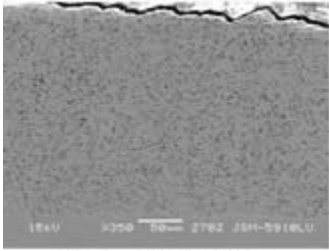


TriCom-H Hard Nano Cobalt Phosphorous Dispersion Coating:



Typical microstructure of CO-P-SiC Electrocomposite coating

Hard TriCom is a hard nano-crystalline electro-composite coating. It consists of a cobalt-phosphorous metal alloy matrix with hard particulates uniformly dispersed within it.

The process involves electroplating cobalt and phosphorous in the presence of hard particulates under conditions allowing the hard particulates to co-deposit with the cobalt phosphorous alloy. The result is a hard electroplated composite material. Engineering

thickness can be achieved for both original equipment manufacturing (OEM) or overhaul and repair (O&R).

Hard TriCom is a proven and accepted alternative to Hard Chromium Plating due to its high “as plated” hardness, excellent wear resistance and low fatigue debit. The superior sliding wear characteristics are achieved due to the tough Co-P metal matrix combined with the hard particulates (such as Cr_3C_2 or SiC) dispersed throughout. Mating materials “ride” on the hard particles which have superior wear resistance compared to metals. The choice of particles to use is application dependent. In addition to its excellent as plated hardness (650 HVN typical), Hard TriCom can be heat treated to further harden the Co-P metal matrix to a range of 700 to 1200 HVN depending on the heat treatment used. Hardening is achieved by phosphorous precipitation hardening of the matrix at relatively low heat treat temperatures (200° to 400° C typical). Hard TriCom is also fully dense with a low susceptibility to cracking, unlike hard chromium, resulting in little fatigue debit to the substrate.

Hard TriCom is also a direct replacement for HVOF coatings. Unlike the Non Line of Site (NLOS) issues associated with the HVOF coating processes, this electro-plating coating can be applied in small inside diameter bores. TriCom is widely used as both a chromium and HVOF coating replacement in cylinder bore applications (such as fluid control actuators) due to its superior wear resistance, environmental soundness and lack of NLOS problems. Once Hard TriCom is applied, it can be honed or ground to the products final dimension and required surface finish. Surface finishes of 2 micro-inch or better are achievable.

Finally, Hard TriCom offers e3cellent corrosion protection, far surpassing that of chromium. Due to its inherent crack pattern, chromium offers low corrosion protection. On the other hand, TriCom is a fully dense, highly corrosion resistant barrier coating able to withstand ASTM B117 salt spray conditions of 200+ hours.

Features & Benefits:

1. Environmentally friendly coating, no hexavalent chrome or nickel
2. Extremely high hardness and low wear resistance
3. Buildup deposits possible from 0.0005 to 0.30
4. No fatigue debit unlike hard chromium having a 50% or greater debit



5. Excellent corrosion protection
6. Non line of sight (NLOS) process, capable of plating small ID bores

Properties:

Hardness

(as-plated) 700VHN

(as heat treated at 200 degrees C) 800 VHN

(as heat treated at 400 degrees C) 1100-1300 VHN

Corrosion Resistance: Exceeds 200 hours ASTM B117

Thermal stability: up to 400 degrees C

Fatigue Debit: Similar to thermal sprayed coatings, such as T-400

Design Recommendations:

See Design Recommendation page

Typical Applications:

Aircraft, power generation, oil & gas components

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