



## Ultrablade™ triaxial fabric solutions





Owens Corning is the leader in glass science responsible for innovations in glass including E, Advantex® brand and high performance glass over a period of more than 70 years.

Our expertise in chemistry enables leading solutions in every product form from continuous roving to non-woven glass chemistry.

Our state of the art facilities allow us to work in partnership with our customers to develop fabric solutions for specific applications.

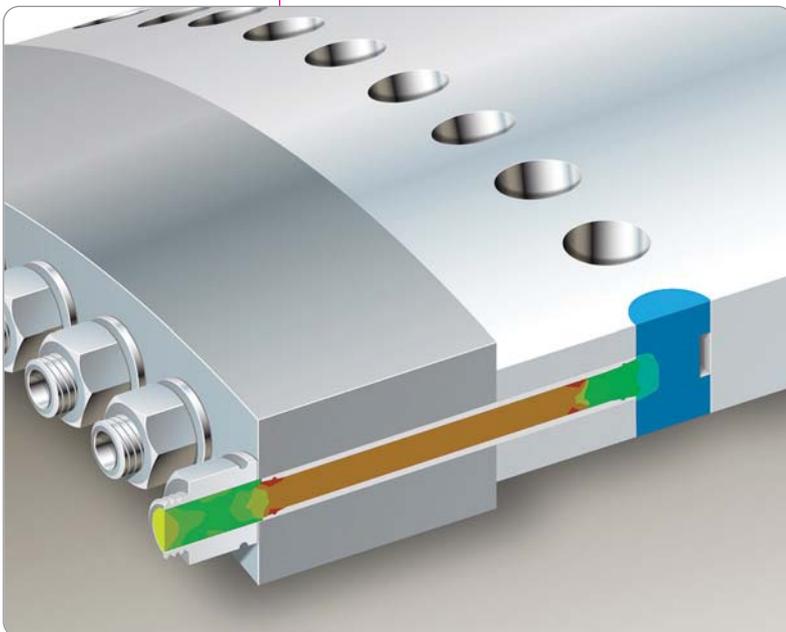
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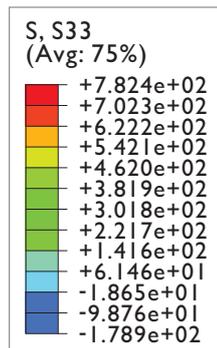
**Ultrablade™ triaxial fabrics enable smaller root diameter and blade length extension\***



Increases blade root laminate stiffness and strength

Reduces the loading transferred to bolt ( $F_b^1 < F_b^2$  as shown in the sketch opposite)

Substantially improves the bolt fatigue life with the reduced bolt loading



\*Patent pending

## Ultrablade™ triaxial product range

| Ultrablade™ triaxial                                 | Type     | Application  |
|--|----------|--------------|
| Ultrablade™ TLX 800-2000<br>Ultrablade™ TTX 800-2000 | Triaxial | Root section |

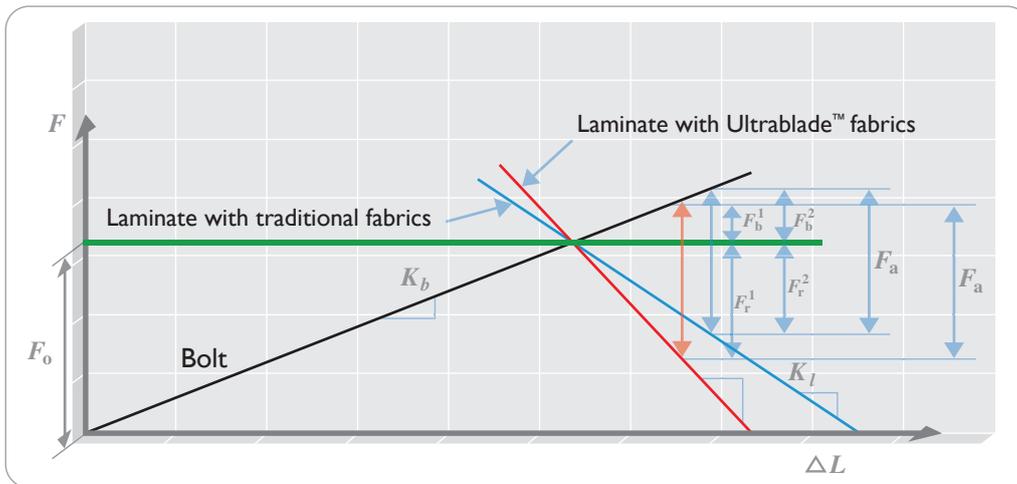
## Static property of TTX1500 (as an example)

