Special Issue

Precision Manufacturing in Mechanical Engineering: Advanced Structural Design and Applications

Message from the Guest Editors

Precision manufacturing provides reliable high-quality mechanical parts, optical elements, and semiconductor substrates for industrial products. Traditional high-precision material removal manufacturing technologies only allow simple nanometer roughness control. High-precision optical manufacturing allows large-scale integrated circuit manufacturing, where multilayer 2D complex structural design can be realized. With the development of advanced additive precision manufacturing technologies and micro/nano manipulation technologies, micrometer and even nanometer complex 3D structural designs could be directly printed and assembled. These precision manufacturing technologies allow researchers to fabricate large biomimetic surfaces; create nano/micro machines to handle small tissues, single cells, and proteins; print optical elements directly, and regenerate artificial organs with internal microvascular networks. In general, advanced precision manufacturing technologies can enable the creation of complex micrometer and nanometer structures, which also make structural design ever more important and significantly extend the application fields of precision manufacturing.

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