

**ATOMET 29** is a very high strength, highly-compressible iron powder designed for medium density P/M applications.

- **Compressibility - ATOMET 29** can be single pressed to densities up to 7.0 g/cm<sup>3</sup>.
  - Higher strength, higher density parts extend the performance range of sponge iron applications.
- **High green strength - ATOMET 29 assures powder performs of good structural integrity.**
  - Improves thin section integrity and facilitates green parts handling.
- **Low growth characteristics - the high purity and large specific surface area of ATOMET 29 allows for rapid sintering and greater dimensional control.**
  - Reduces sintered dimensional variation.
  - Improves dimensional control of copper infiltrated parts and blends containing copper.
- **Consistency - a stable ore base and statistically controlled manufacturing process assure lot-to-lot consistency.**
  - Improves P/M part consistency.

## PHYSICAL AND CHEMICAL PROPERTIES

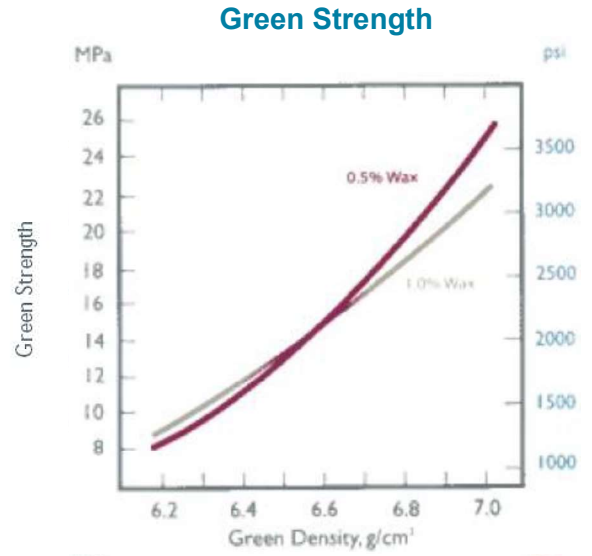
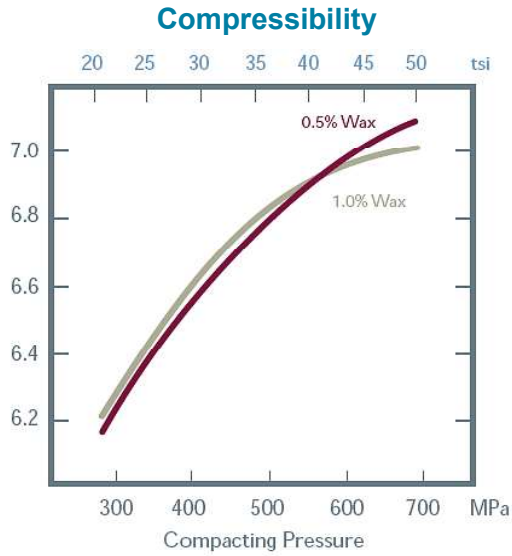
**Chemistry, wt%**

<b>C</b>	<b>O</b>	<b>S</b>	<b>Mn</b>	<b>P</b>	<b>Fe</b>
0.05	0.17	0.006	0.008	0.025	99,4+

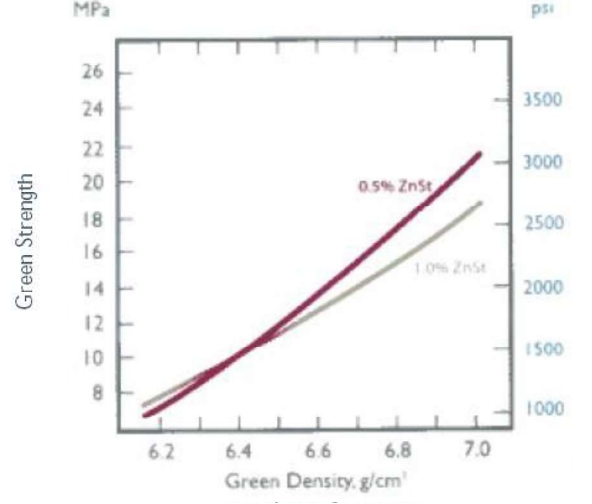
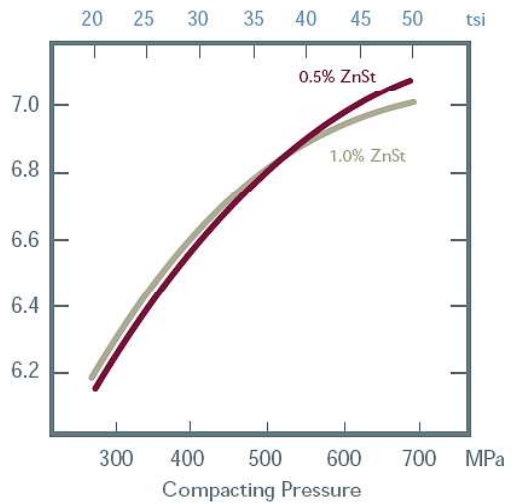
	<b>Particle Size Analysis, wt%</b>				<b>A.D.</b>	<b>Flow</b>	<b>Density*</b>
<b>U.S. mesh</b>	+60	+100	+325	-325	<b>g/cm<sup>3</sup></b>	<b>s/50g</b>	<b>g/cm<sup>3</sup></b>
μm	+250	+150	+45	-45	2.93	26	6.95
	Trace	5	73	22			*@43.5 tsi @600 MPa

