KPa	Average Burst to Mass Ratio
	Colour	Width	Length	Shade %	UV Block %							
	Arizona	3m	50m			320	102	65	186	67	398	1.25
	Black	3m	50m	95	96	320	102	65	186	67	398	1.25
	Charcoal	3m	50m	94	96	320	102	65	186	67	398	1.25
	Cinnamon	3m	50m	89	92	320	102	65	186	67	398	1.25
	Desert Sand	3m	50m	91	92	320	102	65	186	67	398	1.25
	Navy Blue	3m	50m	94	95	320	102	65	186	67	398	1.25
	Rain Forest Green	3m	50m	90	92	320	102	65	186	67	398	1.25
	Royal Blue	3m	50m	86	92	320	102	65	186	67	398	1.25
	Silver	3m	50m	91	92	320	102	65	186	67	398	1.25
	Terracotta	3m	50m	93	93	320	102	65	186	67	398	1.25

eXtreme 32 Non-Standard Range						Average GSM	Average Warp Break	Average Elongation %	Average Weft Break Strength kg	Average Elongation %	Average Burst KPa	Average Burst to Mass Ratio
	Colour	Width	Length	Shade %	UV Block %							
	Atomic Orange	3m	50m			320	102	65	186	67	398	1.25
	Bleached Slate	3m	50m	83	97	320	102	65	186	67	398	1.25
	Bush Khaki	3m	50m			320	102	65	186	67	398	1.25
	Chocolate	3m	50m			320	102	65	186	67	398	1.25
	Craft Work	3m	50m	92	96	320	102	65	186	67	398	1.25
	Electric Purple	3m	50m	89	92	320	102	65	186	67	398	1.25
	Laguna Blue	3m	50m	90	91	320	102	65	186	67	398	1.25
	Mulberry	3m	50m	89	84	320	102	65	186	67	398	1.25
	Olive	3m	50m	88	92	320	102	65	186	67	398	1.25
	Red	3m	50m	90	95	320	102	65	186	67	398	1.25
	Rust Gold	3m	50m			320	102	65	186	67	398	1.25
	Sunflower Yellow	3m	50m	80	94	320	102	65	186	67	398	1.25
	Turquoise	3m	50m	92	85	320	102	65	186	67	398	1.25
	White	3m	50m	58	88	320	102	65	186	67	398	1.25
	Zesty lime	3m	50m	85	91	320	102	65	186	67	398	1.25



Easy Care & Maintenance



High UV Protection (up to 97%)



Durability & Longevity



Resilient Dimensional Stability



Extreme Strength



Heat Reduction



High Tear Resistance

eXtreme 32

COLOURSHADE



eXtreme 32 COLOURSHADE fabrics have an ultra high density lockstitch knitted pattern and are heat set for additional dimensional stability. These fabrics are used extensively for large tension structures, carports, shade sails, awnings and other types of shade covers.

		Metric		Imperial
		Fabric Weight		
Strip Test Method	(AS 2001.2.3.1-2001) ASTM D 5035-06 ISO 13934-1:1999	Breaking Force	weft	310-330 gsm 2050-2070N 460-465lbf
			warp	9.2-9.7oz/ft² 1125-1135N 253-255lbf
		Elongation	weft	46-55%
			warp	45-54%
Grab Method	AS 2001.2.3.2-2001 ASTM D 5034-06 ISO13934-2:1999	Breaking Force	weft	1500-1740N 337-391lbf
			warp	700-735N 157-165lbf
		Elongation	weft	23-24%
			warp	21-23%
Wing-Rip Test Method	AS 2001.2.10-1986	Tear Resistance	weft	205-210N 46-47lbf
			warp	245-255N 55-57lbf
Tongue Test	ASDM D 2261		weft	175-185N 39-42lbf
			warp	255-270N 57-61lbf
Hydraulic Burst	AS 2001.2.4-1990 (Method B) ASTM D 3786-06 ISO 13938-1:1999	Burst Strength		3400kPa 493psi
Burst Force 25.4 Steel Ball	AS 2001.2.19-1988			1800-2020N 405-454lbf
Pneumatic Burst	SANS 1703:2003	(200mm Coaxial Aperture)		400kPa 58psi
SABS 1703 Minimum Specified Burst Ratio		(Burst/Mass)		1,20 5.90
Actual Mean Burst Ratio		(Burst/Mass)		1,25 6.15
Wind Tunnel Test	Conducted by CSIR (SA) (max capability of LSWT)			>200km/h >124mi/h

All specifications have been compiled from results conducted by independent laboratories. The information thereof provided by this company is considered accurate. It also follows strict quality control standards to ensure that these specifications remain consistent and accurate, within a minimal variance. These results should therefore be used as an indication of the specifications of the fabric. By using this product, the user acknowledges that this company cannot be held responsible or liable in any way whatsoever should this information change in any way.

