

## **Deposition Rates On Stainless Steel Substrates Of Different Surface Roughnesses Under Different Operating Conditions Using Thermal CVD**

*Rahman, M.M.<sup>1</sup>, Chowdhury, M.A.<sup>1</sup>, Nuruzzaman, D.M.<sup>2</sup>, Debnath, U.K.<sup>1</sup>, Kowser, M.A.<sup>1</sup> and Roy, B.K.<sup>1</sup>*

<sup>1</sup>Department of Mechanical Engineering, Dhaka University of Engineering and Technology, Gazipur-1700, Bangladesh

<sup>2</sup> Faculty of Manufacturing Engineering, University Malaysia Pahang, Malaysia

### **ABSTRACT**

A series of experimental tests were carried out to observe the deposition rates on different stainless steel substrates of different surface roughnesses under different operating conditions using a hot filament thermal chemical vapour deposition (CVD) reactor. The test parameters include gas flow rate of methane, temperature of substrate and activation heaters, distance between activation heater and substrate, pressure and duration. There are significant effects of these parameters on deposition rate of different stainless steel materials. It was found that deposition rates strongly depend on different surface roughnesses of the stainless steel substrates under different tested conditions within the observed range. Tribological properties, especially friction and wear of these stainless steel materials sliding against SS 314 under different normal loads and sliding velocities are also investigated before and after deposition. The obtained results reveal that the values of friction and wear are lower after deposition than that of before deposition.

**Keywords:** deposition rates, surface roughness, thermal CVD, chemical vapour deposition, stainless steel, friction coefficient, wear rate, steel substrates, surface quality, gas flow rate, methane, temperature, pressure, duration, tribology, sliding velocities

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