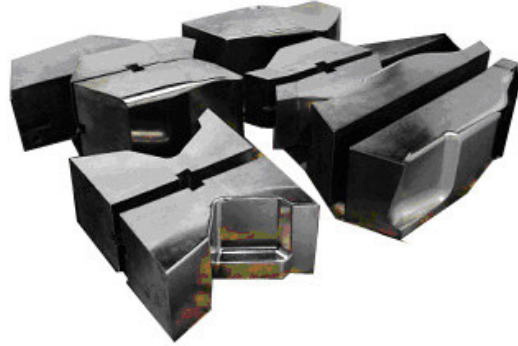


## TD-PLUS Process for Forming Tools

The TD-PLUS coating is the extremely hard vanadium carbide (VC) based coating produced by the TD process, one of the high temperature salt bath treatments.

The TD-PLUS coating, with cross-sectional hardness as high as Hv 4000-4200, protects the work piece surface from wear and seizure. The TD-V/NbC coating, which dramatically improves the durability of work pieces, is highly esteemed as an excellent surface treatment indispensable for the metal forming and mould industry. The salt bath treatment can produce a uniform coating film even on inside "dead areas" regardless of work piece geometry.



Our treatment centers can handle individual parts of up to 1000 lbs and dimensions up to 8"x 27"x 42" (approx) and we offer auxiliary services such as, pre- and post- heat treatment, stripping, bench and polishing.

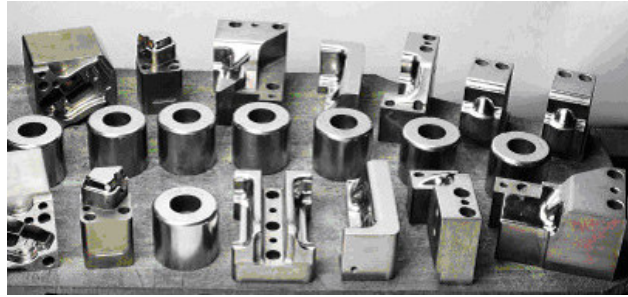
Coating type	Thickness (μm)	Hardness (Hv)	Type of Adherence mechanism
TD-VC	5~15	4000 - 4200	Diffusion type
Cr-plating	30~50	900~1,000	Mechanical type

Properties of the TD-PLUS coating compared to Cr plating

Examples of tools coated include forming tools, hydro forming tools, stamping tools, punches and draw rings.



Form Tools Roll Forming Tools



Form Tools Hydro Forming Tools

Classification	TD-V/NbC	TBS-1500	Hot CVD	PVD	Cr-plating	Nitriding
Type of coating	V/NbC	Fe-B	TiC, TiCN	TiN, CrN	Cr	Fe-N
Coating hardness(Hv)	4000-4200	1,200~1,700	2,300~3,800	2,000~2,300	900~1,000	900~1,000
Coating thickness(μm)	3~15	10~100	3~15	1~5	20~50	10~20
Treatment	Molten salt dipping	Molten salt dipping	Heating in gas	Discharge in nitrogen gas under reduced pressure	Electrolysis in a solution	Aqueous solution
Treatment temp. (°C)	900 -1,000	900 - 1,000	900 - 1,000	400 - 600	50 - 80	500 – 600

Surface treatment comparisons

The TD PLUS process is offered by IonBond to customers throughout North America, including Mexico. You can contact any IonBond center for this service or call our competence center in Stoney Creek at 1 905 664 1996.

For more information, please contact:

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