COLOURSHADE



ASTM E84 NFPA 701 UL 2218 (Class: 4)

Multiknit[®]
INTERNATIONAL



ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



DECORATIVE SHADE NETTING

Brought to you by



CHOOSE FROM A VARIETY OF DIFFERENT COLOURS
OUR SHADE NET INCORPORATES A KNITTED LOCK STITCH
WITH A MONOFILAMENT AND TWO TYPE YARNS FOR
DEMINSIONAL STABILITY, TEAR AND FRAY RESISTANCE
Our PATTERN GIVES EXCELLENT WEFT AND WARP STABILITY
PROUDLY MANUFACTURED IN SOUTH AFICA



Since 1964



STANDARD PRODUCT RANGE

ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



STANDARD PRODUCT RANGE



	TOP	BOTTOM
Black		
Bush Khaki		
Charcoal		
Chocolate		
Cinnamon		
Desert Sand		
Navy Blue		



	TOP	BOTTOM
Rain Forest Green		
Red		
Royal Blue		
Rust Gold		
Silver		
Terracotta		



NON-STANDARD PRODUCT RANGE

ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



NON-STANDARD PRODUCT RANGE



	TOP	BOTTOM
Acacia		
Arizona		
Atomic Orange		
Electric Purple		
Laguna Blue		
Mulberry		



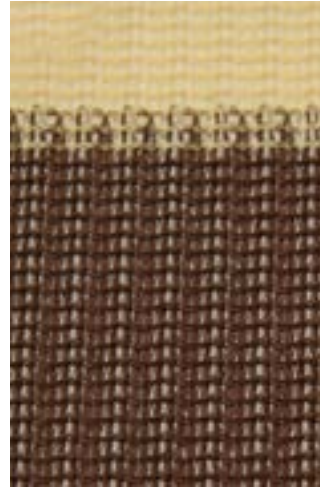
Olive		
Red Earth		
Sunflower Yellow		
Turquoise		
White		
Zesty Lime		

Brown/Beige

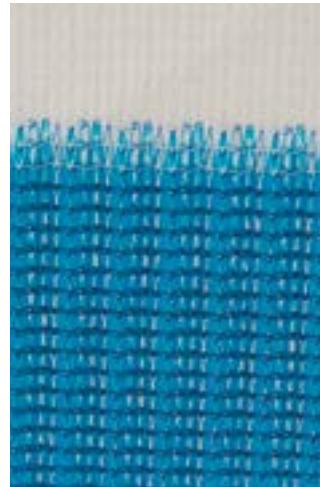
TOP



BOTTOM

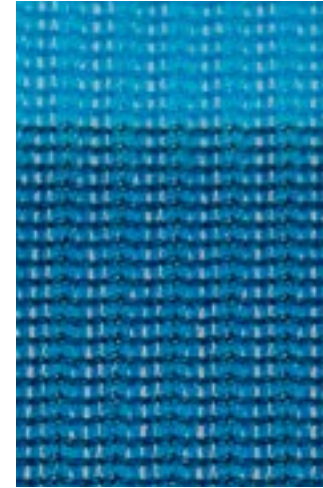


Blue/White

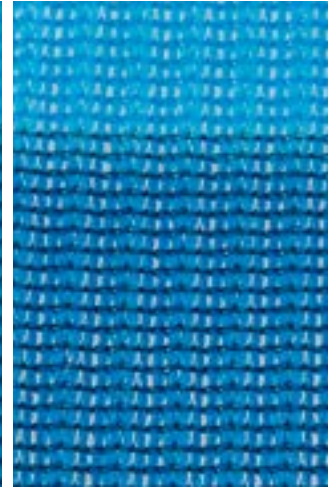


2 Tone Blue

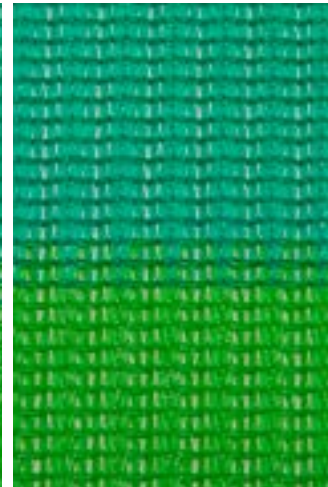
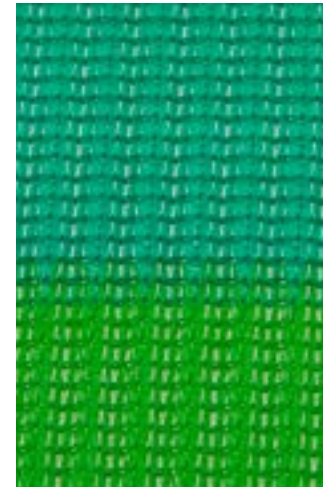
TOP



BOTTOM



2 Tone Green





COLOURSHADE Z25 Standard Range	SHADE FACTOR %	UV BLOCK OUT %
Black	95	96
Bush Khaki	89	93
Charcoal	94	95
Chocolate	92	93
Cinnamon	88	93
Desert Sand	80	92
Navy Blue	90	94
Rain Forest Green	89	96
Red	91	92
Royal Blue	86	94
Rust Gold	90	94
Silver	88	93
Terracotta	84	90
COLOURSHADE Z25 Non-Standard Range		
Acacia	80	95
Arizona	86	91
Atomic Orange	82	94

	SHADE FACTOR %	UV BLOCK OUT %
Electric Purple	84	90
Laguna Blue	92	96
Mulberry	90	91
Olive	93	97
Red Earth	93	97
Sunflower Yellow	70	94
Turquoise	83	92
White	57	86
Zesty Lime	83	92
COLOURSHADE Stripe Range: (New pattern)	SHADE FACTOR %	UV BLOCK OUT %
Beige/Brown	65	90
Blue/White	60	87
Two-Tone Blue	75	83
Two-Tone Green	70	86

Available in:

- 50m rolls and cut lengths

- Standard width: 3m (folded to 1.5m)

