

ATOMET 4201

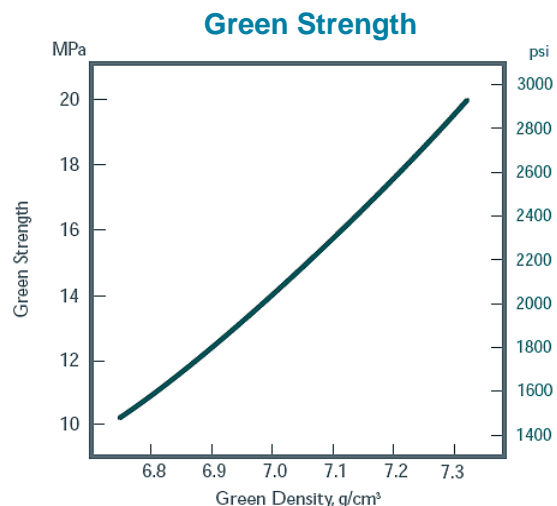
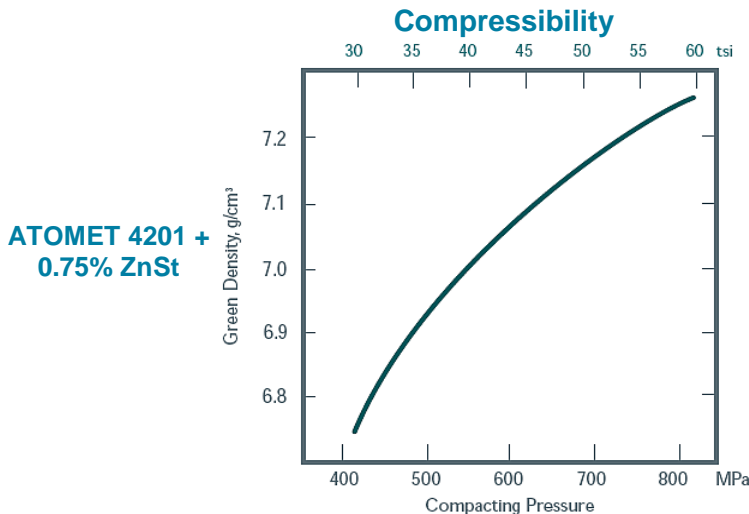
ATOMET 4201 is a highly compressible, water-atomized low alloy steel powder containing 0.45% nickel and 0.60% molybdenum, designed for high performance, high strength powder metallurgy and powder forging applications.

- **Hardenability - ATOMET 4201**, containing a precise level of manganese, nickel and molybdenum, is an ideal choice for powder metallurgy (PM) and powder forging (PF) applications that require consistent and superior heat-treated properties.
 - Improves hardness and tensile strength
- **Dimensional change - ATOMET 4201** can be used with existing tooling designed for conventional AISI 4200 prealloyed powders.
 - No need to retool
- **Consistency** - a stable ore base, modern steelmaking practices and statistically controlled powder manufacturing ensure lot-to-lot consistency. Being a homogeneous alloy, **ATOMET 4201** eliminates the detrimental effects of segregation and dusting normally associated with elemental blends.
 - Low variation of part properties
 - Compatible with work environment requirements
- **Compressibility** - the outstanding compressibility of **ATOMET 4201** extends the benefits of prealloyed powders to high density applications above 6.9 g/cm³.
 - Reduces tool stress
 - Improves strength
- **Purity and cleanliness** - state-of-the-art clean steel practice ensures low residuals and sets new standards for cleanliness.
 - Improves mechanical and dynamic properties

