# WHY THE GREATEST TOOL IS NOT IN YOUR TOOLBOX

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**ARTICLE TAKEAWAYS:**

- How to make metal wear parts last longer
- Core boxes, patterns, stamping, and extrusion dies benefit from a harder surface

A coating can be one of the greatest tools to use on metal wear parts. But like the tools in your tool box, it has to be applied correctly to be effective.

Thin dense chrome coatings creates a slick, hard surface, and the best thing you can add to a metal wear part. Chrome coatings are known for making parts easier to clean. Users appreciate not having to spend all day scrubbing a part clean just to be able to finally work or rebuild it.

One of the lesser known, but more powerful advantages of these coatings, is that they actually make a part stronger because chrome coatings make a part harder. A stronger/harder part is more durable and longer-lasting and not replaced as often. Maintenance costs are also reduced as well, as less grease or mold releases are needed.

There are many types of coatings on the market today and the chart on the next page details those specifications. When evaluating coatings, remember that price is only one of your considerations and that the least expensive coating per application, might very well be the most expensive coating depending on how long it lasts. Skeptical about how long a coating can really last in your application and in your harsh environment – then do what the big plants do, and test a sample. This is the easiest way to verify claims, in your particular shop's setting.

When a coating does wear out, look for a coating that can be stripped and easily recoated as part of your preventative maintenance program.

Preventing downtime is the name of the game in any production facility. Any foundry or die caster has many opportunities that would benefit from coatings. We see benefits in:

**Core Boxes/Patterns**
Creating a slick/hard surface with chrome coatings makes it easier to remove parts. The core box and pattern will also achieve a higher production rate and they too will be easier to clean and maintain.

**Stamping Dies**
Coating of the stamp will help hold the sharpness of the edge creating a more efficient stamping process.

**Extrusion Dies**
Material that is being extruded passes through with less resistance. This also helps prevent damage to the cutting lip.

Coatings exist to make parts last longer and therefore, reduce downtime on an assembly or mold. Your toolbox is designed to make your life easier. The tools in it are specific to the job that you're working on. The best tool you own may never need to come out of your toolbox.

| | Armoloy TDC | Hard Chrome | Nickelizing | Nyflon 25 | PVD / CVD |
|---|---|---|---|---|---|
| **Base Materials** | All metals except aluminum, magnesium, titanium | Most ferrous and non-ferrous metals: problems with high alloy steels | All ferrous and non-ferrous metals; problems with hihg alloy steels and stainless steels | All ferrous and non-ferrous metals: problems with high alloy steels and stainless steels | No aluminum or alloys with high tin, zinc, or copper content |
| **Surface Hardess (as applied)** | Rc 78 | Rc 62/66 | Rc 50/55 (Rc 60/65 after heat treat) | Rc42/48 | Rc70/90 basis metal modifies surface hardness |
| **Deposit Thickness** | .000010"/.0006" Normal deposits .0001"/.0003" | .000010"+: can and will become cracked and stressed after .0001" deposit | .000050"/.005" max normal deposits .0003"/.0008" range | .0001"/.0007" Rec-ommended deposit is .0003"/.0005" | 000050"/.0002": growth and depth |
| **Uniformity of Deposit** | .0001"±.00002" | Every .0001" =.0001" build up (dog bone effect) | Uniform | Uniform: teflon co-deposited very uniformly within nickel | Uniform |
| **Tolerance** | Must Eng. Properly for ± .00005" "no build up" | Normal edge build-up is .0001" per each .0001" applied | Uniform up to .001"; .001" to .003" ± .0005" ; no edge build up | Uniform up to .0007"; no edge build up | Varies from vendor to vendor |
| **Adhesion** | Absolute: will bend/flex after applied | Good to poor: will chip-crack easily; poor on sharp edges | Good: better than electroless nickel | Good | Good: is eleastic in only one direction flex = cracks |
| **Wear Factor** | Excellent | Good | Better than Electroless nickel | Good | Good |
| **Lubricity** | Excellent: nodular finish | Good to poor: galls against itself | Better than Electroless Nickel | Superior to Electroless Nickel and nickelizing | Fair/good: not good against itself |
| **Corrosion Resistance** | Excellent with .0001"-.0002" deposit | Fair on Deposits less than .001" | Superior at .0005" / .0008" deposit | Excellent at .0005" | Fair |
| **Stripping Characteristics** | Can be stripped | Difficult to do without damage to basis metal | Can be Stripped | Can be Stripped | Very difficult to achieve |
| **Surface Preparation** | Optimum properties between 12/32 RMS. Can improve finish; no bake required | Optimum properties between 12/32 RMS. Should be baked after deposit | Optimum properties between 12/32 RMS. Can be post-baked for hardness | Optimum properties between 12/32 RMS. Post-baked at 300°F | Best results from high alloy, hardened. Good finish on basis material |
| **Cost** | Priced on per job basis | Varies by area and plater | About 50% more than Electroless nickel; Can be rack or barrel plated: | Can be rack or barrel plated: more expensive than Elextroless Nickel | Varies by area and vendor |

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