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Two Roller Vertical Flow Forming Process for EN36B Steel

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Introduction

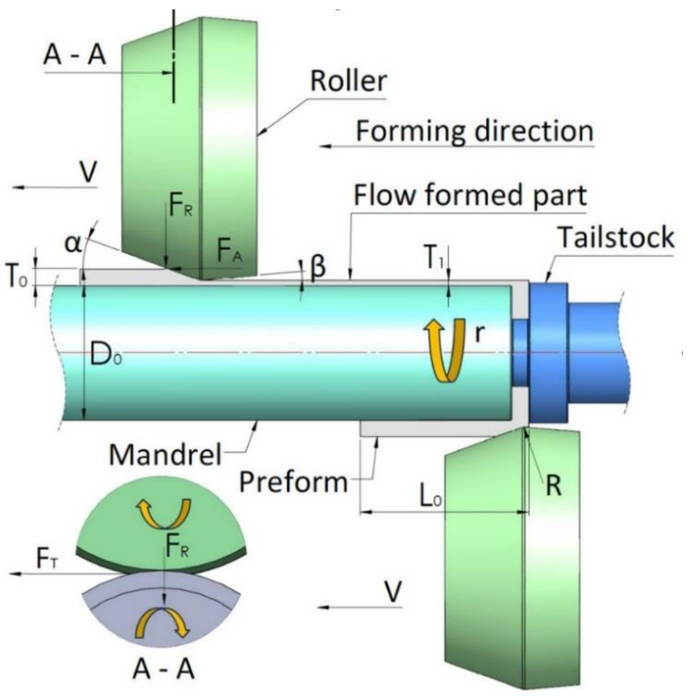


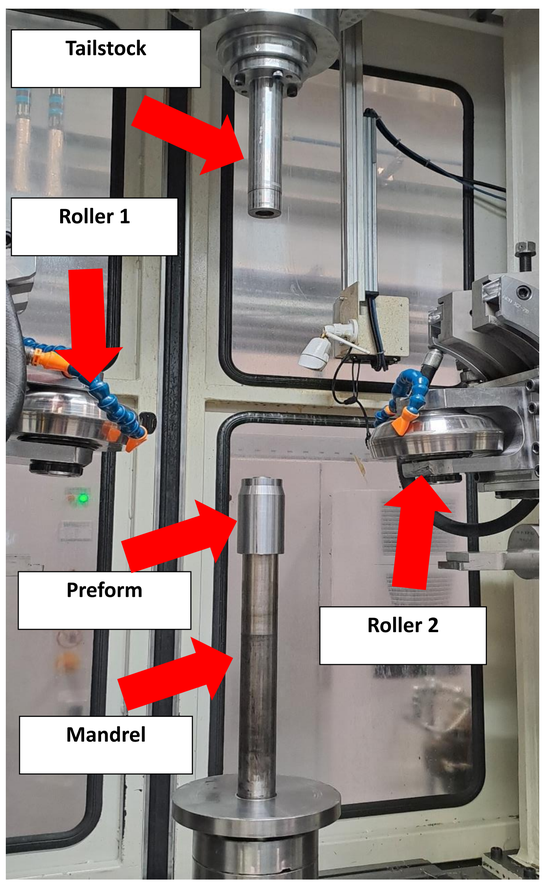
Figure 1 Forward flow forming process technique

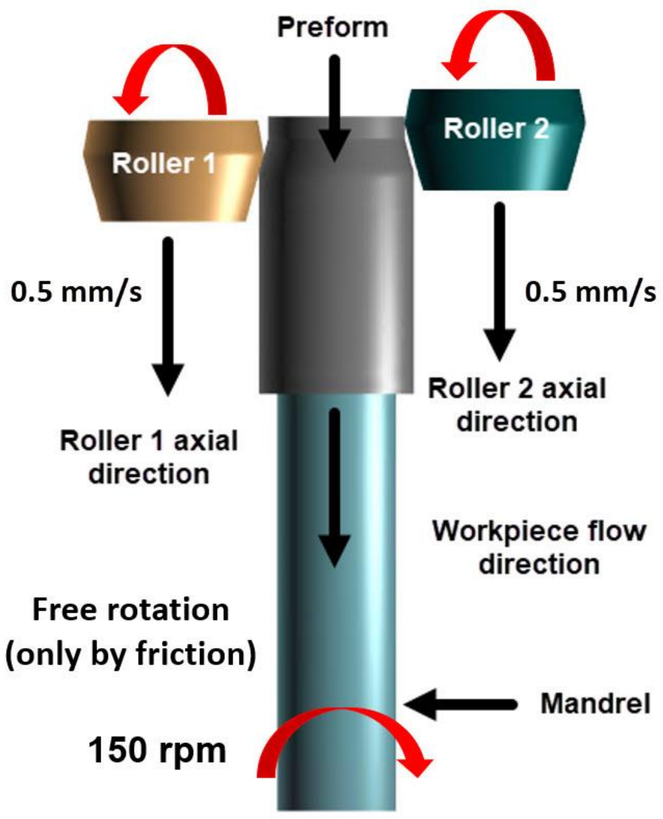
In the forward flowforming, the material is displaced in the same direction as the movement of the rollers

Methods

- Finite element method verification of vertical forward flowforming with 3D GOM scan method
- Experimental and numerical investigation of hardness results

