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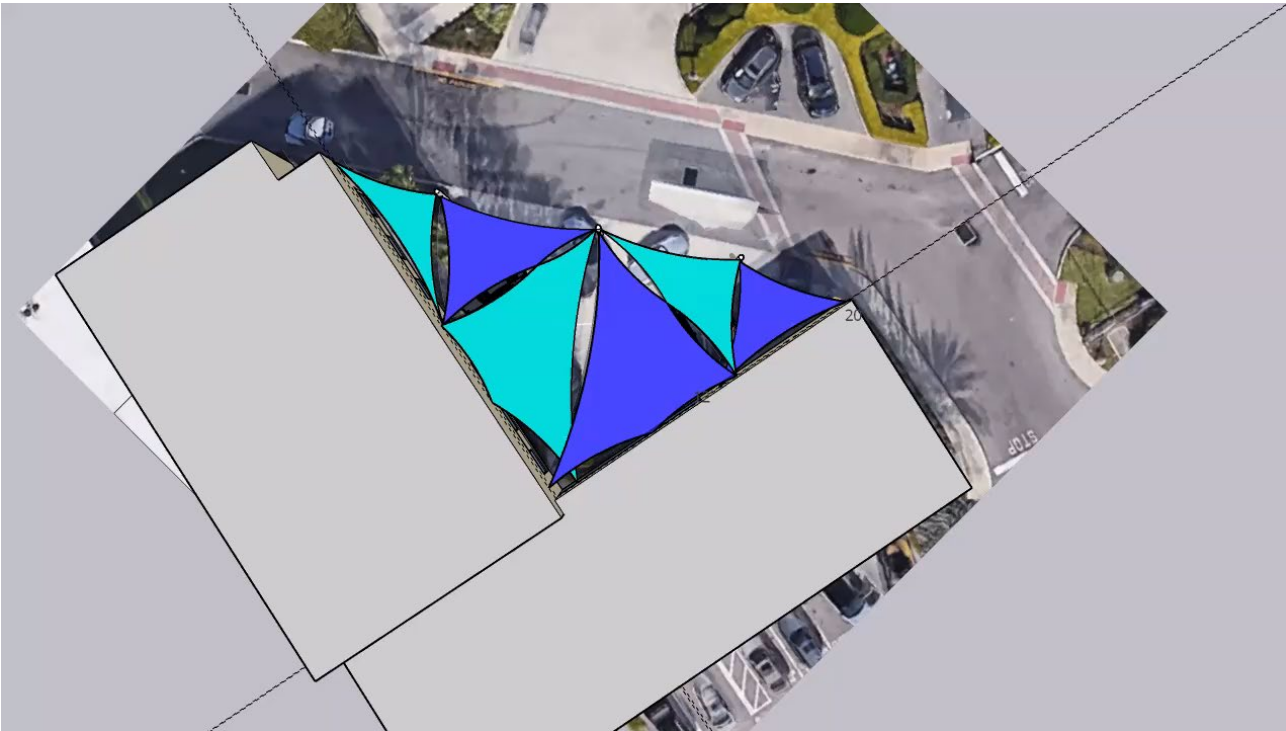
# Shade Sail Theory 101

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Advanced Textiles  
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# What makes a (perfect) shade sail?



How do I make the right compromises to achieve the best results?

How do I design a shade sail that makes my customers AND my installers happy?

# The Perfect Shade Sail

Looks Great

Goes up the first time with no issues

Lasts throughout the warranty period

**How do I do that?**



# The Perfect Shade Sail

- **4-Sided Hypar Shape**, 2 high and 2 low points
- **Turnbuckles** at each corner
- **7% Edge Curve**
- Sail corners **anchor to the attachment point** without extension

Anything else is a compromise that requires special handling.



# Why does it need a Hypar twist?

The Hypar twist provides tension throughout the sail by putting opposite pulling forces on the fabric (up and down).

A Hypar also incorporates “shape” into the fabric that is impossible to do with a triangle.

A tight sail is a happy sail.



