ATOMET 29M

ATOMET 29M* is a sulphur-free iron powder designed for medium density powder metallurgy applications requiring superior machining properties. This product uses boron nitride to significantly reduce friction at the clip-tool interface.

*** ATOMET 29M** is a patented QMP product

- **Machinability** – **ATOMET 29M** reduces thrust force requirements and allows for better machining of higher strength parts.
  - Increases machining tool life.
  - Improves machinability at high carbon levels.
  - Increases productivity of P/M machining operations.
- **Boron nitride** - **ATOMET 29M** uses boron nitride instead of sulphur-bearing compounds as a machining enhancer.
  - Reduces dimensional change variations.
  - Maintains sintered strength.
  - Avoids sulphur corrosion of sintering furnace components.
- **Consistency** - the outstanding compressibility of **ATOMET 29M** extends the benefits of low alloy compositions to high density applications above 7.0 g/cm^3.
  - Higher strength, higher density P/M parts.
  - Reduced tool stress.
- **Non-toxic ingredient** - the boron nitride component of **ATOMET 29M** is a inert, non-toxic compound.
  - Non-hazardous to the environment.

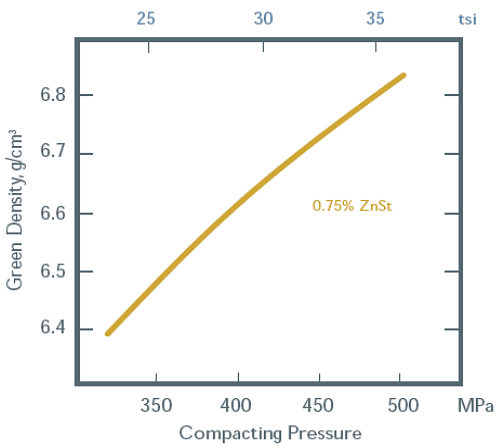
PHYSICAL AND CHEMICAL PROPERTIES

Chemistry, wt%						Particle Size Analysis, wt%				A.D.	Flow	Density*
C	O	S	Mn	Fe	U.S. mesh	+60	+100	+325	-325	g/cm^3	s/50g	g/cm^3
0.05	0.16	0.006	0.008	99+	um	+250	+150	+45	-45	2.95	26	7.00
						Trace	5	73	22			*@43.5 tsi @600 MPa

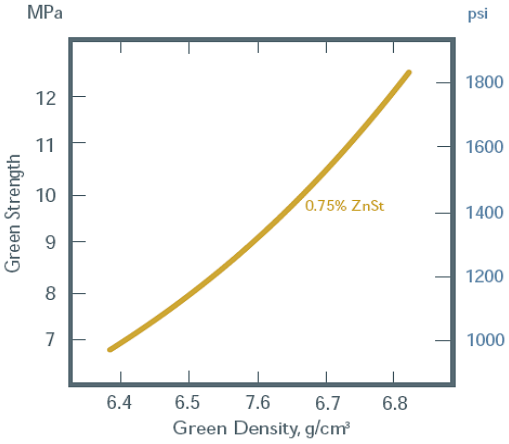
COMPACTING PROPERTIES

ATOMET 29M + ZnSt

Compressibility



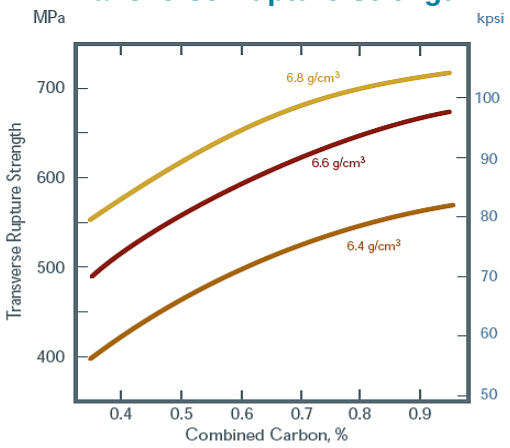
Green Strength



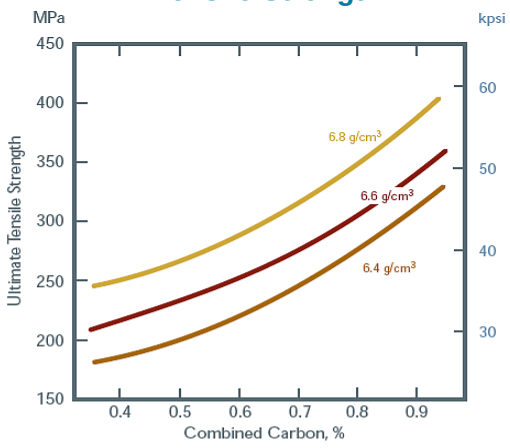
AS-SINTERED PROPERTIES - Carbon Steel

Composition: **ATOMET 29M** + graphite + 0.5% ZnSt.
Sintered in a rich endo atmosphere at 1120ºC (2050ºF) for 30 minutes.

