

An Experimental Investigation of the Fabric/Tool and Fabric/Fabric Friction during the Thermoforming Process

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ABSTRACT:

The thermoforming of quality composite parts using thermoplastic woven fabrics requires the use of in-plane forces to prevent fabric wrinkling for compound curvature surfaces. These in-plane forces are developed during the forming process by the friction between the fabric and tool. For multilayer formings, the in-plane force is a consequence of the interaction of the adjacent layers of fabric. If the in-plane forces are too low, then the formed parts may wrinkle as the fabric deforms to assume the shape of the punch. If the in-plane forces are too high, then the fabric can become damaged by tearing and yarn separation. Thus, controlling the in-plane forces is critical to achieving a quality part.

1 INTRODUCTION

In the current research, the application of a load-control friction testing machine to investigate tool/fabric friction and interlayer fabric/fabric friction is discussed. The friction behavior is and velocities that explored for the range of pressures,

temperatures could be seen by the fabric during a typical thermoforming process. The studied fabrics include a balanced plain weave, a balanced twill weave and an unbalanced twill weave.

This paper will be completed later