Application of Diamond-Like Carbon to a Rotary Engine

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To reduce wear in automobile-application rotary engines and extend their life, the authors proposed that diamond-like-carbon (DLC) coating, which has superior tribological properties, is applied to a rotary engine part (corner seal). Since wear resistance is required for the surface, the film must be hard. Additionally, in consideration of the high temperature due to the part being next to the combustion chamber, it is desired that the entire film has high heat resistance. To form a DLC film that has multiple properties including heat resistance, adhesion, and wear resistance required by the engine part, the authors discovered that it is possible to control the film’s hardness and heat conductivity via its Si content, and by producing a gradient of Si content in the film, they succeeded in realizing both hardness of the surface and heat resistance throughout the film, thus enabling the practical use of such a rotary engine part (corner seal).

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