ATOMET DB48

ATOMET DB48, containing 4% nickel is a highly compressible diffusion-bonded steel powder, designed for high performance applications. QMP's process diffusion bonds the alloying elements to our water-atomized steel powder, giving excellent consistency and dimensional control without sacrificing compressibility or green strength.

- **Compressibility** - high compressibility extends the benefits of high alloy compositions to high density applications for improved strength and reduced tool stress.
- **Compositional homogeneity** - the diffusion process bonds alloying elements to the iron particles, giving increased compositional homogeneity over premixes of similar composition. This ensures low part-to-part variation and improved part stability.
- **Dynamic properties** - heterogeneous mixture of phases in the sintered part impedes crack growth, improving dynamic properties such as increased ductility and high impact strength and toughness.
- **Consistency** - a stable ore base, modern steelmaking practice and statistically controlled powder manufacturing ensure lot-to-lot consistency and low part-to-part variation.
- **Purity and cleanliness** - state-of-the-art clean steel practice ensures low residuals and sets new standards for cleanliness giving improved mechanical and dynamic properties.

PHYSICAL AND CHEMICAL PROPERTIES

Chemistry, wt%

C	O	S	Mn	Mo	Ni	Cr	P	Si	Cu
0.005	0.10	0.009	0.15	0.50	4.00	0.05	0.01	0.01	1.50

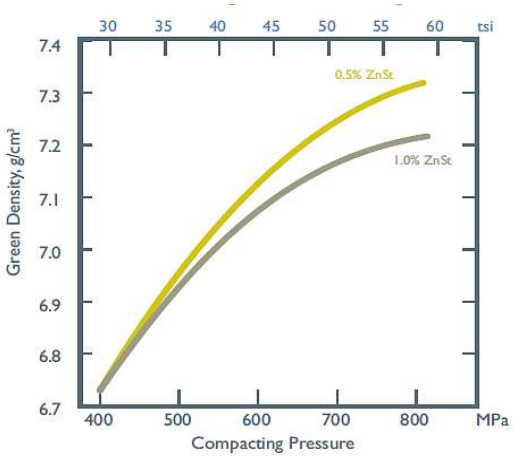
	Particle Size Analysis, wt%				A.D.	Flow	Density*
U.S. mesh	+60	+100	+325	-325	**g/cm^3**	**s/50g**	**g/cm^3**
µm	+250	+150	+45	-45	3.02	24	7.10
	Trace	10	66	24			*@43,5 tsi @600 MPa