COMPACTING PROPERTIES

ATOMET 29  
+ Wax



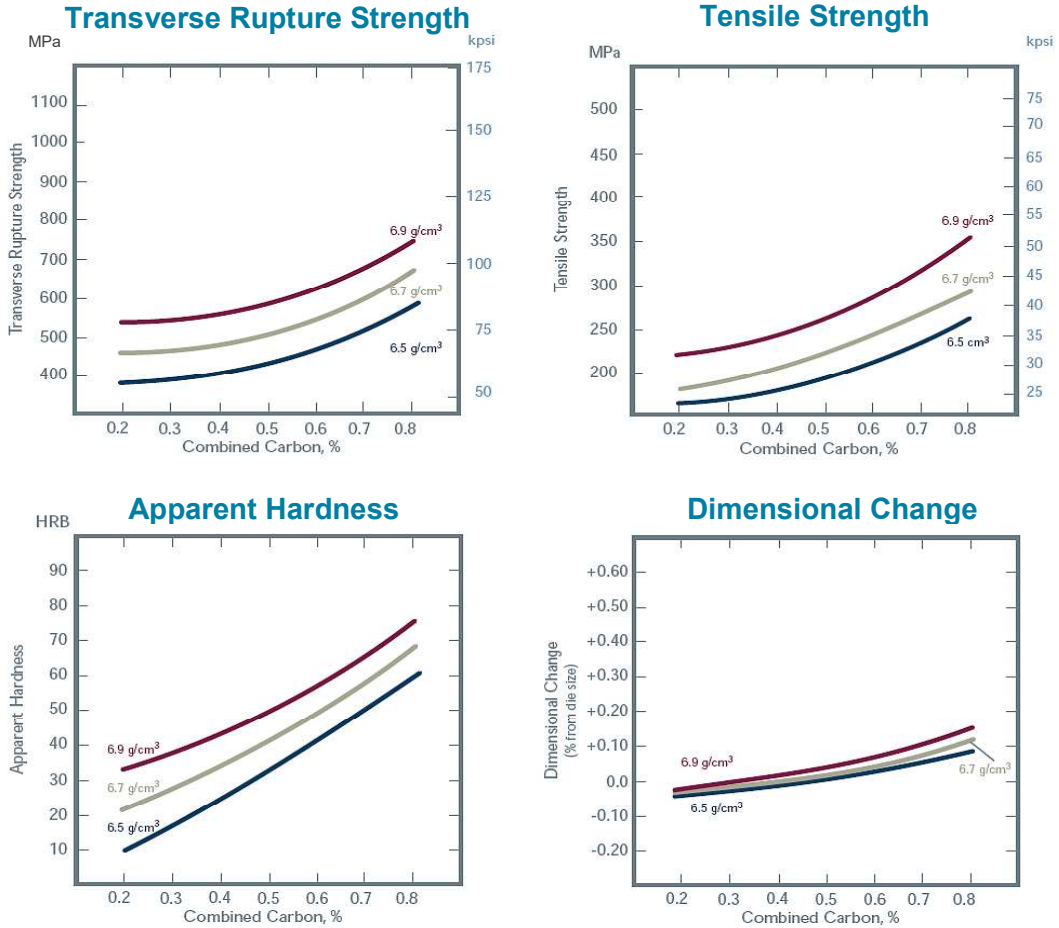
ATOMET 29  
+ ZnSt



## AS-SINTERED PROPERTIES - Carbon Steels

Composition: **ATOMET 29** + graphite + 0.75% ZnSt.

Sintered in a nitrogen-based atmosphere at 1120°C (2050°F) for 30 minutes.

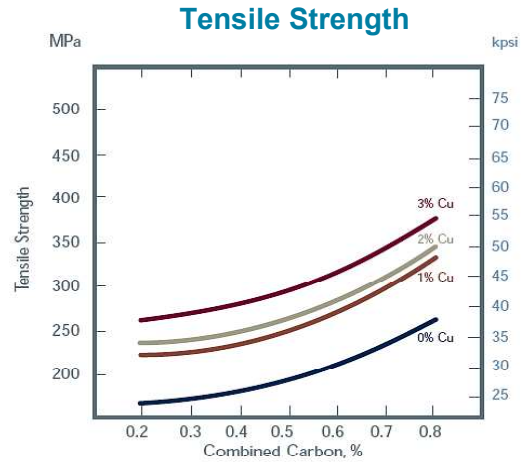
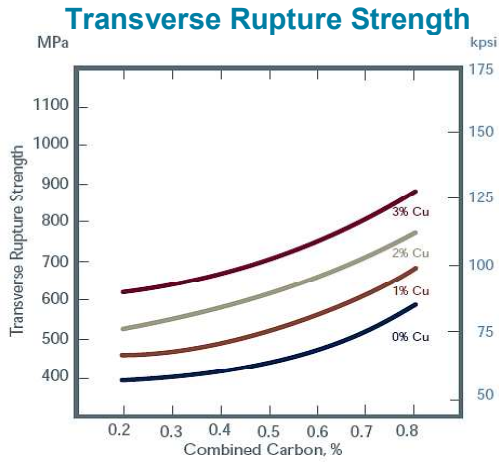


