

PerfoWear®

COLD WORK TOOL STEEL

PerfoWear is a cold work tool steel that provides excellent toughness and wear resistance approaches those of high speed steels. PerfoWear is an improvement over alloyed tool steel 1.2379. It eliminates the disadvantages of insufficient hardness and toughness.

APPLICATION AREAS OF PERFOWEAR

- Parts requiring wear resistance
- Cutter blades
- Cold heading dies
- Forming dies
- Cold forging dies
- Mill rolls and slitters
- Press punching dies
- Gauges
- Stepped punch



C%	Cr%	V%	W%	Mo%	Others
1,10	7,70	2,20	1,30	1,40	+

ADVANTAGES OF PERFOWEAR

PerfoWear shows higher abrasion resistance in addition to all the PerfoCut benefits presented below.

• Higher hardness than 1.2379 after heat treatment.

PerfoWear reaches 62-64 HRC hardness after heat treatment. In this way, it shows higher abrasion resistance than 1.2379.

• Twice the toughness of 1.2379 with superior wear resistance.

PerfoWear has relatively well-performing toughness among all cold die steels. Therefore, tools and dies made of PerfoCut are less faced with the problems such as cracking and chipping, which often seriously affect conventional tools and dies.

• Machines and grinds up to 40% faster than 1.2379.

PerfoWear is superior to 1.2379 in machinability and grindability. Therefore, the use of PerfoWear is expected to provide relatively longer tool life and reduces the number of processes in die making.

• Less residual stress after wire Electro Discharge Machining.

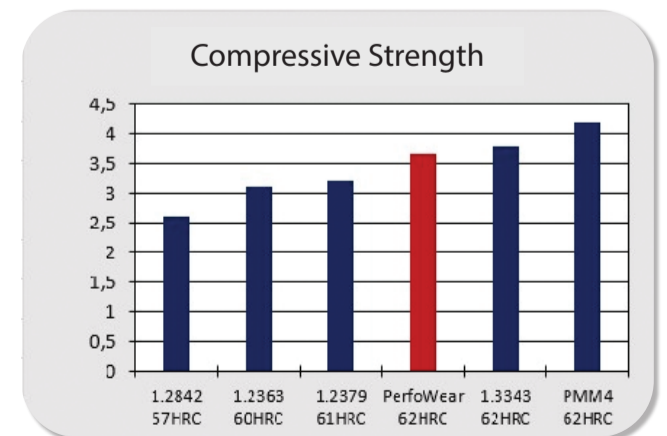
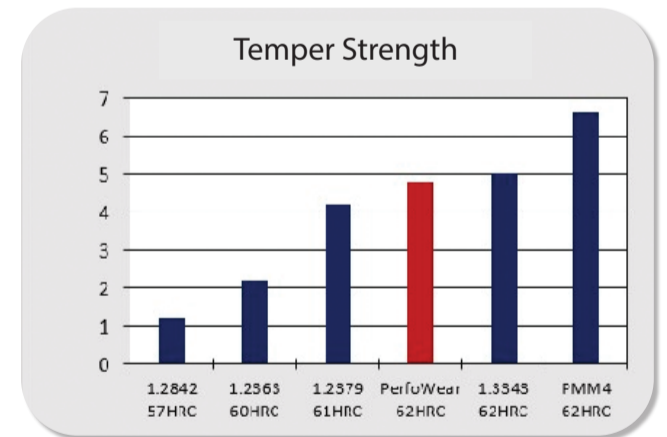
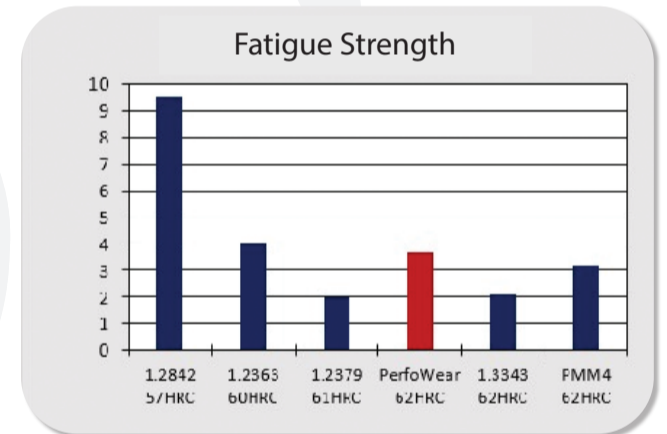
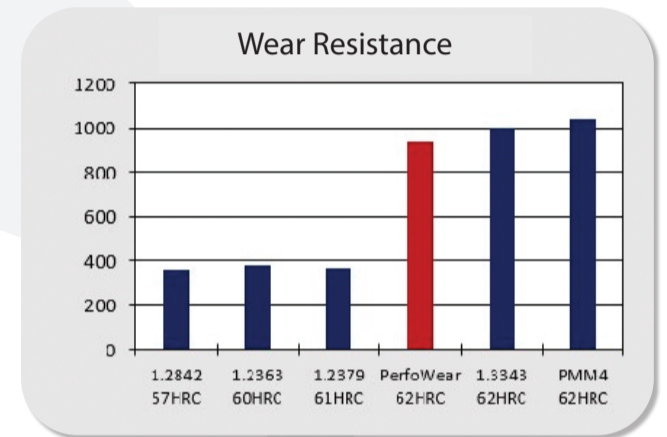
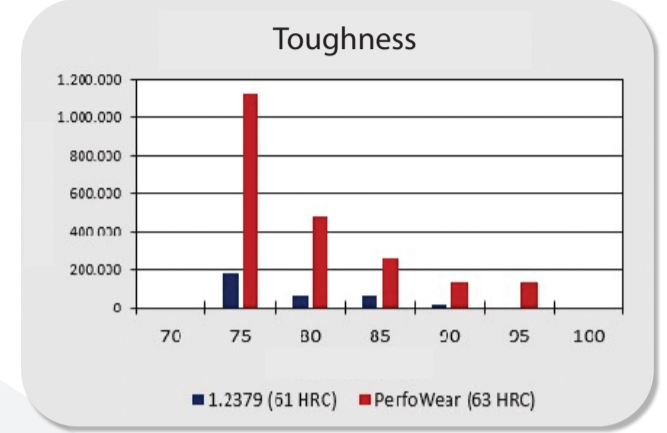
Residual stress is lessened by means of high-temperature tempering. Therefore, problems such as cracking and distortion are prevented during and after wire EDM. PerfoWear was initially developed with the wire EDM process in mind.

