ELIZABETH COMPANIES

MATERIALS SELECTION CHART

	Steel Grade	Nature & Application	Benefits		
Punches			S[1]	W[2]	C[3]
S7	ESR - standard	Purefied Tool Steel - All Purpose	X		
A-2	ESR - standard	Purefied Tool Steel - All Purpose	X	X	
D-2	Tool Steel	Abrasive Formulations		X	
440C stainless	ESR - standard	High Chrome - Corrosive Formulations		X	X
M-340	Standard Tool Steel	High Chrome - Corrosive Formulations		X	X
DC-53	Standard Tool Steel	Toughness and Wear Resistance	X	X	
Vanadis 4E	Powdered Metal	Wear Resistance		X	
PM-M4	Powdered Metal	Wear Resistance		X	
Tungsten Carbide	Powdered Metal	Maximum Wear Resistance		X	
Dies & Segments			S[1]	W[2]	C[3]
D-3	Standard Tool Steel	Wear Resistance		X	
PM-15V	Powdered Metal	High Wear Resistance		X	
D-2	Nitrided Tool Steel	High Hardness (die segments)	X	X	
440C stainless	Premium Tool Steel	High Chrome - Corrosive Formulations		X	X
Ceramics	Sintered Silicate	Wear Resistance - low reactivity		X	
Tungsten Carbide	Powdered Metal	Maximum Wear Resistance		X	X

[1]Strength   [2]Wear   [3]Corrosion

	Characteristics	Nature & Application	Benefits		
Coatings			S[4]	W[5]	C[6]
Chrome Plating	Electro-plating	General Purpose Barrier	X	X	
Chromium Nitride (PVD)	Vapor Deposition	Longer Life Barrier	X	X	
Standard Chrome (IBED)	Ion Deposition	Improved surface consistency	X	X	
Chromium Nitride (IBED)	Ion Deposition	Overcome medium surface abrasion	X	X	X
Titanium Nitride (IBED)	Ion Deposition	Overcome high surface abrasion		X	X
Teflon Nickel	Plating	Improved surface lubricity	X		
White Graphite Nickel	Plating	Improved suface lubricity	X		
Diamond Like Coating (DLC)	Deposition	Resistance to abrasion			X
Boron Carbide	Deposition	Resistance to abrasion			X

[4]Sticking   [5]Wear   [6]Corrosion

Elizabeth