

WELD LINES IN THE EXTRUSION PROCESS: A NUMERICAL STUDY

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In this work we present a numerical and experimental study on the flow behavior of a polymer melt around the spider leg of a prototype extrusion die. For this purpose, we analyze the relationship between the thermo-mechanical conditions in which the weld lines are formed and the location of the spider leg, taking into account the type of flow developed, the stress, velocity and pressure fields. Experimental extrusion runs were also performed in the same conditions using on the numerical studies and the resulting extrudates were mechanically characterized. The information obtained from both numerical and experimental tests provided a good description of the aforementioned relationship, allowing in this way to establish a correlation between the spider leg location and the weld-lines strength.

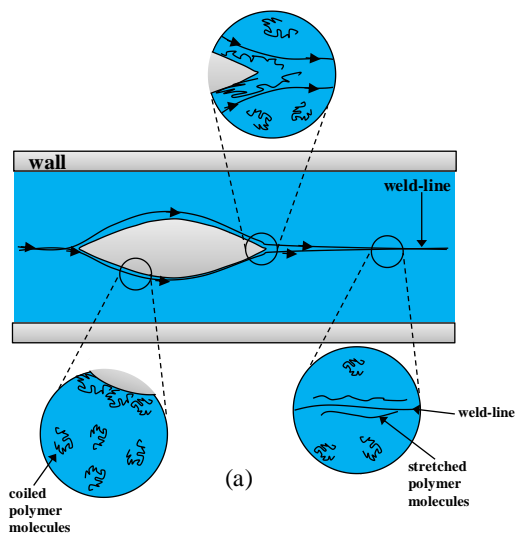


Figure 1: Formation of weld lines.