

GATORSHIELD®

Steel Tubing vs. Aluminum



 **allied**
TUBE & CONDUIT
MECHANICAL TUBE
DIVISION

A **tyco** INTERNATIONAL LTD. COMPANY

THE ENGINEERED CHOICE FOR OUTDOOR STRUCTURES

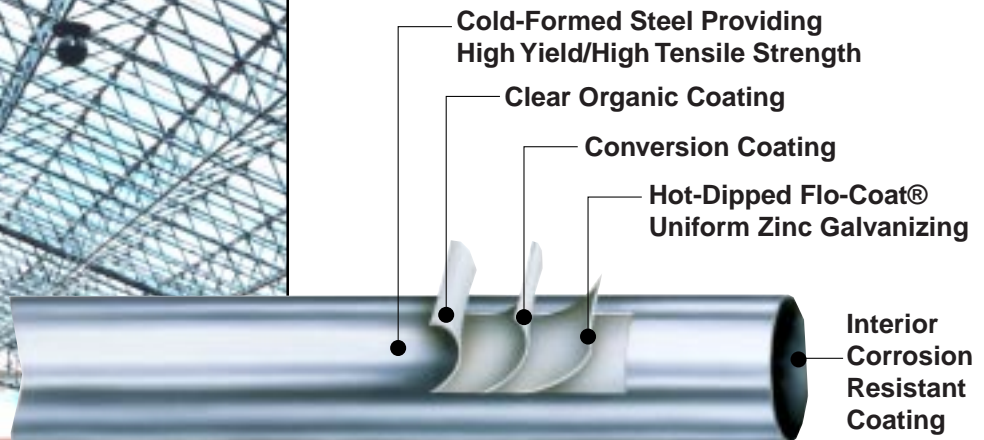
GATORSHIELD ADVANTAGES...

...ARE MORE THAN SKIN DEEP

Gatorshield® is Allied's superior, triple-layer rust and corrosion resistant product protection, used exclusively for all 50/55®, 60/75®, and RS 20 and RS 40 structural steel tubing. Gatorshield coated steel tubing has been the standard of excellence and the product of choice for outdoor structures for over 15 years.

Gatorshield tubing is given superior corrosion resistance by our patented, in-line Flo-Coat® process. Coatings of zinc and chromate are applied, then a clear polymer top-coat seals the surface. The result is unmatched, long-lasting rust and corrosion protection.

Gatorshield's bright, smooth and uniform surface retains its attractive appearance for an extended period. Aluminum turns a dull, dark gray as it ages.



...CAN MAKE STRUCTURES 60% LESS COSTLY

Gatorshield's advantages over aluminum add up. Lower material cost, less material required per structure, and less fabrication expense add up to a compelling cost argument in favor of Gatorshield tubing as the material of choice for outdoor structures. And the much reduced risk of post-installation failure due to welding and wind, snow or ice loading is Gatorshield's "insurance policy" against expensive repair or replacement in the future. Also, the use of steel reduces theft and vandalism of structures... the scrap value of aluminum is more than 10 times that of steel.

Satisfied users agree on Gatorshield's cost effectiveness. And on its superiority.

GATORSHIELD ADVANTAGE... UNMATCHED DURABILITY

The higher rigidity of Gatorshield structures means less bowing and deflection than aluminum structures under identical load conditions. This translates to a much more stable installation, with far less chance of damage to the fabric covers, graphics and back-lit illumination equipment of custom awnings and the roofs of structures. Gatorshield's superior hardness

makes framing and support structures much more resistant to everyday dings and dents. And its approximately 30% greater load carrying capacity than aluminum, size for size, is dramatically revealed as a Gatorshield advantage in the test below which was conducted by Construction Research Laboratory, Inc. of Miami, an independent testing laboratory.

WIND LOAD COMPARISON

Both test awnings were 15'0" wide by 36" high by 8'0" deep and identically attached to a supporting back wall structure. One awning frame was fabricated of Gatorshield 1.050" OD by 14 gauge and 0.815" OD by 15 gauge welded steel tubing; the other from

Schedule 40 1.050" OD by 12 gauge and 0.840" OD by 12 gauge 6061-T6 extruded aluminum pipe. Identical awning material was used for each. And each awning was subjected to wind speeds increased in 10 mph increments.