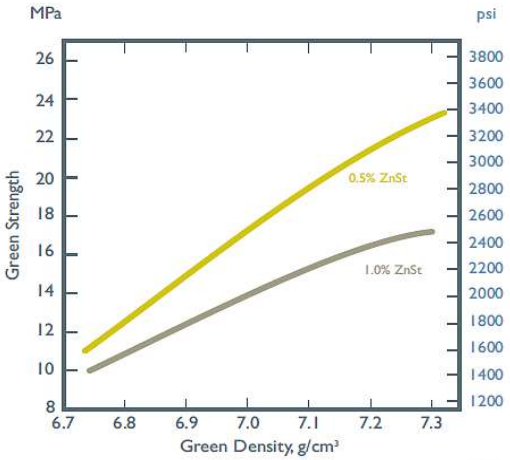
GREEN PROPERTIES

Compressibility

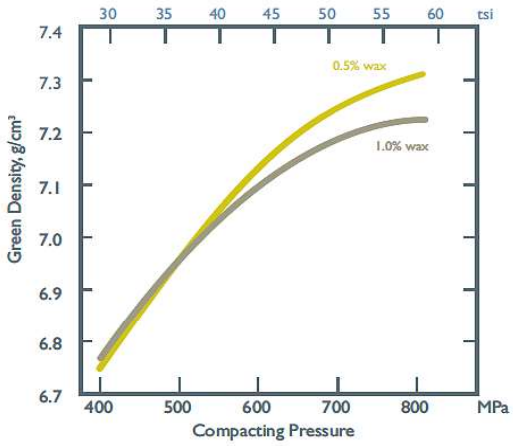
Green Strength

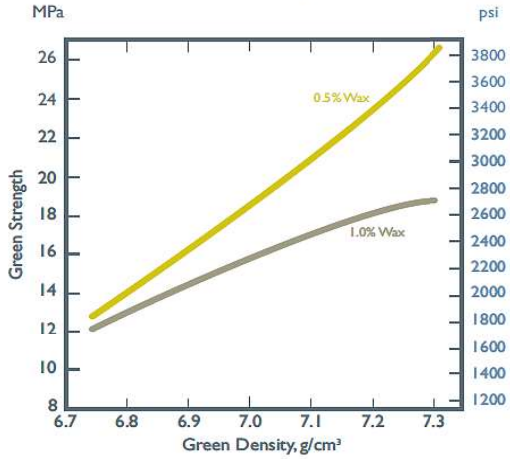
ATOMET DB48 + ZnSt





ATOMET DB48 + Wax

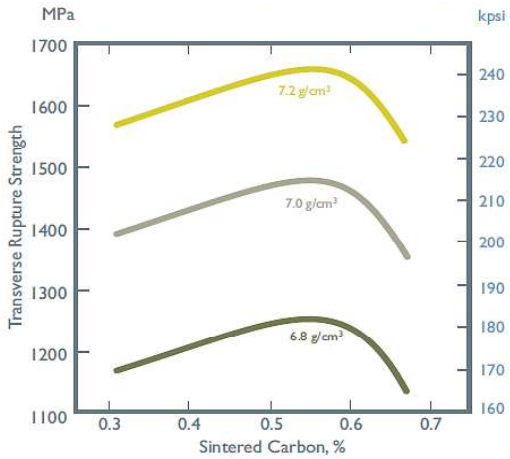




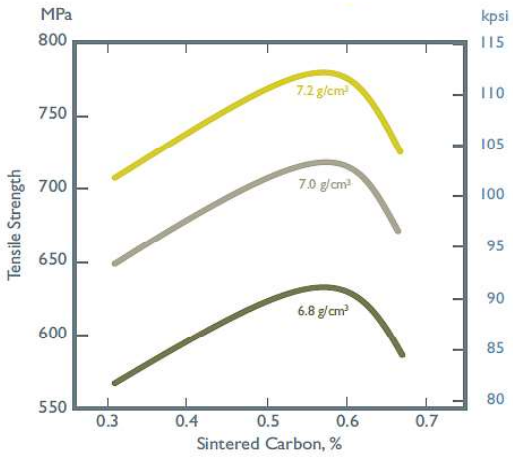
SINTERED PROPERTIES

Composition: **ATOMET DB48** + graphite + 0.75 % wax.
Sintered in a 90% nitrogen-based atmosphere at 1120ºC (2050ºF) for 25 minutes.