PHYSICAL AND CHEMICAL PROPERTIES

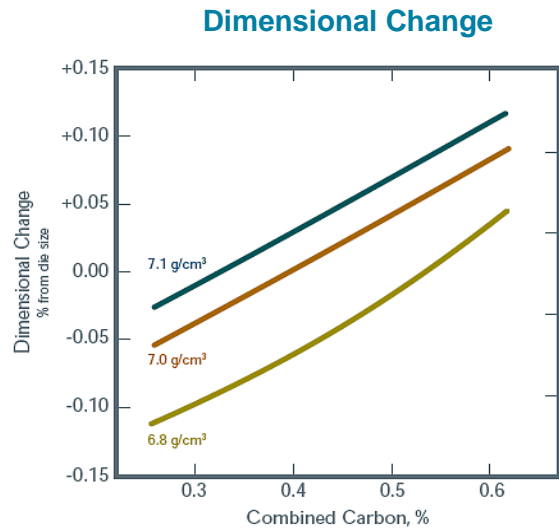
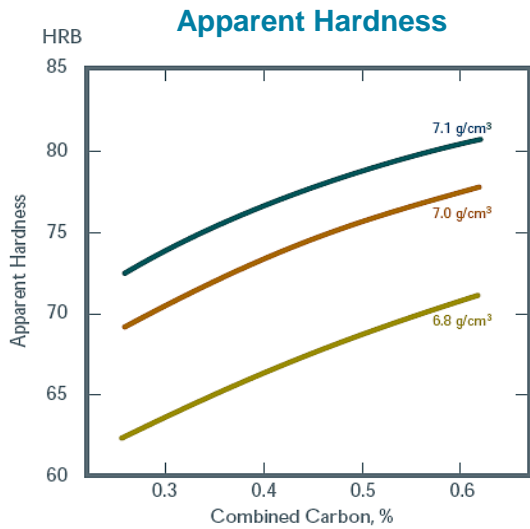
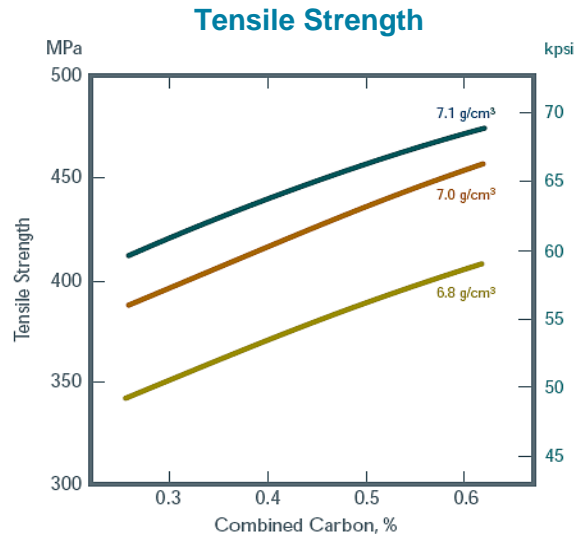
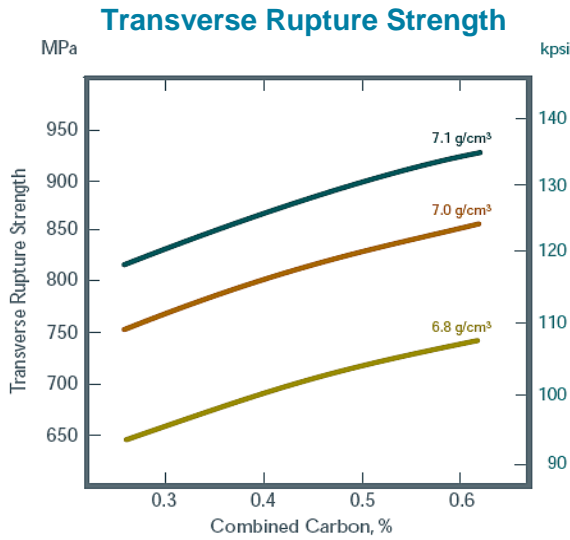
Chemistry, wt%						Particle Size Analysis, wt%				A.D.	Flow	Density*	
C	O	S	Mn	Mo	Ni	U.S. mesh	+60	+100	+325	-325	g/cm ³	s/50g	g/cm ³
0.003	0.08	0.009	0.15	0.85	0.45	μm	+250	+150	+45	-45	2.92	26	7.05
							Trace	10	65	25			*@43.5 tsi @600 MPa

COMPACTING PROPERTIES



SINTERED PROPERTIES - Carbon Steels

Composition: **ATOMET 4201** + graphite + 0.5% ZnSt
 Sintered in a rich endothermic atmosphere at 1120°C (2050°F) for 30 minutes.



