



## High-Velocity Air Fuel Spraying

In the quest for eco-friendly alternatives to **hard chrome plating (HCP)**, scientists from the **International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI)**, an autonomous institution of the **Department of Science and Technology (DST)** affiliated institution, have pioneered a technique called high-velocity air fuel spraying (HVOF).

- This method holds the potential to transform the landscape of surface coatings, **offering a safer and more efficient solution** for car parts, tools, and kitchen utensils.
  - HCP is an **electroplating process** in which a layer of chromium is applied to a surface to **improve corrosion and wear resistance, reduce friction, and extend the life of parts** used in extreme working environments.
  - HCP contains **carcinogenic substances** prompting the search for a safer alternative.
- HVOF spraying involves **low temperatures and high particle velocities**, allowing the deposition of coatings using finer-sized powders (5-15  $\mu\text{m}$ ).
  - Scientists synthesized thin hard coatings of a **composite alloy of Tungsten, cobalt, and chromium** by high-velocity air fuel spraying.
- HVOF-sprayed coatings have **shown superior sliding wear performance and corrosion resistance** compared to conventional HCP.
  - The technique **reduces the need for grinding and polishing operations**, leading to **cost savings** in processing and raw materials.
- The new technique can be a better alternative to HCP for heavy-load applications like hydraulic shafts, valves, piston rods, and balls.

Read more: [Nickel Alloy Coatings](#)

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