University of Southern Queensland

Advanced Manufacturing and Glass

Technical Braiding

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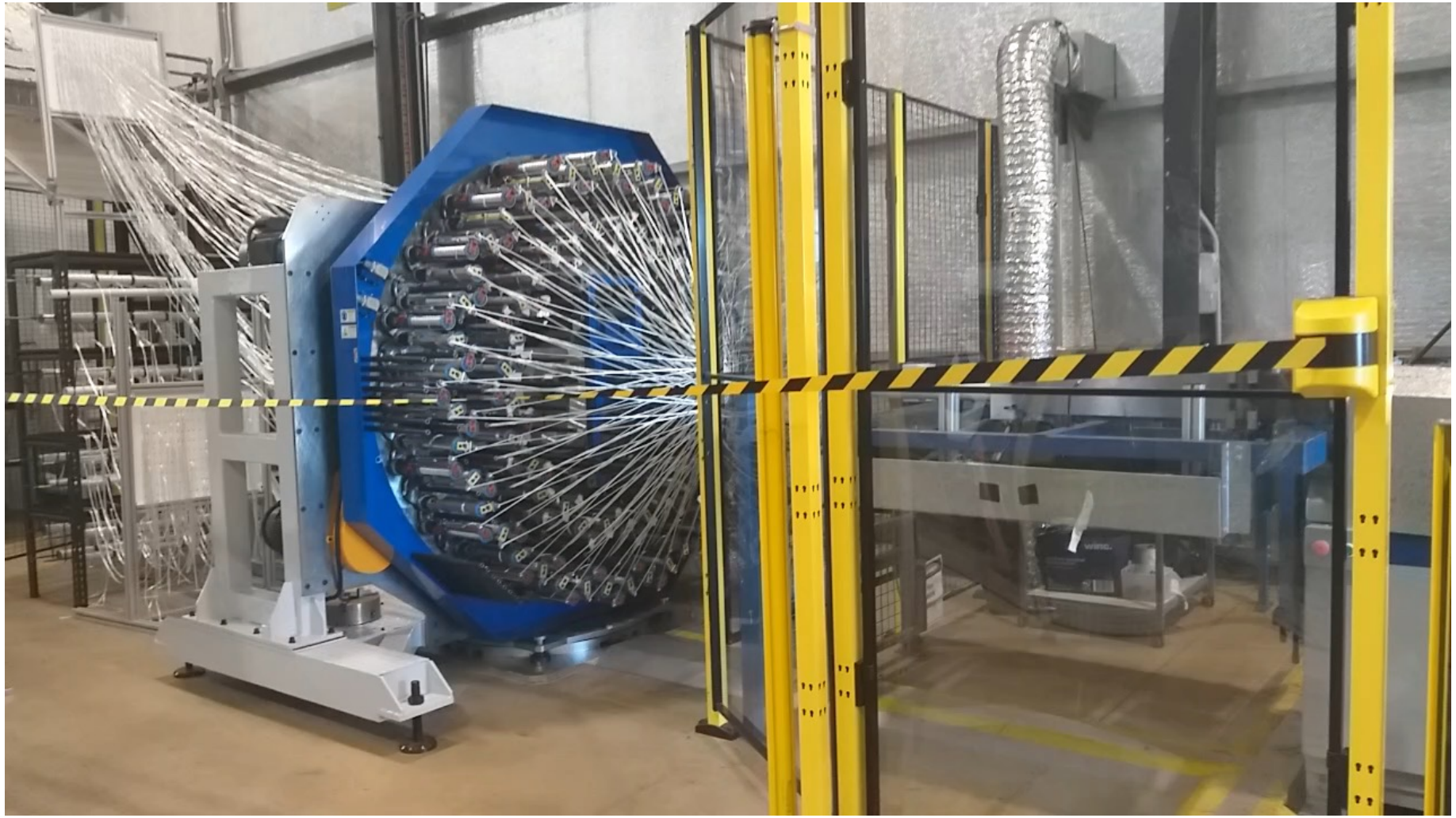
Acknowledgement of Country

UniSQ acknowledges the traditional owners of the land on which we gather.
We pay our respect to Elders – past, present, and emerging.

Full scale braider in action in UniSQ laboratories

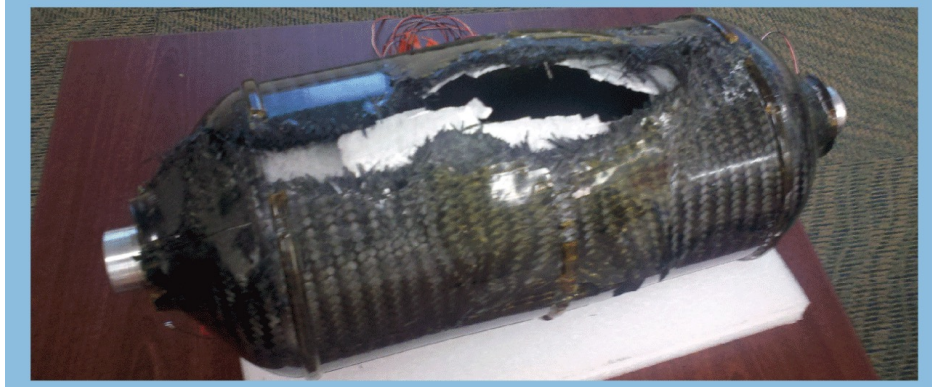


Up to 144 fibres / strands!

