

Nickel Alloy Coatings

Why in News?

As per an autonomous Research and Development Centre of the <u>Department of Science and Technology (DST)</u>, a new method of deposition of Nickel alloy coatings on engineering-grade materials can replace environmentally toxic chrome plating.

What is Chrome Plating?

About:

- Chrome plating is a process by which a thin layer of chromium is deposited on a metal surface using an electroplating process.
 - The process of depositing a layer of any desired metal on another material by means of electricity is called electroplating.

Properties:

 The chromium layer is highly reflective and provides a hard, durable surface that is resistant to corrosion.

Significance:

 Chrome plating is often used on automotive parts, as well as on household fixtures such as door handles, and in many industrial applications.

Disadvantage:

- The process of chrome plating involves the use of hexavalent chromium, which is a known human carcinogen.
 - It can cause respiratory problems, skin irritation, and an increased risk of lung cancer when inhaled. It can also cause skin irritation, and allergic reactions and can be toxic when ingested.

What is Nickel Alloy Coating?

About:

- Nickel coating provides a unique combination of corrosion and wear resistance. It can add brightness, luster and appeal.
- It also provides excellent adhesion properties for subsequent coating layers, which is why nickel is often used as an 'undercoat' for other coatings, such as chromium.

Applications:

- Aerospace: Nickel alloy coatings are used on aircraft and aerospace components to provide protection against corrosion and wear, as well as to improve the durability and lifespan of the parts.
- **Automotive:** Nickel alloy coatings are used on automotive parts to protect against corrosion and wear, as well as to improve the durability and lifespan of the parts.
- <u>Food Processing</u>: Used on food processing equipment to protect against corrosion and to provide a non-stick surface.

Source: PIB