ALLIED GATORSHIELD® WIND SPEED

Fabric cover flutters inwind; very slight frame flutter.

**50
MPH**



Moderate fluttering of cover; still only slight frame vibration.

**60
MPH**



Increased cover fluttering; moderate frame oscillation.

**70
MPH**



Violent fluttering of cover, eave framing bows downward about six inches at center. Post-test inspection revealed slight permanent downward bow in center of eave and at center of intermediate rafters. No failures evident.

**80
MPH**



ALUMINUM PIPE/WIND SPEED



**50
MPH**

Moderate fluttering of fabric cover; pronounced lateral movement of frame.



**60
MPH**

Entire structure collapses in 4 seconds. Post test inspection disclosed complete failure of horizontal struts by buckling.

CONCLUSION

For durability and installation stability, Allied's Gatorshield® steel tubing is far superior to aluminum for all awning and canopy frame applications. Full test information is available upon request.

**GATORSHIELD ADVANTAGES MAKE IT THE
STRUCTURAL TUBING OF CHOICE**

GATORSHIELD ADVANTAGE... GREATER STRENGTH

Gatorshield's superior strength is the key to its advantage over aluminum, yielding greater structural integrity and requiring fewer linear feet of material per structure. In turn, these advantages translate into longer life and lower costs for outdoor structures.



PROPERTY	50/55 w/GATORSHIELD	ALUMINUM
Yield Strength	50,000 PSI Min.	25,000 PSI
Tensile Strength	55,000 PSI Min.	30,000 PSI
% Elongation	25% Min.	15% Min.
Modulus of Elasticity	30 x 10 ⁶ PSI	10 x 10 ⁶ PSI
Typical Surface Hardness – Rockwell B	75	35 - 40

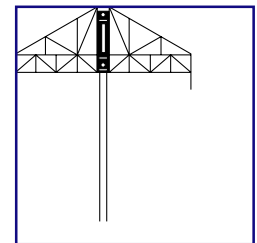
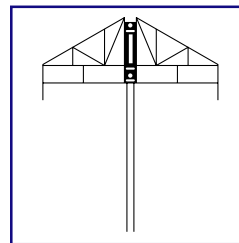
You'll Need Less Gatorshield

Gatorshield's higher strength permits the use of smaller sizes and/or lighter walls to achieve the desired design performance. The design comparison below demonstrates that less Gatorshield tubing is required than aluminum for any given outdoor structure. Less material and Gatorshield's lower material cost (approximately 50% savings vs aluminum) give Gatorshield a compelling advantage over aluminum.

Comparison – Material and Welding

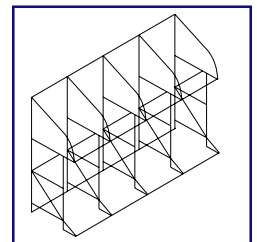
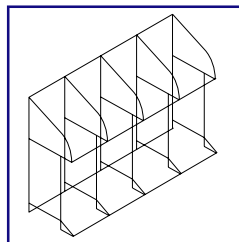
Domed Umbrella	GATORSHIELD	ALUMINUM
Material Required	768 Lin. Ft.	1,328 Lin. Ft.
Total Weld Count	112	395

Gatorshield
42% Less Material!
72% Fewer Welds!



7' Typical Radius	GATORSHIELD	ALUMINUM
Material Required	768 Lin. Ft.	1,328 Lin. Ft.
Total Weld Count	112	395

Gatorshield
31% Less Material!
42% Fewer Welds!



Comparable Strength

- Gatorshield permits substitution of lighter gauge, less costly steel in place of heavier gauge aluminum with no loss in strength.
- Gatorshield also allows up to 22% reduction in outside diameter when compared to same gauge aluminum without sacrificing strength.

ALUMINUM SIZE	GATORSHIELD SIZE
1.00 sq. x .125 (11 ga.)	1.00 sq. x .035 (20 ga.)
1.00 x 2.00 x .125 (11 ga.)	1.00 x 2.00 x .035 to .065 (20 ga. to 16 ga.)
1.315 x .083 (14 ga.)	1.050 x .083 (14 ga.)
1.660 x .083 (14 ga.)	1.315 x .083 (14 ga.)
1.900 x .095 (13 ga.)	1.660 x .095 (14 ga.)

