

### **473f Twin Screw Extrusion Processing of Double Base Propellant**

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Continuous processing of energetic materials offer significant advantages in safety and process/product quality control versus conventional batch processing methods. Here the twin screw extrusion processing of a double base propellant employing a fully-intermeshing and co-rotating twin screw extruder is reviewed. The rheological behavior of the double base propellant was characterized employing a capillary rheometer in conjunction with multiple dies with differing diameters at constant length/diameter ratio and multiple length/diameter ratios at constant diameter followed by the mathematical modeling of the twin screw extrusion flow and the model based design of the annular die. A thermal imaging camera was used for the determination of the temperature distributions of extrudates emerging out of the capillary rheometer and the twin screw extrusion flows. The FEM results were compared with the results of the numerical simulation studies. Overall, this study points to various challenges and opportunities in the continuous processing of energetics and will review some of the pertinent factors.