Material Designation Code	Green Density	Added Graphite	Combined Carbon Range	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Tensile Strength		Yield Strength		Elongation
MPIF Std 35	g/cm ³	%	%	MPa	kpsi	HRC (HRB)	%	MPa	kpsi	MPa	kpsi	%
FL-4203	6.80	0.30	0.29-0.35	600	95	(63)	-0.10	370	53	290	42	3.4
	7.00	0.30	0.29-0.35	760	110	(70)	-0.05	410	60	320	47	3.6
	7.10	0.30	0.29-0.35	820	119	(73)	-0.02	430	63	340	49	3.7
FL-4205	6.80	0.50	0.46-0.52	720	104	(69)	-0.02	390	57	320	47	2.3
	7.00	0.50	0.46-0.52	830	120	(75)	0.04	440	64	360	52	2.5
	7.10	0.50	0.46-0.52	900	130	(79)	0.06	460	66	370	54	2.6
FL-4207	6.80	0.70	0.62-0.68	750	109	(72)	0.05	420	61	350	51	1.0
	7.00	0.70	0.62-0.68	870	126	(78)	0.09	460	67	390	56	1.3
	7.10	0.70	0.62-0.68	940	136	(81)	0.12	480	70	400	58	1.4
FL-4203-HT	6.80	0.30	0.29-0.35	1450	210	29	-	690	100	-	-	-
	7.00	0.30	0.29-0.35	1700	248	34	-	790	114	-	-	-
	7.10	0.30	0.29-0.35	1880	272	36	-	850	123	-	-	-
FL-4205-HT	6.80	0.50	0.46-0.52	1490	216	34	-	770	111	-	-	-
	7.00	0.50	0.46-0.52	1780	258	38	-	890	129	-	-	-
	7.10	0.50	0.46-0.52	1930	280	40	-	980	142	-	-	-

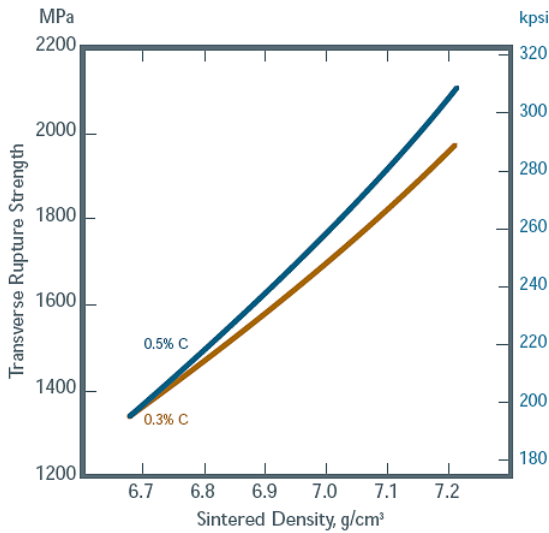
HEAT-TREATED PROPERTIES - Carbon Steels

Composition: **ATOMET 4201** + graphite + 0.5% ZnSt

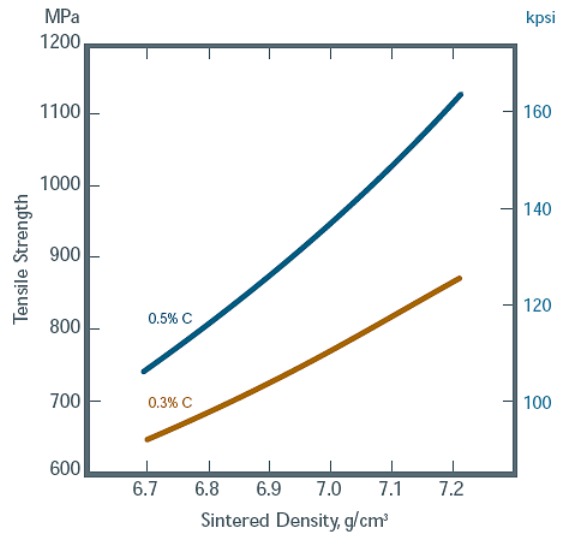
Sintered in a rich endothermic atmosphere at 1120°C (2050°F) for 30 minutes.