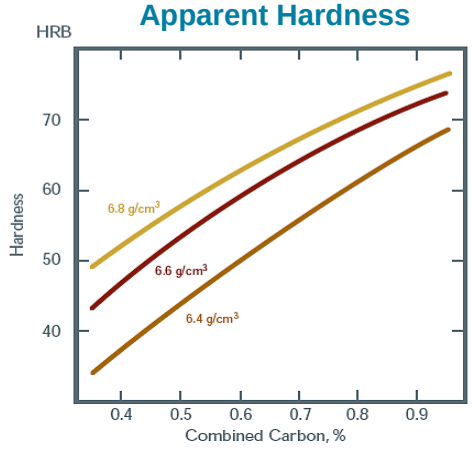
Transverse Rupture Strength



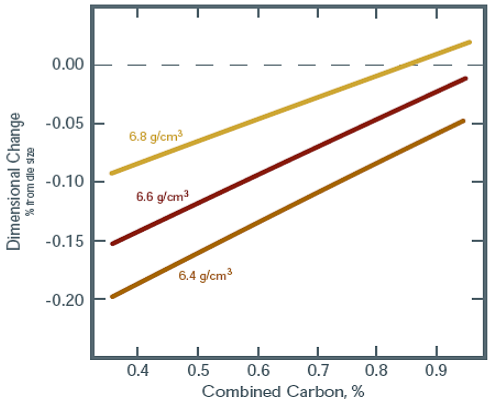
Tensile Strength



Apparent Hardness



Dimensional Change

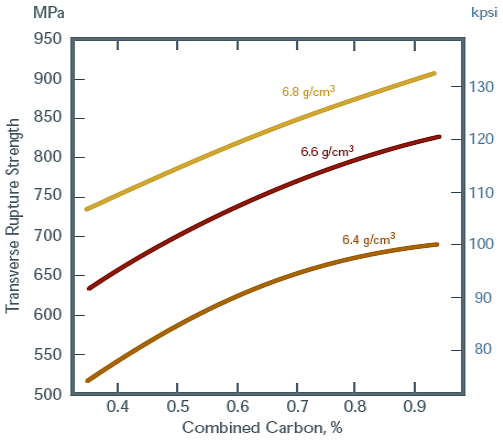


Material Designation Code	Green Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Combined Carbon	Tensile Strength		Yield Strength		Elongation
MPIF Std 35	g/cm³	%	%	MPa	kpsi	HRB	%	%	MPa	kpsi	MPa	kpsi	%
F-0000	6.40	0.30	0.31	365	53.00	31	-0.21	0.28	170	25	135	19.4	3.0
	6.60	0.30	0.30	450	65.40	40	-0.17	0.26	200	29.2	155	22.6	4.1
	6.80	0.30	0.30	515	74.60	46	-0.10	0.26	230	33.0	180	26.2	4.1
F-0005	6.40	0.60	0.63	500	72.40	52	-0.13	0.60	220	32.2	205	29.9	0.8
	6.60	0.60	0.61	600	86.80	59	-0.09	0.58	250	35.9	220	32.2	1.2
	6.80	0.60	0.60	655	95.00	63	-0.05	0.57	280	40.6	250	34.9	1.6
F-0008	6.40	0.90	0.83	545	79.20	63	-0.08	0.83	285	41.5	265	38.3	0.3
	6.60	0.90	0.82	655	94.70	69	-0.04	0.83	315	46.0	285	41.4	0.7
	6.80	0.90	0.79	705	102.1	71	-0.01	0.81	355	51.3	300	43.8	1.0

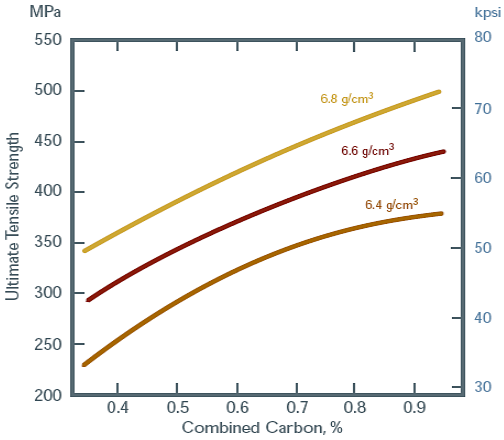
AS-SINTERED PROPERTIES - Copper Steel

Composition: **ATOMET 29M** + 2% copper + graphite + 0.5% ZnSt.
Sintered in a rich endo atmosphere at 1120ºC (2050ºF) for 30 minutes.