Graphics / Images





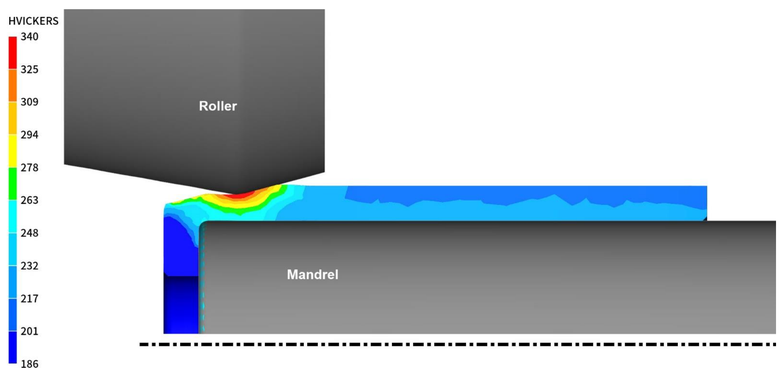
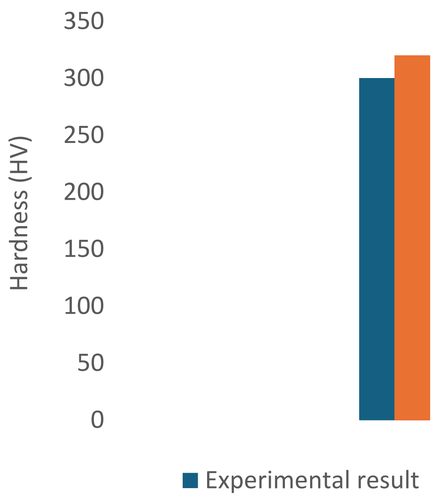


Figure 2 Experimental and Finite Element Analysis (FEA) of vertical flow forming process



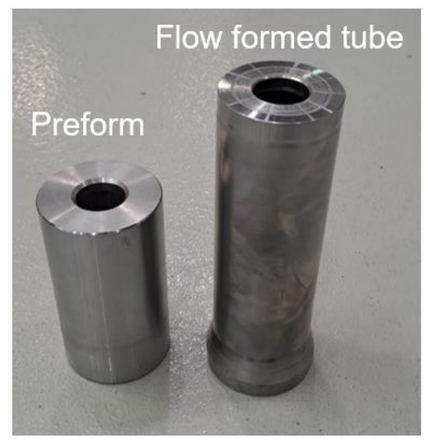
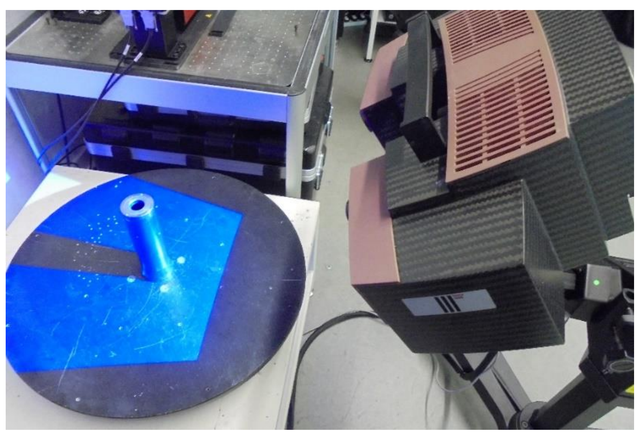


Figure 3 Experimental and FEA hardness comparison



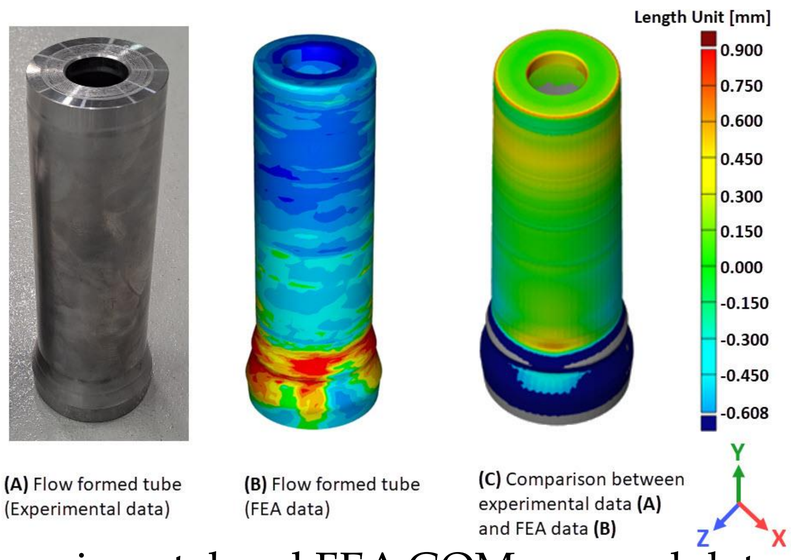


Figure 4 Experimental and FEA GOM scanned data comparison

Conclusions

The EN36B preform shows significant improvement in hardness, mechanical, and dimensional properties after forming

Starting at ~186 HV, flow forming with 50% reduction results in a varied hardness across the cross-section.

The hardness difference of less than 2% is found between the experiment and FEM results.

3D GOM scan results confirm the high accuracy of the formed tube, validating the robustness of the ALE model in predicting flow forming outcomes.