GATORSHIELD ADVANTAGE... SUPERIOR FABRICATION

A comparison of the requirements for fabricating outdoor structures of Gatorshield and aluminum reveal major advantages for Gatorshield:

- Gatorshield ductile steel tubing withstands the bending and forming required for custom awning designs, recreational equipment, etc.. Common tempers of aluminum, however, continue to age-harden while in storage, and can break during any fabrication process, causing costly scrap losses.
- Aluminum loses approximately 50% of its strength in the weld area, which could cause post-installation failure if welds are not located in low stress areas during its design. In addition, welding of aluminum, or using aluminum electrodes which contain magnesium, can result in unsightly black deposits.
- Steel structures require significantly fewer welds as indicated in comparison on the previous page. The result is lower welding labor costs for Gatorshield structures. Welding Gatorshield also requires less expensive equipment and materials. And, unlike aluminum, Gatorshield can be easily welded in the field.
- Gatorshield steel tubing is easily and less expensively painted or powder coated than aluminum, offering variety in color, texture and sheen to enhance design possibilities and aesthetic appeal. Because Gatorshield's third coat has the same paint chemistry and surface consistency as costly primers, finish adhesion is excellent, providing a long-lasting, attractive appearance.

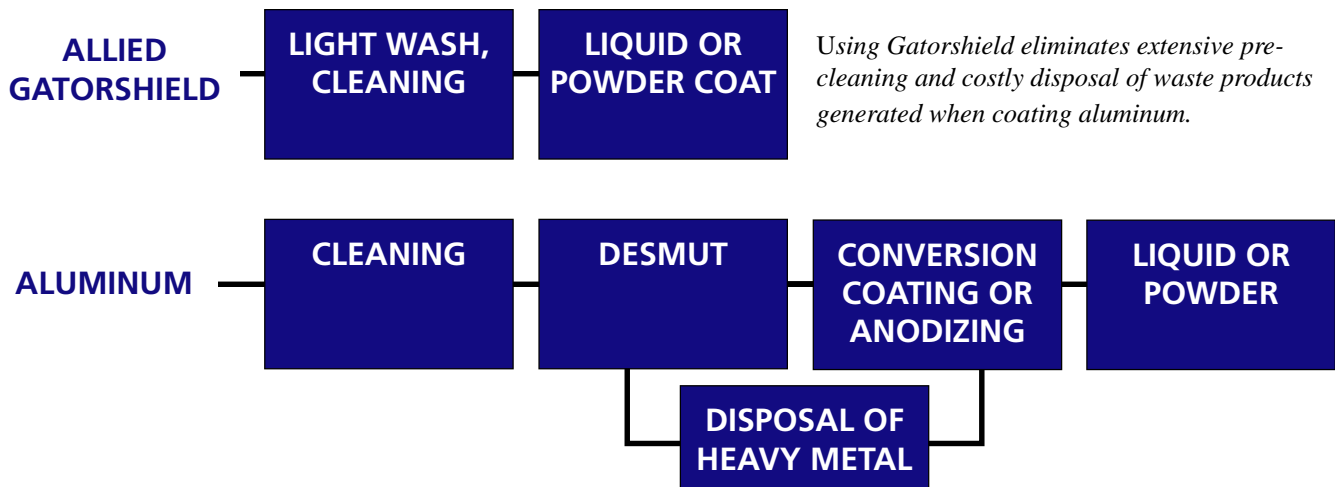


Section Properties – Allied's Gatorshield

EQUIV. PIPE SIZE	SIZE	A	I	SM	R	LBS/FT
½"	.815 x .072	.168	.0117	.0287	.263	.571
¾"	1.050 x .083	.252	.0296	.0565	.343	.857
1"	1.315 x .083	.321	.0612	.0931	.436	1.092
1¼"	1.660 x .083	.411	.1281	.1544	.558	1.397
1½"	1.900 x .095	.538	.2199	.2315	.639	1.831
2"	2.375 X .095	.680	.4429	.3729	.806	2.313

A = Cross-sectional Area (inches²) Assists in determining size, once load demand is known.
 I = Moment of Inertia (inches⁴) Measure of a tube's resistance to deflection under load.
 SM = Section Modulus (inches³) The key ingredient to determining load-carrying capabilities.
 R = Radius of Gyration (inches) The critical factor for determining buckling loads of a column.