Heat-treated 15 minutes at 845°C (1550°F), atmosphere with 0.8% carbon potential, oil quenched 50°C, tempered 1 hour at 185°C (365°F).

Transverse Rupture Strength

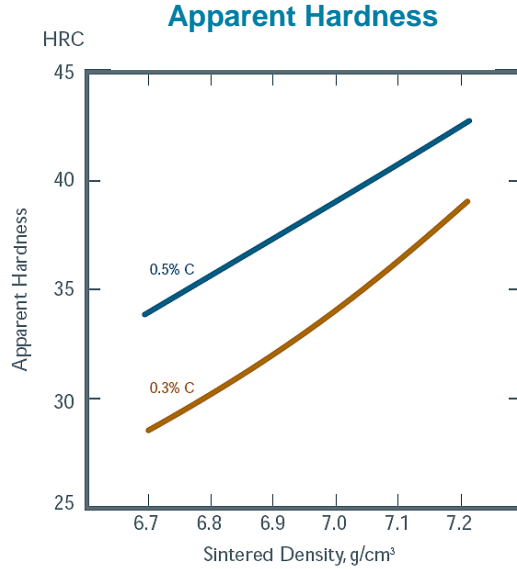


Tensile Strength



HEAT-TREATED PROPERTIES (continued) - Carbon Steels

Composition: **ATOMET 4201** + graphite + 0.5% ZnSt
 Sintered in a rich endothermic atmosphere at 1120°C (2050°F) for 30 minutes.
 Heat-treated 15 minutes at 845°C (1550°F), atmosphere with 0.8% carbon potential.
 Oil quenched at 50°C (125°F), tempered 1 hour at 185°C (365°F).



METALLOGRAPHIC ANALYSIS

ATOMET 4201, with the lowest level of non-metallic inclusions, is an ideal choice for fully dense applications which demand exceptional mechanical and dynamic properties.

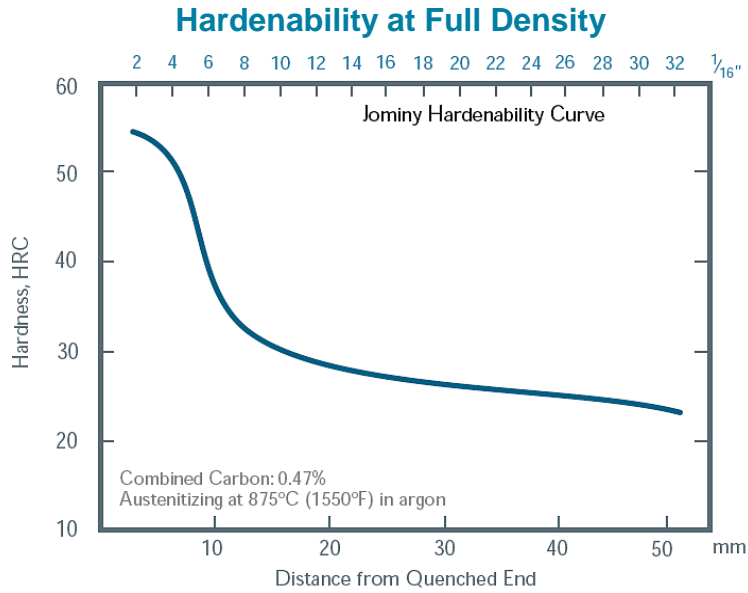
Cleanliness

A) Total surface area of inclusions: **0.006%**

B) Inclusions count:

Length µm	Number/ 100mm ²
30/50	4.0
50/100	0.7
100/150	0.1
>150	0.0

I. Unalloyed Iron: 0.5%



Rio Tinto Metal Powders
 1655 Route Marie-Victorin
 Sorel-Tracy, Quebec J3R 4R4
 Canada
 T + 1 450 746 5050
 F + 1 450 743 0223