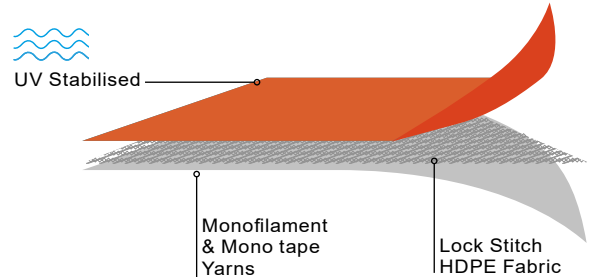
TECHNICAL FEATURES

- Colourshade Z25 is a three bar knitted, lockstitch Z pattern, incorporating one monofilament and two type yarns for dimensional stability, tear and fray resistance.
- The fabric his manufactured at our factory, in South Africa, and is made from virgin High-density polyethylene (HDPE).
- The Z pattern gives excellent weft and warp stability, due to extended throw of the weft yarns across the knitting needles during fabrication of the fabric.
- The Z pattern design achieves high density coverage with the weft yarns, giving up to 97% UV block out and exceptional water run off properties.
- The Z25 fabric is heat set using a stentering process, giving additional dimensional stability and strength as a result of shrinking and equalizing the yarn lengths and knots in the three bar lock-stitch pattern.
- The stentering of the Z25 fabric assists in reducing sagging and looseness in the fabric after installation.
- These fabrics are used extensively for large tension structures, carports, shade sails, awnings and other types of shade covers.



Manufacturers of Knitted Agricultural
and Decorative Shade Net Fabrics

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exports1@multiknit.co.za

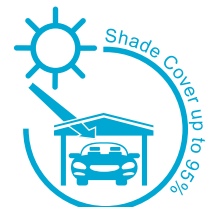


SPECIFICATIONS

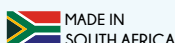
MATERIAL	UV-Stabilised HDPE
CONSTRUCTION	Monofilament and Tape Yarn
PATTERN	Knitted lock-stitch
TEMPERATURE RANGE	-25°C to +80°C
APPROXIMATE THICKNESS	1.7mm
CPI - COURSES PER INCH	12

PERFORMANCE

TENSILE STRENGTH - WARP	720N/50mm (AS 2001.2.3.1-2001)
TENSILE STRENGTH - WEFT	1720N/50mm (AS 2001.2.3.1-2001)
WING TEAR - WARP (mean)	255N (AS 2001.2.10-1986)
WING TEAR - WEFT (mean)	210N (AS 2001.2.10-1986)
TONGUE RIP - WARP	270N (ASTM D2261)
TONGUE RIP - WEFT	185N (ASTM D2261)
WIND TUNNEL TESTS	>200km per hour (performed by CSIR (SA))
PNEUMATIC BURST	420KPa (SANS 1703:2003)
HYDRAULIC BURST	3400KPa (AS 2001.2.4-1990 / ASTM D 3786-06 / ISO 13938-1:1999)
UVR BLOCKOUT %	Up to 97
SHADE COVER %	Up to 95



BASE MATERIALS:



- Virgin HDPE (High Density Polyethylene)
- Stentered Fabrics
- UV (Ultra Violet) stabilizers
- Colourants of high quality refined pigments with high light fastness properties, which provide excellent fade resistant and high tensile strength properties for the individual yarns in the knitted shade net fabric.

TECHNICAL FEATURES



- eXtreme 32 is a three bar knitted, lockstitch pattern, incorporating monofilament and monotype yarns for dimensional stability, tear and fray resistance.
- Our pattern gives excellent weft and warp stability, due to throw of the weft yarns across the knitting needles during fabrication of the fabric.
- The pattern design achieves high density coverage with the weft yarns, giving up to 97% UV block out.
- The eXtreme 32 fabric is heat set using a stentering process, giving additional dimensional stability and strength as a result of shrinking and equalizing the yarns lengths and knots in a three bar lockstitch pattern.
- The stentering of the eXtreme 32 fabric assists in eliminating sagging and looseness in the fabric after installation.
- eXtreme 32 is certified by the Southwest Research Institute Underwriter's Laboratory (UL) as UL 2218 Class 4.



eXtreme 32 Standard Range						Average GSM	Average Warp Break	Average Elongation %	Average Weft Break Strength kg	Average Elongation %	Average Burst KPa	Average Burst to Mass Ratio
	Colour	Width	Length	Shade %	UV Block %							
	Arizona	3m	50m			320	102	65	186	67	398	1.25
	Black	3m	50m	95	96	320	102	65	186	67	398	1.25
	Charcoal	3m	50m	94	96	320	102	65	186	67	398	1.25
	Cinnamon	3m	50m	89	92	320	102	65	186	67	398	1.25
	Desert Sand	3m	50m	91	92	320	102	65	186	67	398	1.25
	Navy Blue	3m	50m	94	95	320	102	65	186	67	398	1.25
	Rain Forest Green	3m	50m	90	92	320	102	65	186	67	398	1.25
	Royal Blue	3m	50m	86	92	320	102	65	186	67	398	1.25
	Silver	3m	50m	91	92	320	102	65	186	67	398	1.25
	Terracotta	3m	50m	93	93	320	102	65	186	67	398	1.25

eXtreme 32 Non-Standard Range						Average GSM	Average Warp Break	Average Elongation %	Average Weft Break Strength kg	Average Elongation %	Average Burst KPa	Average Burst to Mass Ratio
	Colour	Width	Length	Shade %	UV Block %							
	Atomic Orange	3m	50m			320	102	65	186	67	398	1.25
	Bleached Slate	3m	50m	83	97	320	102	65	186	67	398	1.25
	Bush Khaki	3m	50m			320	102	65	186	67	398	1.25
	Chocolate	3m	50m			320	102	65	186	67	398	1.25
	Craft Work	3m	50m	92	96	320	102	65	186	67	398	1.25
	Electric Purple	3m	50m	89	92	320	102	65	186	67	398	1.25
	Laguna Blue	3m	50m	90	91	320	102	65	186	67	398	1.25
	Mulberry	3m	50m	89	84	320	102	65	186	67	398	1.25
	Olive	3m	50m	88	92	320	102	65	186	67	398	1.25
	Red	3m	50m	90	95	320	102	65	186	67	398	1.25
	Rust Gold	3m	50m			320	102	65	186	67	398	1.25
	Sunflower Yellow	3m	50m	80	94	320	102	65	186	67	398	1.25
	Turquoise	3m	50m	92	85	320	102	65	186	67	398	1.25
	White	3m	50m	58	88	320	102	65	186	67	398	1.25
	Zesty lime	3m	50m	85	91	320	102	65	186	67	398	1.25