# Hypar Compromises



- If it must be a triangle – the longest side can't be more than double the length of the shortest side.
- If it must be a triangle – Add a kiss point to close the gap between two triangles and provide more shade.
- If it must be a triangle – Convince your customer to use a Hypar sail to do the work of providing shade and adding an accent triangle for appearance.
- If it must be flat (you have 4 or more corners, but you don't have height options) - then you should increase the edge curve to 10% so that the flat fabric doesn't sag.

# Why do I need a turnbuckle at each corner?

By having an adjustable turnbuckle at each corner, you get more margin for error.

You can overcome measurements that are slightly off, you can adjust the position of the sail moving the whole thing a few inches here or there, and it makes the sail easier to take down and put back up, for example – to paint the building or prepare for a hurricane.



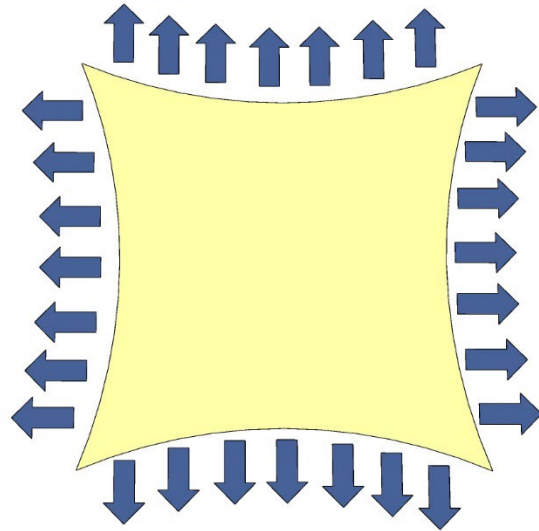
# Turnbuckle Compromises



- Triangles – At least one corner has a turnbuckle
- 4 or more corners – At least 2 corners have turnbuckles
- If you can only use one turnbuckle, make it a big one for more adjustability and make triple sure your site measurements are correct.
- If your design include a keder edge, make sure the other corners all have turnbuckles.
- If your customer doesn't want any turnbuckles, it must be a small sail, no more than 12-14' on any side and your measurements and attachment point integrity must be perfect.

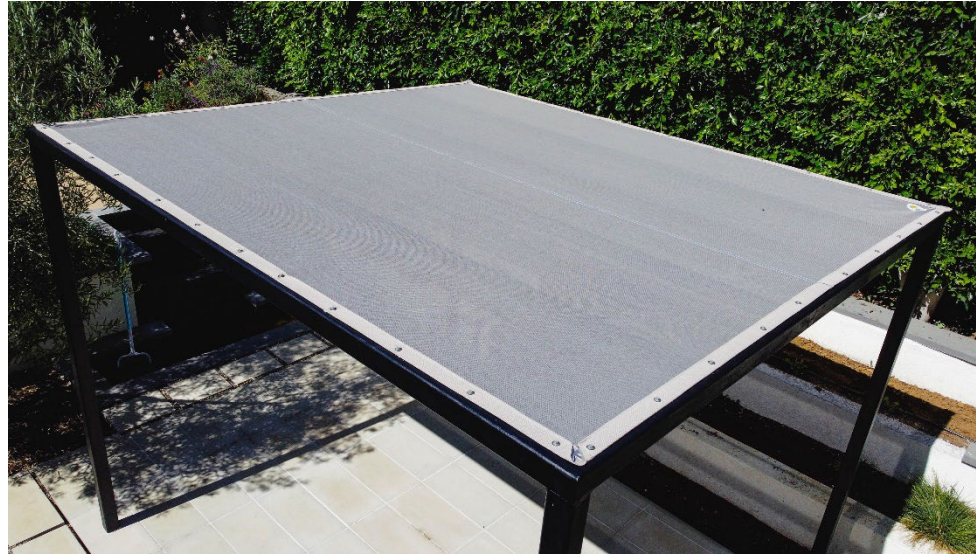
# Why do the edges need a 7% curve?