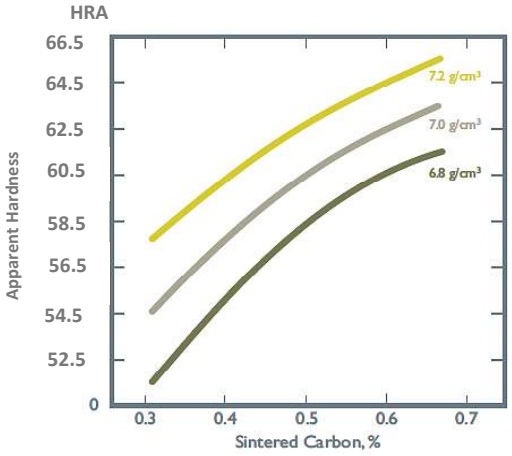
Transverse Rupture Strength



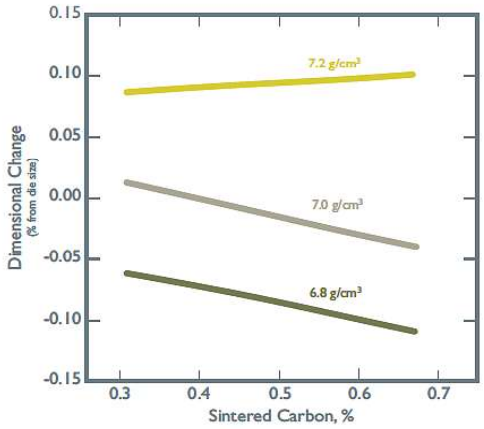
Tensile Strength



Apparent Hardness



Dimensional Change

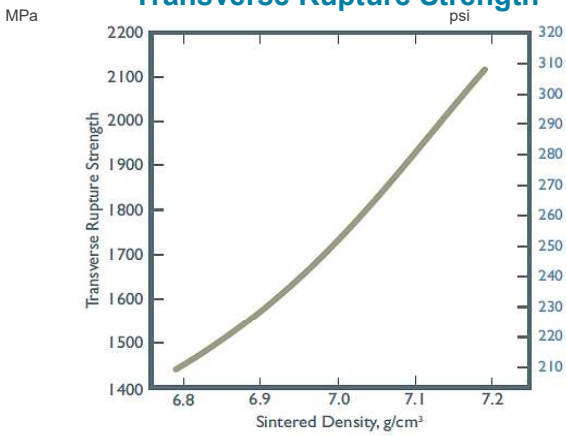


Sintered Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Tensile Strength		Yield Strength		Elongation	Apparent Hardness	Dimensional Change	Impact Energy	
g/cm³	%	%	MPa	kpsi	MPa	kpsi	MPa	kpsi	%	HRA	%	J	lb-ftf
6.80	0.35	0.31	1166	169	566	82	366	53	1.8	51.5	-0.06	14	10
7.00	0.35	0.31	1386	201	641	94	393	57	2.4	55.0	0.01	20	16
7.20	0.35	0.31	1566	227	703	103	428	62	2.5	57.5	0.09	33	25
6.80	0.65	0.57	1248	181	628	92	455	66	0.8	60.0	-0.09	14	10
7.00	0.65	0.57	1469	213	710	104	469	68	1.0	62.0	-0.03	19	14
7.20	0.65	0.57	1648	239	779	113	524	76	1.1	63.8	0.09	24	18
6.80	0.75	0.67	1130	164	586	85	441	64	0.6	61.5	-0.11	12	9
7.00	0.75	0.67	1345	195	669	97	455	66	0.7	62.8	-0.04	18	13
7.20	0.75	0.67	1531	222	724	105	510	74	0.8	65.3	0.10	20	15

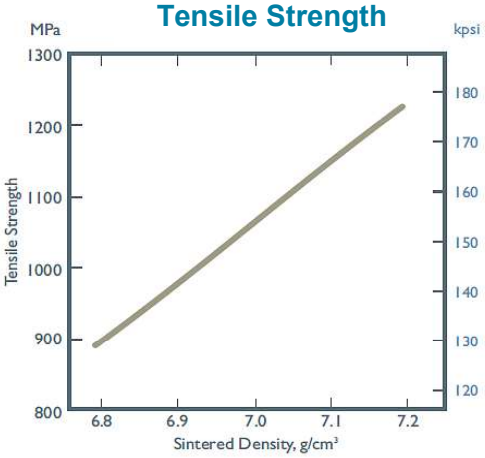
HEAT-TREATED PROPERTIES

Composition: **ATOMET DB48** + 0.45% graphite + 0.75% wax.
Sintered in a 90% nitrogen-based atmosphere at 1120ºC (2050ºF) for 25 minutes.
Heat-treated 15 minutes at 850ºC (1560ºF), atmosphere with 0.8% carbon potential.
Oil quenched and tempered 1 hour at 175ºC (350ºF).

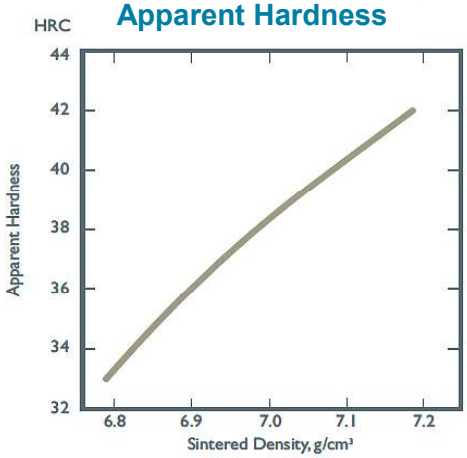
Transverse Rupture Strength



Tensile Strength



Apparent Hardness



Sintered Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Tensile Strength		Yield Strength		Apparent Hardness	Impact Energy	
g/cm³	*%*	*%*	*MPa*	*kpsi*	*MPa*	*kpsi*	*MPa*	*kpsi*	*HRB*	*J*	*lb-ftf*
6.80	0.45	0.40	1445	211	897	130	779	113	31	11	8
7.00	0.45	0.40	1724	250	1069	155	883	128	36	14	10
7.20	0.45	0.40	2145	311	1234	179	993	144	41	15	11

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