Easy Care & Maintenance



High UV Protection (up to 97%)



Durability & Longevity



Resilient Dimensional Stability



Extreme Strength



Heat Reduction



High Tear Resistance

eXtreme 32

COLOURSHADE



eXtreme 32 COLOURSHADE fabrics have an ultra high density lockstitch knitted pattern and are heat set for additional dimensional stability. These fabrics are used extensively for large tension structures, carports, shade sails, awnings and other types of shade covers.

		Metric		Imperial
		Fabric Weight		
Strip Test Method	(AS 2001.2.3.1-2001) ASTM D 5035-06 ISO 13934-1:1999	Breaking Force	weft	310-330 gsm 2050-2070N 460-465lbf
			warp	9.2-9.7oz/ft ² 1125-1135N 253-255lbf
		Elongation	weft	46-55%
			warp	46-55%
Grab Method	AS 2001.2.3.2-2001 ASTM D 5034-06 ISO13934-2:1999	Breaking Force	weft	45-54%
			warp	45-54%
		Elongation	weft	1500-1740N 337-391lbf
			warp	700-735N 157-165lbf
Wing-Rip Test Method	AS 2001.2.10-1986	Tear Resistance	weft	23-24%
			warp	21-23%
Tongue Test	ASDM D 2261		weft	205-210N 46-47lbf
			warp	245-255N 55-57lbf
			warp	175-185N 39-42lbf
Hydraulic Burst	AS 2001.2.4-1990 (Method B) ASTM D 3786-06 ISO 13938-1:1999	Burst Strength		255-270N 57-61lbf
Burst Force 25.4 Steel Ball	AS 2001.2.19-1988			3400kPa 493psi
Pneumatic Burst	SANS 1703:2003	(200mm Coaxial Aperture)		1800-2020N 405-454lbf
SABS 1703 Minimum Specified Burst Ratio		(Burst/Mass)		400kPa 58psi
Actual Mean Burst Ratio		(Burst/Mass)		1,20 5.90
Wind Tunnel Test	Conducted by CSIR (SA) (max capability of LSWT)			1,25 6.15
				>200km/h >124mi/h

All specifications have been compiled from results conducted by independent laboratories. The information thereof provided by this company is considered accurate. It also follows strict quality control standards to ensure that these specifications remain consistent and accurate, within a minimal variance. These results should therefore be used as an indication of the specifications of the fabric. By using this product, the user acknowledges that this company cannot be held responsible or liable in any way whatsoever should this information change in any way.

COLOURSHADE



ASTM E84 NFPA 701 UL 2218 (Class: 4)

Multiknit[®]
INTERNATIONAL



ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



DECORATIVE SHADE NETTING

Brought to you by



CHOOSE FROM A VARIETY OF DIFFERENT COLOURS
OUR SHADE NET INCORPORATES A KNITTED LOCK STITCH
WITH A MONOFILAMENT AND TWO TYPE YARNS FOR
DEMINSIONAL STABILITY, TEAR AND FRAY RESISTANCE
Our PATTERN GIVES EXCELLENT WEFT AND WARP STABILITY
PROUDLY MANUFACTURED IN SOUTH AFICA



Since 1964



STANDARD PRODUCT RANGE

ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



STANDARD PRODUCT RANGE



	TOP	BOTTOM
Black		
Bush Khaki		
Charcoal		
Chocolate		
Cinnamon		
Desert Sand		
Navy Blue		



	TOP	BOTTOM
Rain Forest Green		
Red		
Royal Blue		
Rust Gold		
Silver		
Terracotta		



NON-STANDARD PRODUCT RANGE

ASTM E84

NFPA 701

UL 2218 (Class: 4)



MADE IN SA



NON-STANDARD PRODUCT RANGE



	TOP	BOTTOM
Acacia		
Arizona		
Atomic Orange		
Electric Purple		
Laguna Blue		
Mulberry		



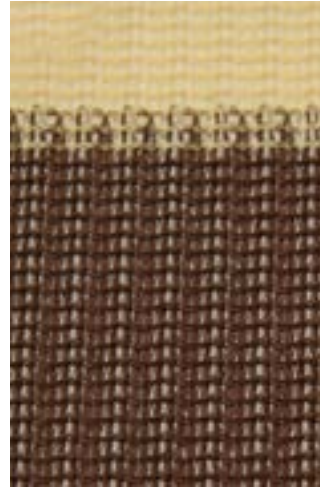
Olive		
Red Earth		
Sunflower Yellow		
Turquoise		
White		
Zesty Lime		

