



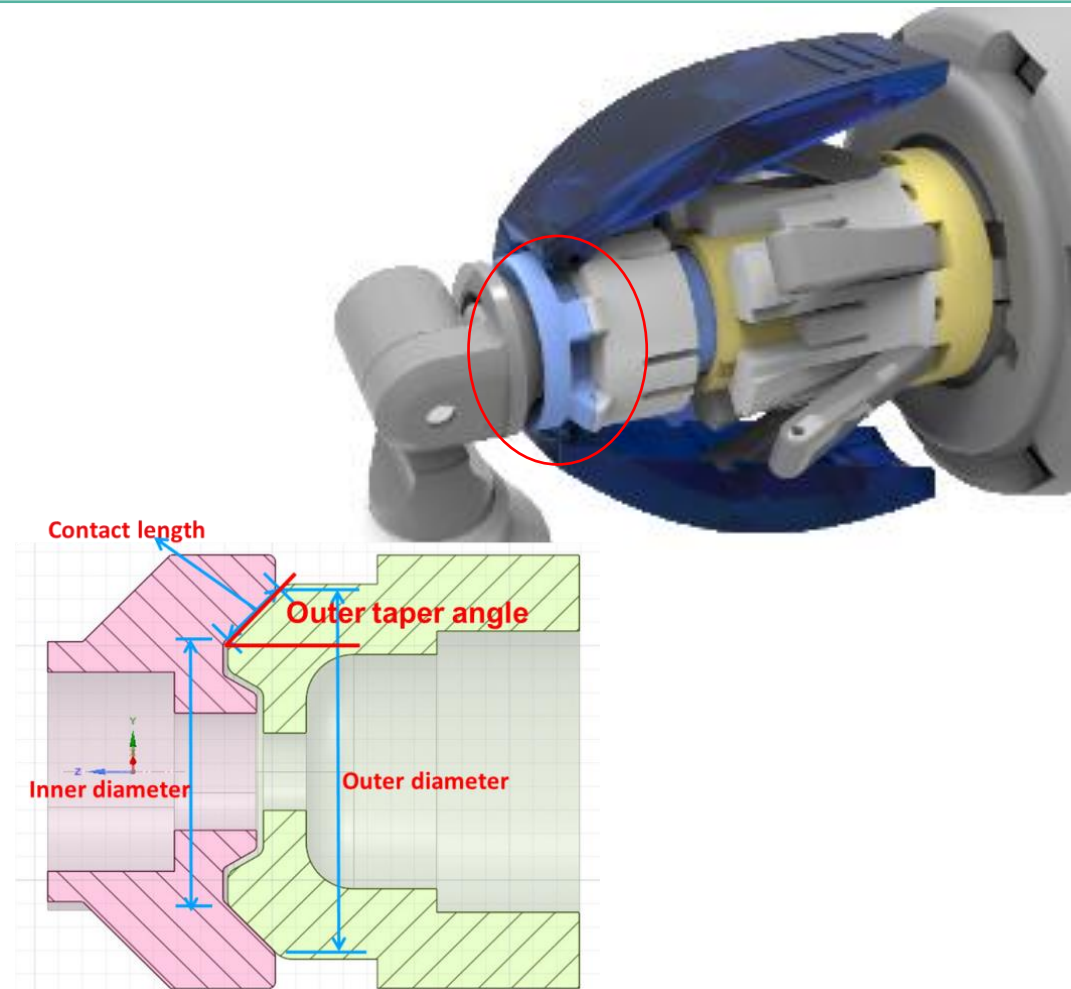
Sensitivity study of Remote robotic controller joint assembly



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Objective :

- The objective of this study is to figure out the best design variables which can minimize the friction that is induced due to the various actions such as direct finger touch load and rotational moment induced by hand. The hand should be able to easily rotate the system which is the roll action where as the End cap should not fall free when left or during application of force.
- Various input parameters such as the outer taper angle, input taper angle, Spring washer pre tension load, Washer spring constant, material, inner and outer surface area have been considered as key input parameters.



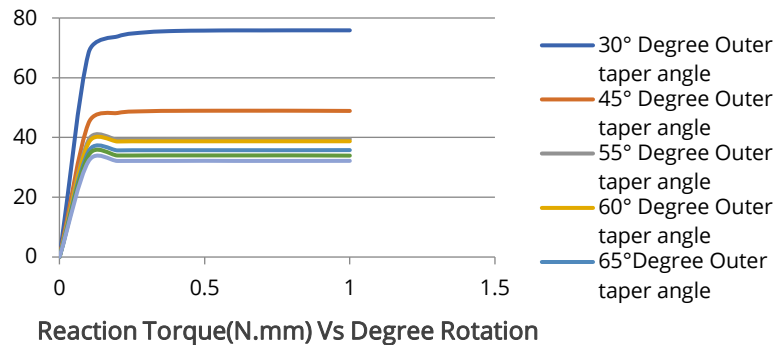
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Task Executed:

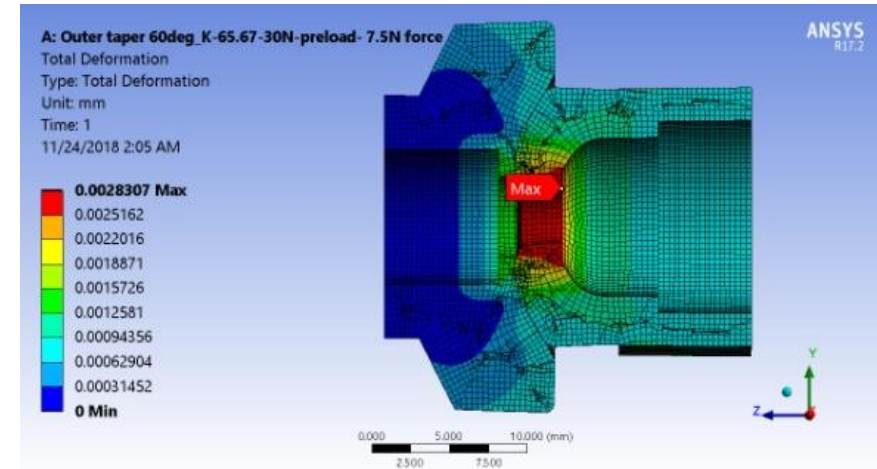
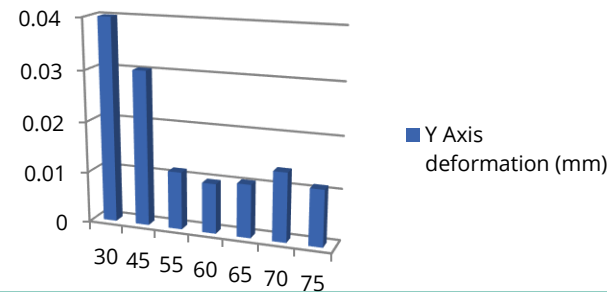
- Four Load cases are run for every iteration.
- Each iteration has 4 load cases, hence we have run 40 simulation results.

Conclusion & Reliability: The design was optimized at 30N pretension load, with a 45degree surface contact angle and the best-suited material for this application is Delrin AF.

Cost Savings: The material was changed from Delrin 150 to Delrin AF due to which we were able to achieve 15% cost savings in the component and a performance rise of 25% by choosing suitable variables.



Y Axis deformation (mm) wrt Outer Tapper Angle



Y Axis deformation (mm)

