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Solutions for Coating Trays

Trays are typically used for setting parts that are to be heat-treated/sintered or otherwise put into high temperature for some reason. It is important to prevent reactions with the trays that might deteriorate the performance of the parts being treated – i.e., from diffusion or interaction with the parts that might cause impurities to get into the parts or eutectics to lead to melting at the points of contact with the parts.

ZYP Coatings has several paintable barrier-separation coatings designated for this area-of-use with common graphite and molybdenum trays used with vacuum and inert atmosphere processing:

Aluminum Oxide based coatings

- Prevent sticking, reaction, eutectics
- Ideal for **HIGH COBALT** (to 27% cobalt) parts; also OK for low cobalt parts

Titanium Nitride based coatings

- Prevent sticking, reaction, carbon diffusion, eutectics
- Ideal for **LOW COBALT** (to 8% cobalt) parts

USE AREAS

- I. **Rare Earth Magnet Alloys**
 - a. Samarium-Cobalt (Sm-Co)
 - b. Neodymium-Iron-Boron (Nd-Fe-B)
- II. **Sintering “Hardmetals”**
 - a. Cobalt-bonded Tungsten Carbide
 - b. Titanium Carbide
 - c. Tantalum Carbide
 - d. Titanium Nitride
- III. **Reactive Refractory Metal Processing, Sintering, Producing Powder Metallurgy (PM) Parts**
 - a. Stellite (Cobalt-based alloys)
 - b. Nichrome (NiCr)
 - c. Niobium-Titanium (Nb-Ti) Superconductor alloys
 - d. Superalloys - Hastelloy, Inconel, Waspaloy etc.
 - e. Intermetallics (NiAl, TiAl etc.)
- IV. **Preventing Substrate Reactions – Barrier Layer**
 - a. Stopping Carbon Diffusion/Penetration/Contamination
 - b. Preventing Reaction/Deterioration/Warpage of Refractory Metal Parts/Trays
 - i. Molybdenum
 - ii. Tungsten
 - iii. Tantalum
 - iv. Niobium

RECOMMENDED COATINGS

1. Water-based = [Traycoat AW](#)* (Aluminum Oxide, Al₂O₃)
Good to 1800 C (inert or AIR), 1500 C (vacuum)
*Traycoat AW is the same coating as [Type A1](#) – just named specially for coating trays
1. Water-based = [Traycoat TW](#)* (Titanium Nitride, TiN)
Good to 1900 C (inert), 1600 C (vacuum); NOT FOR AIR (only good to 350 C)
*Traycoat TW is the same coating as [TN-Mod](#) – just named specially for coating trays
3. Solvent-based = [Traycoat A Aerosol](#) (Aluminum Oxide, Al₂O₃), convenient aerosol-can
Good to 1800 C (inert or AIR), 1500 C (vacuum)
*Traycoat A Aerosol is the same coating as [A Aerosol](#) – just named specially for coating trays
4. Solvent-based = [Traycoat A Aerosol Brushable](#) (Aluminum Oxide, Al₂O₃), 'bulk' paint
Good to 1800 C (inert or AIR), 1500 C (vacuum)
*Traycoat A Aerosol Brushable is the same coating as [A Aerosol Brushable](#) – just named specially for coating trays
5. Solvent-based = [Traycoat T Aerosol Brushable](#) (Titanium Nitride, TiN), 'bulk' paint
Good to 1800 C (inert or AIR), 1500 C (vacuum)
*Traycoat T Aerosol Brushable is the same coating as [TN Aerosol Brushable](#) – just named specially for coating trays
NOTE that there is no Traycoat T Aerosol as an aerosol-can: it was discontinued due to cost; the bulk version is equivalent and can be brush-applied or air-sprayed like housepaint.

KEY ADVANTAGES

- Applies like housepaints and ready-to-use after drying
- Reaction-barrier layers
- Allows carbon contents of parts to be accurately maintained
- Stops sticking, reactions including eutectics, and warping
- Controls corrosion, erosion, or dusting of trays
- Extends tray use-lifetime
- Stable in 'hard' vacuum at high temperatures (normal sintering cycles)
- Prevents impurity pickup/contamination
- Replaces expensive plasma-sprayed coatings