Brown/Beige

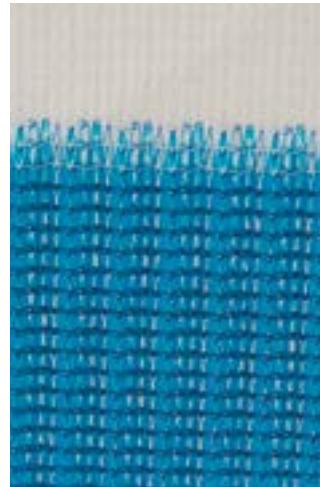
TOP



BOTTOM

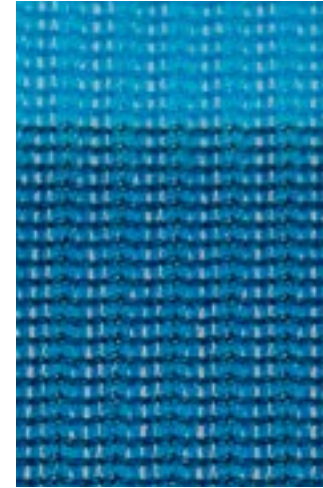


Blue/White

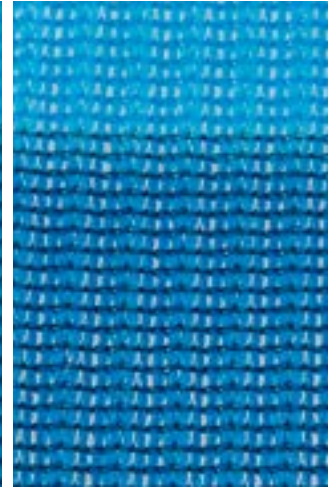


2 Tone Blue

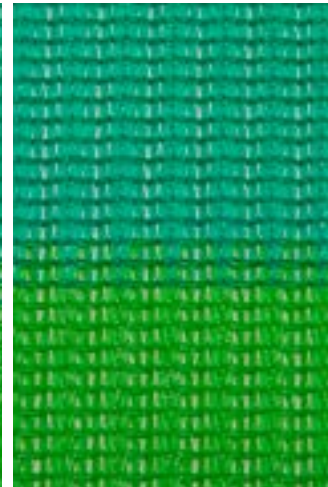
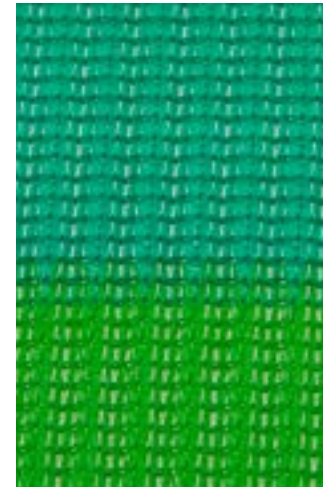
TOP



BOTTOM



2 Tone Green





COLOURSHADE Z25 Standard Range	SHADE FACTOR %	UV BLOCK OUT %
Black	95	96
Bush Khaki	89	93
Charcoal	94	95
Chocolate	92	93
Cinnamon	88	93
Desert Sand	80	92
Navy Blue	90	94
Rain Forest Green	89	96
Red	91	92
Royal Blue	86	94
Rust Gold	90	94
Silver	88	93
Terracotta	84	90
COLOURSHADE Z25 Non-Standard Range		
Acacia	80	95
Arizona	86	91
Atomic Orange	82	94

	SHADE FACTOR %	UV BLOCK OUT %
Electric Purple	84	90
Laguna Blue	92	96
Mulberry	90	91
Olive	93	97
Red Earth	93	97
Sunflower Yellow	70	94
Turquoise	83	92
White	57	86
Zesty Lime	83	92
COLOURSHADE Stripe Range: (New pattern)	SHADE FACTOR %	UV BLOCK OUT %
Beige/Brown	65	90
Blue/White	60	87
Two-Tone Blue	75	83
Two-Tone Green	70	86

Available in:

- 50m rolls and cut lengths

- Standard width: 3m (folded to 1.5m)

TECHNICAL FEATURES

- Colourshade Z25 is a three bar knitted, lockstitch Z pattern, incorporating one monofilament and two type yarns for dimensional stability, tear and fray resistance.
- The fabric his manufactured at our factory, in South Africa, and is made from virgin High-density polyethylene (HDPE).
- The Z pattern gives excellent weft and warp stability, due to extended throw of the weft yarns across the knitting needles during fabrication of the fabric.
- The Z pattern design achieves high density coverage with the weft yarns, giving up to 97% UV block out and exceptional water run off properties.
- The Z25 fabric is heat set using a stentering process, giving additional dimensional stability and strength as a result of shrinking and equalizing the yarn lengths and knots in the three bar lock-stitch pattern.
- The stentering of the Z25 fabric assists in reducing sagging and looseness in the fabric after installation.
- These fabrics are used extensively for large tension structures, carports, shade sails, awnings and other types of shade covers.



Manufacturers of Knitted Agricultural
and Decorative Shade Net Fabrics

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ASTM E-84

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CHEMISTRY AND CHEMICAL ENGINEERING DIVISION

FIRE TECHNOLOGY DEPARTMENT
WWW.FIRE.SWRI.ORG
FAX: (210) 522-3377



STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS PERFORMED IN ACCORDANCE WITH ASTM E84-16

TRADE NAME: Extreme32
MATERIAL ID: *COLOURSHADE EXTREME32*

FINAL REPORT
Consisting of 7 Pages

SwRI® Project No.: 01.22852.01.001a
Test Date: April 27, 2017
Report Date: May 11, 2017

Prepared for:

Multiknit Pty Ltd.
5 Theo Kleynhans Street
White River, Mpumalanga
South Africa

Submitted by:


Eugene F. Horton
Principal Engineering Technologist
Material Flammability Section

Approved by:


Matthew S. Blais, Ph.D.
Director
Fire Technology Department

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Benefiting government, industry and the public through innovative science and technology

Executive Summary

This report presents the test results for a specimen submitted by Multiknit Pty Ltd, located in White River, Mpumalanga, South Africa, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test is conducted in accordance with the procedure outlined in ASTM E84-16, *Standard Test Method for Surface Burning Characteristics of Building Materials* (NFPA 255, ANSI/UL 723 and UBC 8-1).

