

عنوان مقاله:

Injection Properties According to the Inner Shape of Metal Additive Layer Manufactured Coaxial Injectors

محل انتشار:

دوماهنامه مکانیک سیالات کاربردی، دوره 15، شماره 4 (سال: 1401)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

The application of three-dimensional (3D) printing technology in rocket engine development has numerous benefits considering cost and time. Among the various techniques of 3D printing, the selective laser melting method has the advantage of being able to manufacture complex structures and process multiple materials. In this study, five types of coaxial injectors with different internal configurations were manufactured using metal 3D printing. To confirm the atomization and mixing performance according to the structure of each injector's oxidizer and fuel post, a cold flow test using water and air was performed under a wide range of experimental conditions. As a result of analyzing the injection pressure drop, discharge coefficient, spray pattern, breakup length, and spray angle, the shape of the oxidizer post had a significant influence on the performance of the injector. In comparison, the effect of the fuel post structure was relatively small; however, there was a meaningful difference in the breakup length and spray angle depending on the direction of rotation.

کلمات کلیدی:

3D printing, Cold flow test, Shear coaxial injector, swirl coaxial injector, spray characteristics

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