• High temper resistance to support PVD and Nitride surface treatments.

PerfoWear can also be hot process CVD and TD (Thermal Diffusion) coated however post heat treatment is generally recommended.

• Uniform distribution of fine carbides.

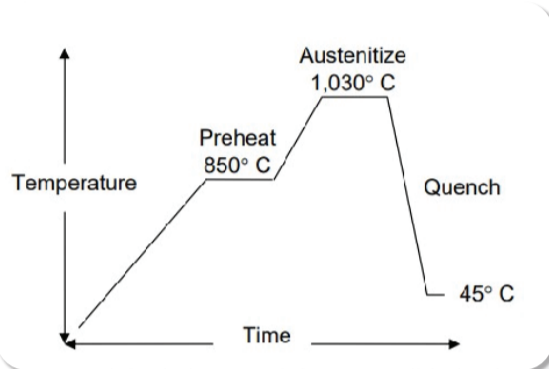
Smaller primary carbides than 1.2379 protect the die from chipping and cracking.



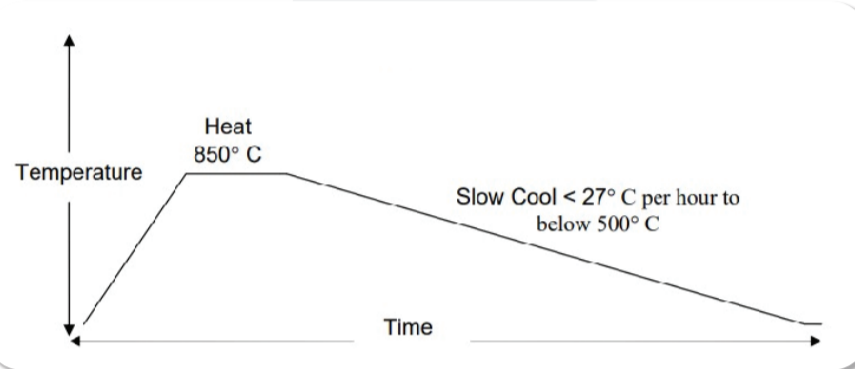
HEAT TREATMENT PROCESS OF PERFOWEAR

PerfoWear is only as good as the heat treatment it receives. The heat treat process can be broken down into two segments, Hardening & Tempering. PerfoWear is typically hardened using a vacuum furnace.

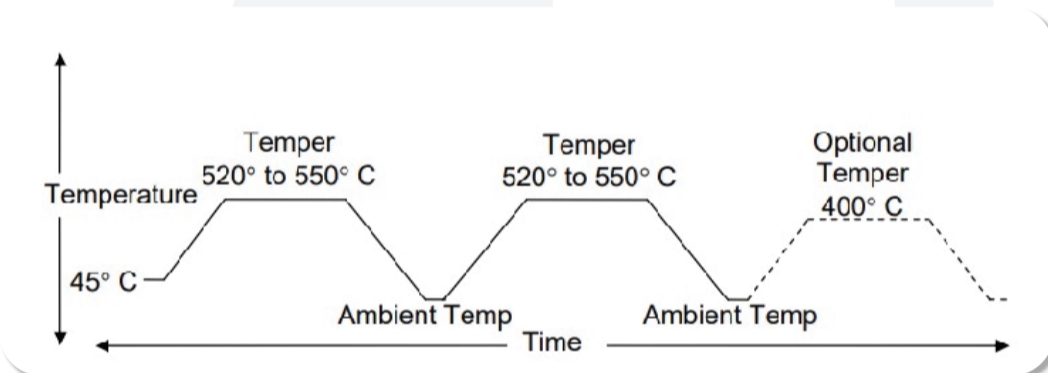
Hardening



Tempering



Annealing



PHYSICAL PROPERTIES OF PERFOWEAR

Thermal Expansion

Temperature	20~100°C	20~200°C	20~300°C	20~400°C	20~500°C	20~600°C
x10 ⁻⁶ /K	11,2	11,9	12,4	12,9	13,3	13,4

Thermal Conductivity

Temperature	25°C	100°C	200°C	300°C	400°C	500°C	600°C
W/m.K	17,8	19,3	20,0	22,5	24,3	24,5	26,3

Specific Heat

Temperature	25°C	100°C	200°C	300°C	400°C	500°C	600°C
J/kg.K	460	471	482	554	620	657	751

Young's Modulus	Modulus of Rigidity	Poisson's Ratio (25°C)
206GPa	79GPa	0,29