Marius Nel was retained by SwRI Fire Technology Department's Listing, Labeling, and Follow-Up Inspections Services Section, as a third party inspector, to witness the manufacture of the selected materials at the Multiknit (Pty) Ltd. facility located in White River, Mpumalanga, South Africa, on March 29, 2017. A copy of the surveillance report is on file.

SwRI received a material identified as *Colourshade Extreme32*. This material, provided by Multiknit (Pty) Ltd., is further described in Section 2 of this report. Upon receipt, the inspector's initials were verified to be on the samples. On April 12, 2017, the specimens were prepared and placed in a conditioned environment maintained at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and $50\% \pm 5\%$ relative humidity until prior to testing.

Material ID: *Colourshade Extreme32*

- Flame Spread Index (FSI): 25
- Smoke Developed Index (SDI): 90

Test Criteria.

Classification	Flame Spread Index	Smoke Developed Index
A	0 – 25	0 – 450
B	26 – 75	0 – 450
C	76 – 200	0 – 450

1.0 INTRODUCTION

The purpose of this test method is to determine the relative burning behavior according to the standard ASTM E84 of materials by observing the flame spread along the specimen. Flame Spread and Smoke Developed index are reported in Appendix A. However, there is not necessarily a relationship between these two measurements.

Test specimens are conditioned as appropriate in an atmosphere maintained between 68 and 78 °F and 45 to 55% relative humidity. Immediately prior to the test, the specimen is mounted in the furnace with the side to be tested facing the test flame. Cement board is placed on the unexposed side of the specimen to protect the furnace lid assembly. Sometimes, because of the nature of the material undergoing testing, additional support (e.g. wire, wire and rods, rods, and/or bars) is used to ensure that the specimen will remain in position during the test. The use of supporting materials on the underside of the test specimen may lower the Flame Spread Index from that which might be obtained if the specimen could be tested without such support, and the test results do not necessarily relate to indices obtained by testing materials without such support.

Two model building codes (2015 International Building Code®, Chapter 8 *Interior Finishes*, Section 803 *Wall and Ceiling Finishes*; NFPA 5000, Chapter 10 *Interior Finish*, Section 10.3 *Interior Wall or Ceiling Finish Testing and Classification*) classify materials based on the Flame Spread and Smoke Developed indices.

This standard should be used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions and should not be used to describe or appraise the fire-hazard or fire-risk of materials, products, or assemblies under actual fire conditions. However, results of the test may be used as elements of a fire-hazard assessment or a fire-risk assessment which takes into account all of the factors which are pertinent to an assessment of the fire hazard or fire risk of a particular end use.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials. More detailed results with graphical illustrations may be found in Appendix A.

ASTM E84-16 REPORT

2.0 DESCRIPTION OF SPECIMEN

MATERIAL ID:*	<i>Colourshade Extreme32</i>
TRADE NAME:*	Extreme32
DATE RECEIVED:	April 4, 2017
DESCRIPTION:*	300gsm Knitted HDPE fabric
THICKNESS:	1.3 mm (nominal)
WEIGHT:	2.4 kg (nominal)
COLOR:*	Silver
SUBSTRATE:	N/A
ADHESIVE:	N/A
SPECIMEN SIZE:	7315 × 550 mm (nominal) (one piece)
COMPOSITION:*	100% High Density Polyethylene
PREPARED BY:	SwRI personnel
CONDITIONING TIME:	15 days at 73.4 ± 5 °F, (23 ± 2.8 °C), 50 ± 5% humidity
SUPPORT USED:	2-inch wire mesh with ¼-inch diameter steel rods every 24-inch

* From Client's material description and/or instructions

APPENDIX A
TEST RESULTS
(CONSISTING OF 2 PAGES)

Client: Multiknit Pty Ltd
SwRI Project No.: 01.22852.01.001a
Test Date: April 27, 2017
Material I.D.: *Colourshade Extreme*32