Why do we braid fibres?

- To increase strength compared to single fibres
- To create structures for specific applications requiring high strength and to potentially withstand high pressure and high temperature.
- Flat, tubular and solid products may be developed in this process.
- Advanced preforms can be produced

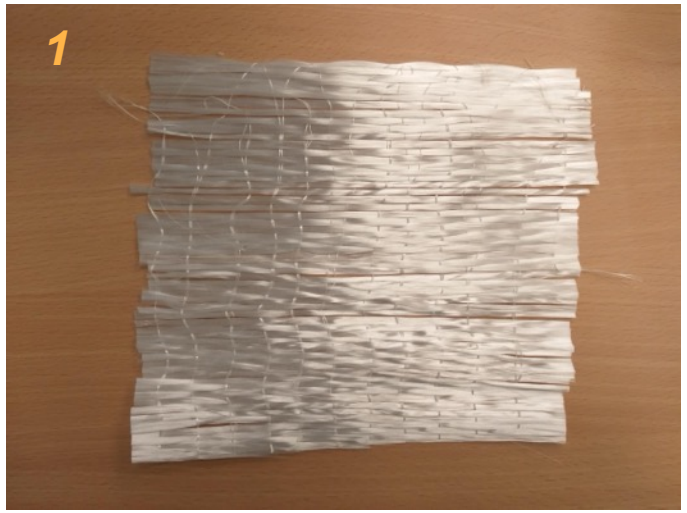
Braided Tank After Burst Test



Filament Wound Tank After Burst Test

https://www.braider.com/Case-Studies/High-Pressure-CNG--and--Hydrogen-Tanks.aspx

Which of these samples are glass? Which are not glass?



Small scale braiding

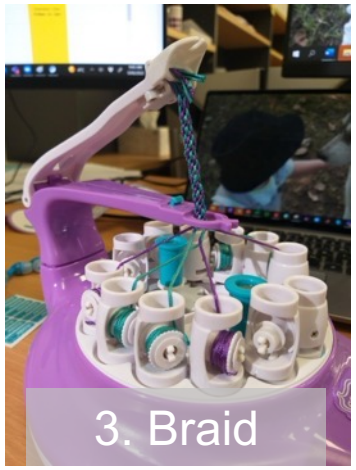
These may seem like toys (which they are!) but they are useful for small scale lab samples.

One of our researchers will trial using them to form small scale carbon fibre braids.

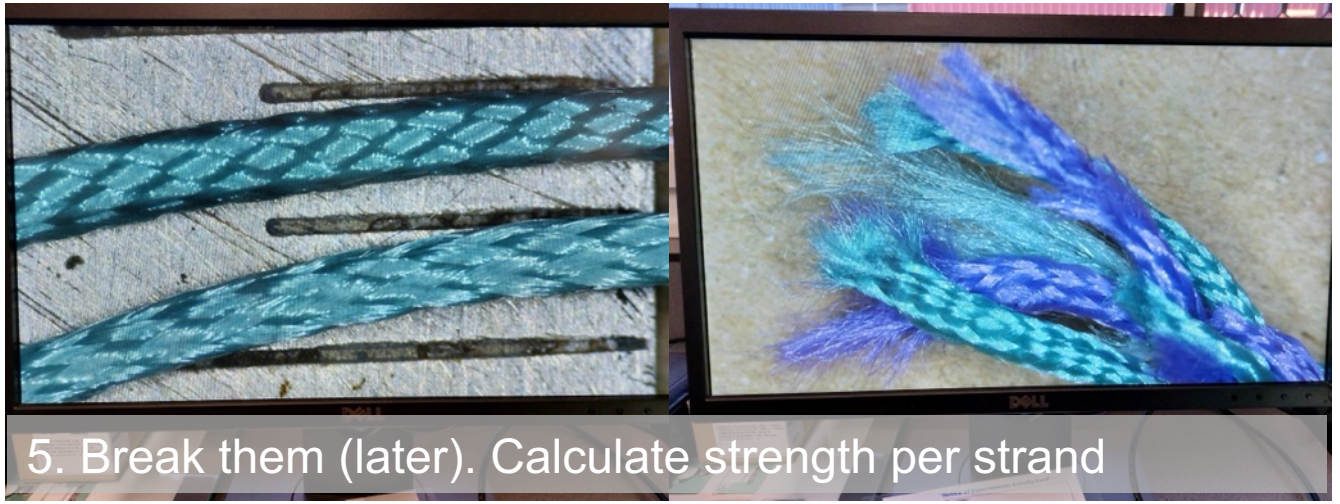
How to?


1. Align the braider


2. Load the bobbins


3. Braid


4. Secure the ends


5. Break them (later). Calculate strength per strand

https://twitter.com/DrPollyBurey/status/1534857383696277504

How strong?

How strong is one strand?

a) 50 Newtons
b) 100 Newtons
c) 130 Newtons
d) 180 Newton

How strong is one 8-strand braid?

a) 400 Newtons
b) 600 Newtons
c) 800 Newtons
d) 1000 Newtons

How strong? Our lab tests

- One ‘strand’ from the bobbin breaks at about 130 N
- We tested an 8 strand braid and it broke at about 800 N
- **What is the strength per strand?**
- **Can we just multiply the strength of one strand to get braid strength?**

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