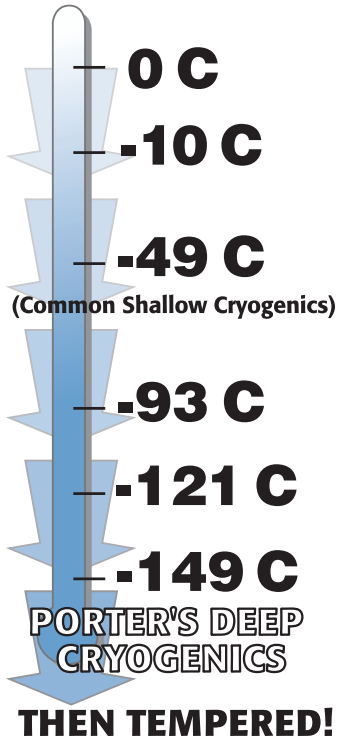


ZEROTEMP is a Porter exclusive combination of deep cryogenics (-149C) treatment plus an additional temper during the heat-treating process. This results in internally altering the entire structure of the steel creating a dense and uniform molecular structure. ZEROTEMP is not a

surface treatment! ZEROTEMP increases internal bonding while releasing internal stresses created by previous machining processes. Computer-controlled gradual cooling and warming cycles eliminate the possibility of thermal shock and prevent parts from becoming brittle.



The Benefits

ZEROTEMP process forms very fine carbide particles throughout the material and increases wear resistance.

ZEROTEMP treatment results in a tougher substrate further increasing part life through reduced impact failures.

ZEROTEMP reduces internal stresses or completely eliminates part movement during the machining process.

ZEROTEMP requires only one treatment as it is a through part molecular change and not a surface layer. The results last the life of the tool. Sharpening will NOT eliminate the benefits.

ZEROTEMP provides increased durability, tensile strength, toughness and stability. Extra life can vary from 100 to 400 percent depending on the tool type and the application.

ZEROTEMP is provided to all Porter Ultra precision punches, dies, and perforators during the blank manufacturing process. This results in no change in appearance. The secondary treatment creates a slight honey color appearance.

Porter Plus (PPC)

This Porter high end coating has been tested and proven to perform better in the high strength automotive steels used today.

A (PVD) process of placing a thin layer of this special coating (2-5 microns thick) over the working area of the punch.

Benefits

- * Surface hardness of 3200 Vickers
- * Dry coefficient of friction versus steel .35
- * Resistant to galling and peeling
- * Thermal stability up to 1100 C
- * More wear resistant than TICN
- * Appears blue-grey

Tin Titanium Nitride

A (PVD) process of placing a thin coating of Titanium Nitride 1-5 microns thick over the working area of the punch.

Benefits

- *Surface hardness of 80-85 RC 2300 Vickers
- *Dry coefficient of friction versus steel .4
- *Resistant to galling and peeling
- *Thermal stability up to 600 C
- Appears gold in color

NG Nitrogenics

Nitrogenic is a Porter exclusive "combination of ZT, followed by a nitride salt bath

Benefits

- *Surface rockwell of Rc 70+
- *No external layer to chip or peel since Nitrogenic is a surface treatment that penetrates approximately .008 deep
- *Resistant to galling
- *Corrosion resistant
- Appears dark grey/black in color

TICN Titanium Carbonitride

A (PVD) process of placing a thin coating of Titanium Nitride 1-5 microns thick over the working area of the punch.

Benefits

- *Surface hardness of 90 RC+ 3000 Vickers harder than Carbide"
- *Dry coefficient of friction versus steel .3
- *Resistant to galling and peeling
- *Thermal stability up to 400 C
- *More wear resistance than TIN
- Appears brown or light blue.

All PVD & CVD coatings are available on Porter M2 and particle steel products. Porter has an extensive background in improving punch and die insert life. Choosing the best base tool steel along with the best surface enhancement will result in more profit for your stamping operation.

Porter has the experience and working relationships to secure the best combination of the above for your needs. Please consult the factory or your salesman for help with your problem applications.