TEST RESULTS

ROUNDED FLAME SPREAD INDEX (FSI):	25
ROUNDED SMOKE DEVELOPED INDEX (SDI):	90

TEST DATA

UNROUNDED FSI:	23.2
UNROUNDED SDI:	87.8
FS*TIME AREA (Ft*Min):	45.0
SMOKE AREA (%*Min):	108.8
FUEL AREA (°F*Min):	889.8

OBSERVATIONS DURING TEST

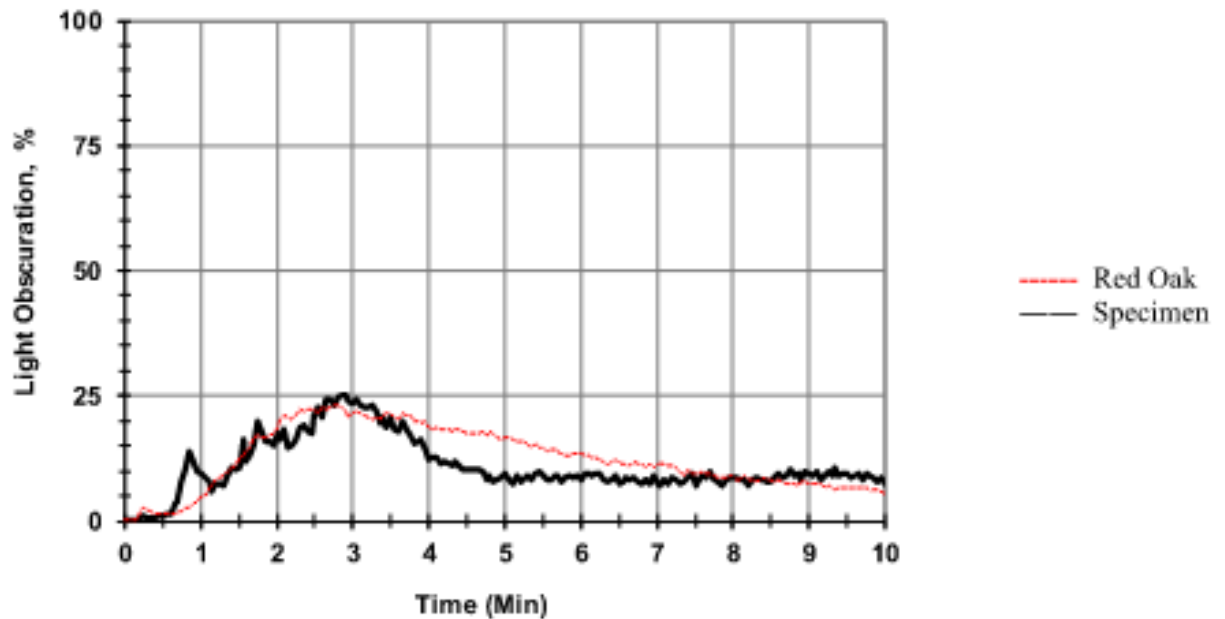
IGNITION TIME (Min: Sec):	00:15
MAXIMUM FLAME FRONT ADVANCE (Ft.):	5.5
TIME TO MAXIMUM ADVANCE (Min: Sec):	2:15
MAXIMUM TEMP. AT EXPOSED TC (°F):	101
TIME TO MAXIMUM TEMP. (Min: Sec):	9:54
TOTAL FUEL BURNED (Cu. Ft.):	52.0
DRIPPING (Min: Sec):	00:30
FLAMING ON FLOOR (Min: Sec):	00:30
AFTERFLAME TOP (Min: Sec):	None
AFTERFLAME FLOOR (Min: Sec):	03:00
SAGGING (Min: Sec):	None
DELAMINATION (Min: Sec):	None
SHRINKAGE (Min: Sec):	None
FALLOUT (Min: Sec):	None

CALIBRATION DATA

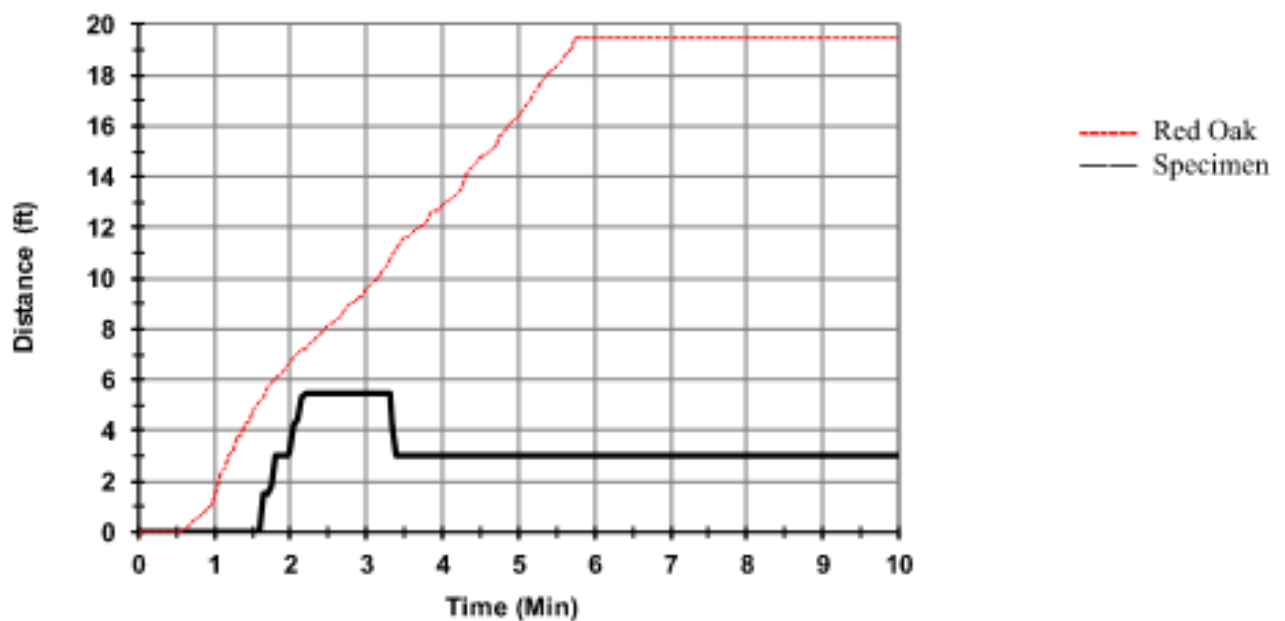
RED OAK SMOKE AREA (%*Min):	118.8
RED OAK FUEL AREA (°F*Min):	6244
GRC BOARD FUEL AREA (°F*Min):	958

