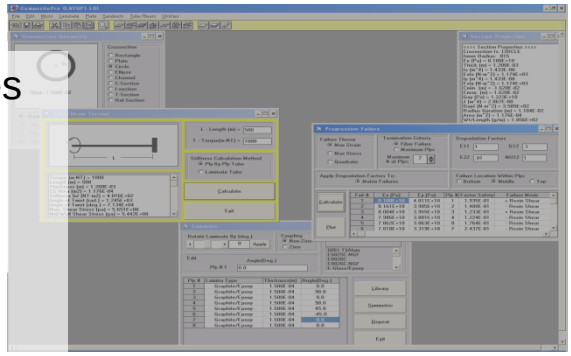
FUJIKURA COMPOSITES

# Features of CFRP Cylindrical Products

## High Accuracy Processing Technique was realized for both inner and outer diameter

- Our shaft is fabricated with high precision for not only outer diameter by polishing but also inner diameter by sheet winding process.
  As compared with a steel pipe, the CFRP shaft with very high accuracy for both inner and outer diameter dimension has high torsional buckling limit.

## High Lamination Flexibility



**The characteristic calculation software for laminated CFRP**

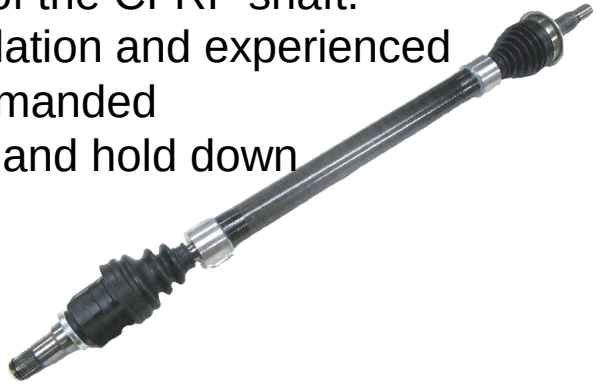
- Since CFRP of cylindrical geometry have no worries about warpage occurrence, it is not necessary to make it symmetrical lamination which is fundamentals for plate geometry. Therefore, the flexibility of lamination is very high and it is also possible to adjust EI and GIp freely in one shaft. Moreover, since extra lamination can be excluded, it is possible to control the material usage by designing correctly.

## FUJIKURA COMPOSITES proprietary technology, strength improvement lamination method

## Simultaneous Multi Ply Winding*

* WO2010/084809 A1

- As a result of analyzing the structure by sheet winding, we developed special lamination structure, which reduces the risk of delamination that is a weak point of CFRP cylinder, and it restrains the damage such as fiber buckling which occurs inside of the CFRP shaft.
- We find out the optimal lamination by calculation and experienced knowledge based on exams against the demanded specifications such as stiffness or strength, and hold down the material usage to necessary minimum.



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