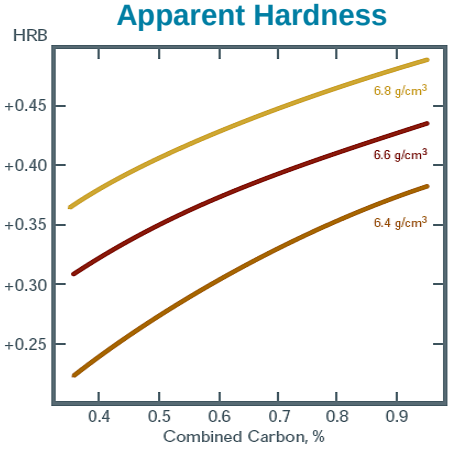
Transverse Rupture Strength



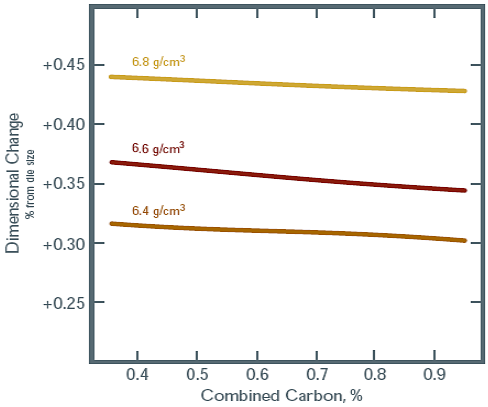
Tensile Strength



Apparent Hardness



Dimensional Change

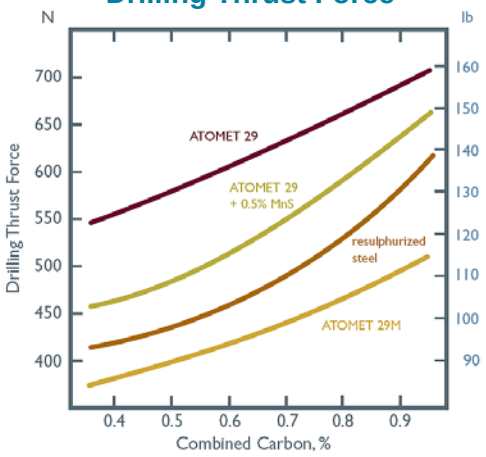


Material Designation Code	Green Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Combined Carbon	Tensile Strength		Yield Strength		Elongation
MPIF Std 35	g/cm³	%	%	MPa	kpsi	HRB	%	%	MPa	kpsi	MPa	kpsi	%
F-0000	6.40	0.30	0.30	490	70.90	55	0.32	0.3	210	30.3	185	28.6	0.9
	6.60	0.30	0.29	600	87.20	64	0.37	0.28	260	37.9	220	31.6	1.5
	6.80	0.30	0.29	715	103.70	69	0.44	0.28	320	46.2	260	38	2.0
F-0005	6.40	0.60	0.61	625	90.60	66	0.31	0.60	320	46.4	300	43.6	0.5
	6.60	0.60	0.60	735	106.50	72	0.36	0.58	365	52.9	335	48.9	0.8
	6.80	0.60	0.59	820	118.70	78	0.43	0.57	410	59.8	290	42.4	1.1
F-0008	6.40	0.90	0.83	680	98.30	71	0.30	0.84	365	53.2	360	52.3	0.2
	6.60	0.90	0.81	800	116.00	76	0.35	0.82	420	60.7	395	57.2	0.5
	6.80	0.90	0.80	880	127.80	82	0.43	0.79	465	67.7	425	61.6	0.8

MACHINABILITY COMPARISONS

All mixes contain 0.5% ZnSt and have a density of 6,7 g/cm^3.
Sintered in a rich endothermic atmosphere at 1120ºC (2050ºF) for 30 minutes.

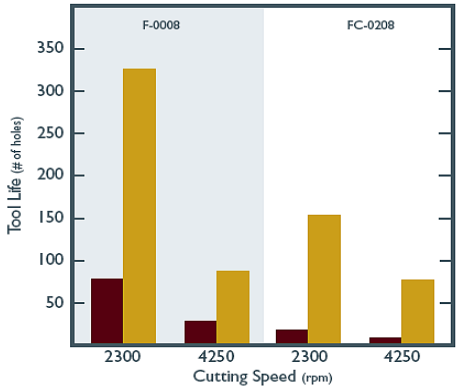
Drilling Thrust Force



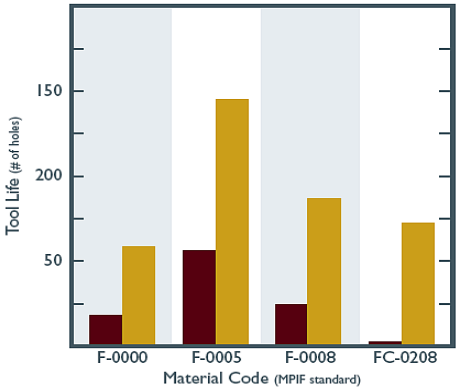
TOOL LIFE COMPARISONS

ATOMET 29M compared to **ATOMET 29**.
Sintered in a rich endothermic atmosphere at 1120ºC (2050ºF) for 30 minutes.

Effect of Cutting Speed



Effect of Material Composition
(Cutting Speed 4250 rpm)



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