Client: Multiknit Pty Ltd
SwRI Project No.: 01.22852.01.001a
Test Date: April 27, 2017
Material I.D.: *Colourshade Extreme32*

LIGHT OBSCURATION



FLAMESPREAD



**USA Headquarters**

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2580 Esters Blvd., Suite 100
DFW Airport, TX 75261
FedEx and UPS Shipments

Mailing Address

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NFPA 701

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WWW.FIRE.SWRI.ORG
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NFPA 701-2015, STANDARD METHODS OF FIRE TESTS FOR FLAME PROPAGATION OF TEXTILES AND FILMS (TEST METHOD 2)

MATERIAL ID: *eXtreme 32 / HailShield*
TRADE NAME: eXtreme 32 HDPE Fabric

FINAL REPORT
Consisting of 4 Pages

SwRI Project No: 01.21604.16.348f
Test Date: October 6, 2016
Report Date: October 17, 2016

Prepared for:

Shade Structures, Inc. dba USA Shade & Fabric Structures
8505 Chancellor Row
Dallas, Texas 75247

Prepared by:


Eugene F. Horton
Principal Engineering Technologist
Material Flammability Section

Approved by:


Matthew S. Blais, Ph.D.
Director
Fire Technology Department

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1.0 INTRODUCTION

This report presents the results of a specimen submitted by the Client, and tested at Southwest Research Institute's (SwRI's) Fire Technology Department, located in San Antonio, Texas. The test was conducted in accordance with the procedures outlined in NFPA 701, 2015 Edition, *Standard Methods of Fire Tests for Flame Propagation of Textiles and Films* (Test Method 2).

This method is intended for use in determining the resistance of fabrics and films to propagation of flame beyond the area exposed to the source of ignition. This method shall apply to single-layer fabric and multilayer curtain and drapery assemblies while suspended in a vertical configuration. However, where durability to cleaning or weathering is claimed, the fabric or material shall be tested for flame resistance as produced and after being subjected to the applicable cleaning or laundering procedure. The results of this test do not necessarily indicate whether the material tested will resist the propagation of flame under severe exposure or when used in a manner that differs substantially from the test conditions.

Ten individual test specimens shall be cut from a single piece of the material to be evaluated: 125 × 1200 mm (4.90 × 47.25 in.) for flat strips, and 610 × 1200 mm (24 × 47.25 in.) for folds, with the length parallel to the lengthwise direction of the material. Only specimens that cannot be folded shall be tested in the flat configuration.

Each specimen shall be conditioned in an oven at a temperature of 105 °C ± 3 °C for not less than 1 h, and no more than 3 h before testing.

Each specimen is mounted on the support hanger in the test cabinet. The burner is placed 100 mm (3.94 in.) away from the specimen with the center axis of the burner at a 25-degree angle in line with the bottom of the center of the specimen, and is maintained for a 120 s exposure time.

The afterflame time of the specimen (time of burning of the specimen after the gas flow is turned off) and the time of burning of material that falls to the bottom of the chamber shall be measured and recorded.

The requirements for acceptance of the NFPA 701 (Test Method 2) are:

1. Where fragments or residues of specimens that fall to the floor of the test chamber continue to burn for more than 2 s, the material shall be recorded as failing the test.
2. Where the char length exceeds 435 mm (17.1 in.) for flat specimens or 1050 mm (41.3 in.) for fold specimens, the material shall be recorded as failing the test.
3. Where the afterflame exceeds 2 s, the material shall be recorded as failing the test.

4. Where the specimens do not demonstrate performance in accordance with any of the conditions indicated in the above, the material shall be recorded as passing the test and shall be designated as flame resistant.

The results apply specifically to the specimens tested, in the manner tested, and not to the entire production of these or similar materials, nor to the performance when used in combination with other materials.

This standard should be used to measure and describe the properties of materials, products, or assemblies in response to heat and flame under controlled laboratory conditions and should not be used to describe or appraise the fire hazard or fire risk of materials, products, or assemblies under actual fire conditions. However, results of this test may be used as elements of a fire risk assessment, which takes into account all of the factors, which are pertinent to an assessment of the fire hazard of a particular end use.

NFPA 701 TEST REPORT (TEST METHOD 2)

2.0 MATERIAL DESCRIPTION

Material ID	Description	Trade Name	Color	Mass*	Received Nominal Dimensions*
<i>eXtreme 32 / HailShield</i>	Shade cloth for fabric structures	eXtreme HDPE Fabric	Grey	2328 g	1200 × 610 × 1.45 mm

* Measured by SwRI personnel.

Preparation: The specimens were received on September 12, 2016, prepared according to standard NFPA 701, Method 2, and placed in a controlled environment maintained at 23 °C ± 3 °C at 50% ± 5% relative humidity on September 15, 2016. On October 6, 2016, the specimens were then placed in an oven at 105 °C for 1-3 h before testing. The specimens were then removed from the conditioning chamber, secured into the test chamber, and tested.

3.0 TEST DATA

TEST DATE: October 6, 2016

Specimen No.	Char Length (mm)	Afterflame Time (s)	Burning on Floor (s)	Pass/Fail
1	127	0	0	Pass
2	168	0	0	Pass
3	141	0	0	Pass
4	153	0	0	Pass
5	166	0	0	Pass
6	148	0	0	Pass
7	138	0	0	Pass
8	124	0	0	Pass
9	192	0	0	Pass
10	176	0	0	Pass

Observations: None

4.0 CONCLUSIONS

Based on the test results and the classification criteria, the specimen identified as *eXtreme 32 / HailShield* **meets** the requirements established under the NFPA 701 (Test Method 2).

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