Laminate fabricated with RIMR035c/RIMH037, testing conducted by Momentive Specialty Chemicals Stuttgart GmbH.

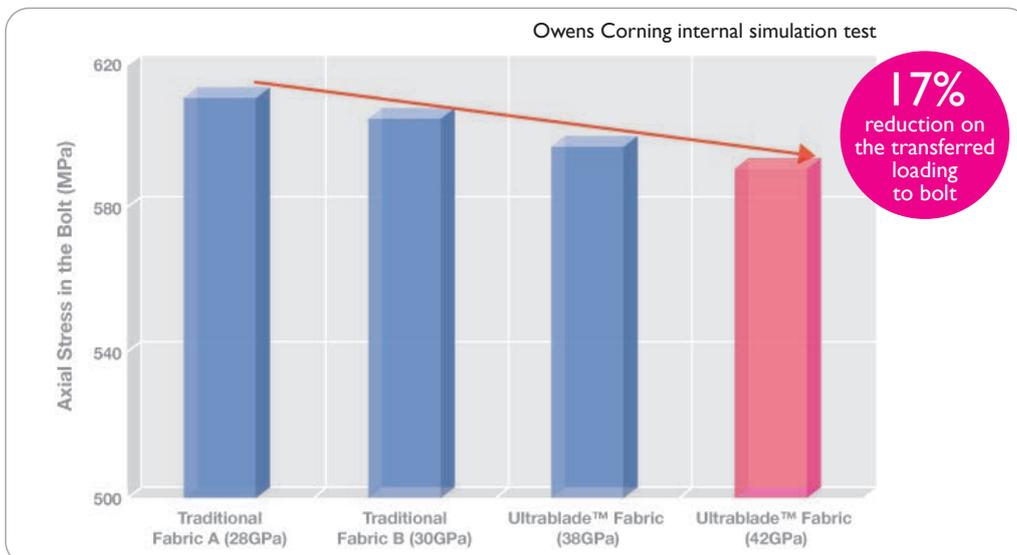
| Test      | Modulus | [GPa] | Mean strength [MPa] | Characteristic Strength [MPa] | Elongation [%] | FWF [%] |
|-----------|---------|-------|---------------------|-------------------------------|----------------|---------|
| ISO 527-4 | Et1     | 41.10 | 830.00              | 770.00                        | 2.23           | 74.60   |
| ISO 14126 | Ec1     | 39.60 | 616.00              | 509.00                        | 1.58           | 72.50   |
| ISO 527-4 | Et2     | 12.90 | 53.80               | 46.90                         | 0.71           | 72.90   |
| ISO 14129 | G12     | 5.0   | 26.90               | 23.60                         |                | 72.90   |
| ISO 14130 |         |       | 54.60               | 52.20                         |                |         |

## Laminate with Ultrablade™ triaxial fabrics

In the sketch, the red line has a bigger slope due to the higher stiffness of the root laminate fabricated with Ultrablade™ triaxial fabrics. At the same external loading  $F_a$ , the load transferred to bolt  $F_b^1$  (for Ultrablade™ triaxial fabrics made root joint) is lower than  $F_b^2$  (for traditional fabrics root joint).



## Effect of fabric modulus on the stress in the tension bolt



Impact of fabrics modulus on the bolt loading under same external blade load condition.

With fabrics modulus increased from traditional 28GPa to Ultrablade™ 42GPa, the external loading transferred to the bolt is reduced by 17%.

17% reduction on the transferred loading to bolt will increase the bolt fatigue life substantially.



INNOVATIONS FOR LIVING™

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