Starting with the curve allows the fabric some room to stretch during the installation. The cable will then hold the tension and distribute it throughout the sail – reducing the tension on the corners.

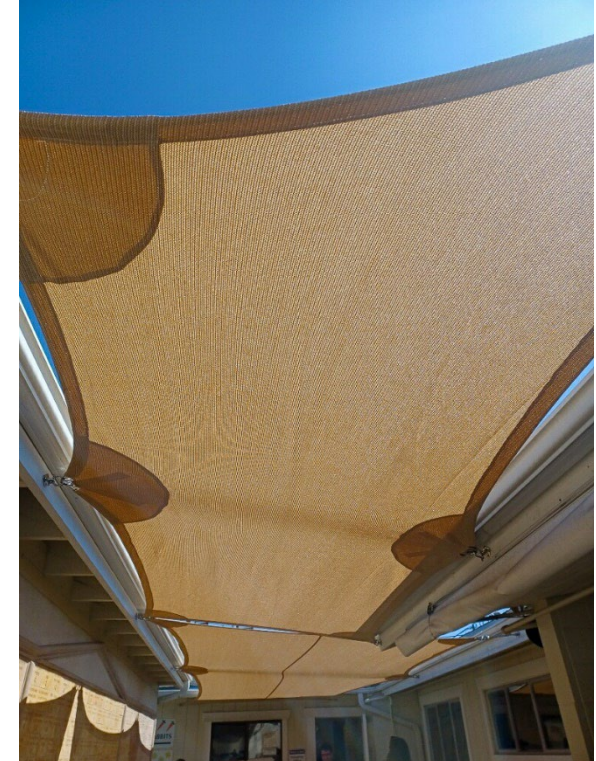


With a **hypar twist** and **curved edges with cable**, your sail has forces pulling on it in all directions.

# Edge Curve Compromises



- If you must have a straight edge, for example when you can't have any sun getting through the gap, consider a different style for that edge.
  - Keder
  - Invisible Frame
  - Lace On
  - Additional attachment points along the edge
- If you need more than 7%, for example to clear an obstacle, make sure to take measurements to the obstacle to ensure proper clearance.



# Why do I want to avoid extensions?

When a shade sail is designed to go all the way to the attachment point, it looks better (like it was planned that way) and reduces flutter during high winds which can shorten the life of the sail.



# Connection Compromises



- If you must have an extension cable:
  - Keep it as short as possible
  - Make sure you design it to pull along the proper angle
- NEVER stack 2 turnbuckles or shackles back-to-back. If you find that you need extra length, create a short run of cable or bump up to the next size hardware.

How do I design a shade sail that makes  
my customers AND my installers  
happy?

# Designing a Shade Sail for a Happy Customer!

Customers have preconceived notions about what shade sails should be, it's your job to educate them, list all the pros and cons of what they are asking for and sell them on the design that meets their needs and is still a good shade sail.

“But it really needs to be flat” – “Ok, but if we go with a flat sail, it will sag and move around in a storm.”

“I need this long and skinny triangle” – “I hear your concern, but a long skinny triangle is only for looks and won't provide any shade.”

“I know your main goal is to shade your new table and chairs set on your new deck. My proposal includes a 4-corner shade sail that we will put a dramatic twist in. This will get you that triangle look that you like, but also provide you with complete shade coverage over the table. For a little extra style and some more shade, we can add an accent triangle sail by sharing these two posts...”

**It's all about managing Customer Expectations.**



# Designing a Shade Sail for a **Happy Customer** **AND** a Happy Installer!



Your installers will struggle if the shade sail isn't designed well.

A Good Shade Sail Design will be easier to pull (curves) and easier to tension (turnbuckles) and will look better once it's up (twist, no sag).

Remember, your installers are the first ones to hear about whether your customer is happy with their new shade sail.

# The Perfect Shade Sail

Looks Great (**Happy Customer**)

Goes up the first time with no issues (**Happy Installer**)

Lasts throughout the warranty period (**Happy Owner**)



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