

Technology of Surface Coating - Video course

COURSE OUTLINE

Significance of Surface engineered materials in modern engineering application, surface dependent engineering properties (mechanical, chemical, thermal, electrical, electronic, optical). Role of surface coating and surface modification technologies in obtaining required surface characteristics of a product. Various surface modification techniques (mechanically modified, thermally modified). Scope of their application. Different surface coating technologies: chemical vapour deposition, physical vapour deposition, electro – deposition, electro – less deposition, thermal spray process, coating deposition by wetting. Various process parameters controlling the yield of the coating and various surface properties of the coating. Criteria for selection of a surface coating technology. Product oriented surface coating technology. Different coating systems and function of various elements of coating system. Substrate technology and its significance in obtaining high performance coating. Physical and mechanical characterization of the coating. Various methods for evaluating the performance of the coating.

COURSE DETAIL

Sl.No	Module wise / Lecture wise
1.	Surface Coating
	1. Introduction
2.	CVD Coating
	2. CVD reaction 3. Adhesion of CVD coating 4. CVD System 5. CVD of TiC 6. Chemical Vapour Deposition of Nitride Coating 7. Chemical Vapour Deposition of Carbo-Nitride Coating 8. Chemical Vapour Deposition of Chromium 9. Chemical Vapour Deposition of Aluminium Oxide 10. Chemical Vapour Deposition of Diamond
3.	Physical Vapour Deposition
	11. Vacuum Evaporation Deposition 12. Reactive Evaporation Deposition 13. Cathodic Arc Evaporation Deposition 14. Sputtering 15. Magnetron Sputtering 16. Unbalanced Magnetron Sputtering 17. Radio Frequency and Pulsed DC sputtering 18. Sputter Deposition of Nitride Coating 19. Sputter Deposition of Molybdenum Di sulphide coating 20. Influence of Architecture of Sputter Deposited Molybdenum Di



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Mechanical Engineering

Coordinators:
Prof. A.K. Chattopadhyay

Department of Mechanical Engineering IIT Kharagpur

	Sulphide Coating
4.	Electro Chemical Deposition
	21. Electro Plating, Anodizing and Electro-Less Plating 22. Coating of Monolayer Abrasive grain by Electro Plating
5.	Surface Coating by Wetting
	23. Mechanism of Wetting 24. Coating on Ceramics by Wetting 25. Coating of Monolayer Abrasive grain by Wetting
6.	Application of Surface Coating
	26. Coating on Abrasive grain
7.	Thermal Spray Process
	27. Combustion Spray Process 28. Plasma Spray Process
8.	Modified Surface Layer and Integral Coating
	29. Mechanical, Chemical and Ion-Assisted Method
9.	Advanced Technology of Surface Coating and Layering
	30. Advanced Technology of Surface Coating and Layering
10.	Vacuum Technology for Deposition of Coating
	31. Production of Low Vacuum 32. Production of High Vacuum 33. Measurement of Low Pressure and Gas Flow in Coating Deposition System
11.	Characterization of Coating
	34. Physical Characterization 35. Assessment of Coating Hardness 36. Assessment of Friction and Wear of Coating 37. Assessment of Surface Roughness and Thickness of Coating 38. Assessment of Adhesion of Coating

12.	Performance Evaluation of Coated Product	
	39.Performance Evaluation of TiN Coated Tool 40.Performance Evaluation of CVD Diamond Coated Tool	