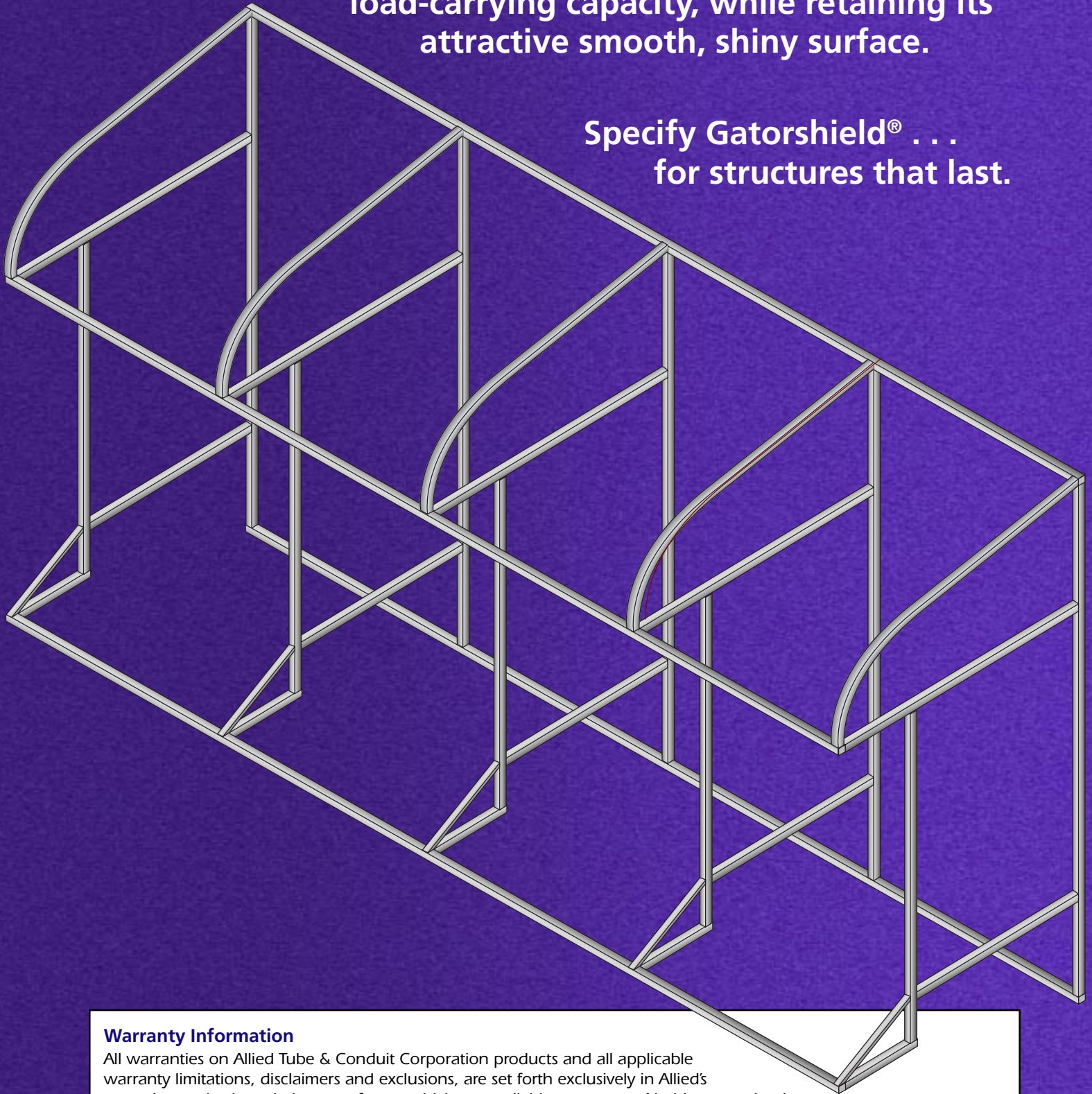
Coating Process Comparison



Using Gatorshield eliminates extensive pre-cleaning and costly disposal of waste products generated when coating aluminum.

For all your structural applications, Gatorshield® galvanized steel tubing outperforms aluminum. Gatorshield is stronger, costs less, fabricates more easily, and has greater load-carrying capacity, while retaining its attractive smooth, shiny surface.

Specify Gatorshield® . . .
for structures that last.



Warranty Information

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