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Magnetic 3D Printing Filament Development and Printing Methods DANIEL LUNA, Department of Physics, Texas State University, CAMILA BELDUQUE, MSEC, Texas State University, HARRISON THRAMANN, SUBASH PANTA, LIAM OMER, Ingram School of Engineering, Texas State University, TANJINA AHMED, MSEC, Texas State University, JITENDRA TATE, Ingram School of Engineering, MSEC, Texas State University, WILHELMUS GEERTS, Department of Physics, MSEC, Texas State University — Due to its innumerable amount of uses and applications, 3D printing technology has grabbed the attention of scientists and engineers around the world. This has led to the development of many types of filaments to suit specific applications. In this case, magnetic filaments have been created using strontium ferrite and NdFeB particles embedded in nylon. A particular interest has been placed on magnetic field assisted additive manufacturing (MFAAM) to aid in particle alignment, yielding a stronger magnetic moment in the printed product. Prints were made with different sized printing nozzles to determine how magnetic properties were affected, which were measured using a Vibrating Sample Magnetometer (VSM). A common issue with the printing process of a magnetic filament is the particles getting clogged in a nozzle if it is too small. Fortunately, the results show that when printed within an applied magnetic field, the samples that were created using a larger nozzle exhibited stronger magnetic characteristics, and are much less prone to clogging. This is significant because it overcomes a major obstacle in the 3D printing of magnetic filaments, greatly increasing ease of use.

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