Material Designation Code	Sintered Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Tensile Strength		Yield Strength		Elongation	
				MPa	kpsi			MPa	kpsi	MPa	kpsi		%
MPIF Std 35	g/cm <sup>3</sup>	%	%	MPa	kpsi	HRB	%	MPa	kpsi	MPa	kpsi	%	
	F-0000	6.50	0.30	0.18	390	57	9	-0.04	170	24	130	19	1.8
		6.70	0.30	0.18	470	68	21	-0.03	180	26	140	21	2.0
F-0005		6.90	0.30	0.18	540	79	33	-0.02	220	32	170	24	2.8
		6.50	0.60	0.50	440	64	34	0.01	190	28	170	25	<1.0
		6.70	0.60	0.50	520	75	42	0.03	220	32	190	28	1.0
F-0008		6.90	0.60	0.50	590	86	51	0.05	260	38	220	32	1.5
		6.50	0.90	0.74	540	79	55	0.07	240	35	220	32	<1.0
		6.70	0.90	0.74	630	92	63	0.09	280	40	250	36	<1.0
	6.90	0.90	0.74	700	102	70	0.13	330	48	290	42	1.0	

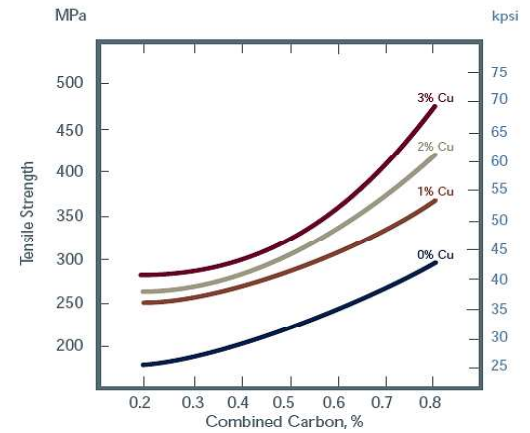
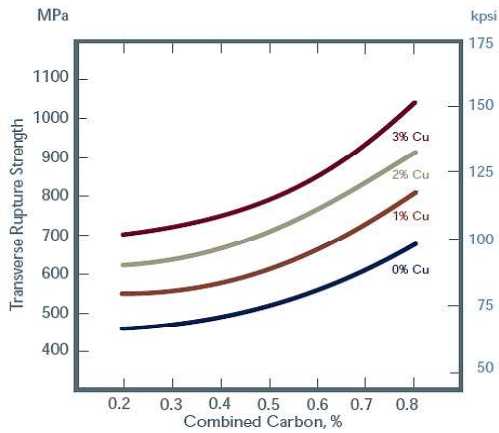
AS-SINTERED PROPERTIES - Carbon Steels

Composition: **ATOMET 29** + copper + graphite + 0.75% ZnSt.  
 Sintered in rich endothermic atmosphere at 1120°C (2050°F) for 30 minutes.

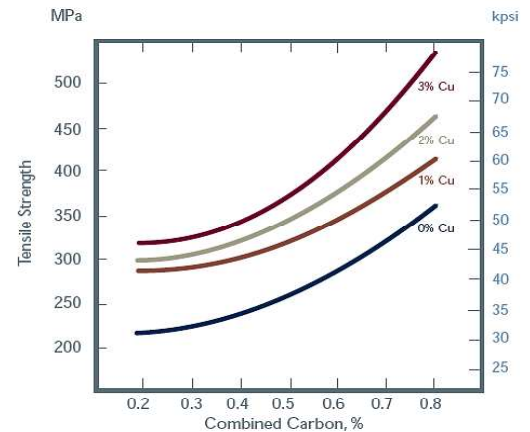
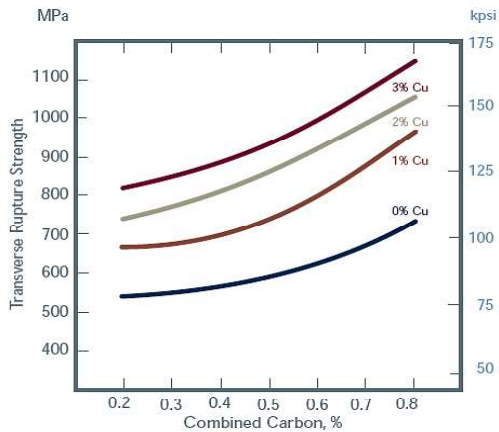
Sintered Density  
 6.5 g/cm<sup>3</sup>



Sintered Density  
 6.7 g/cm<sup>3</sup>



Sintered Density  
 6.9 g/cm<sup>3</sup>

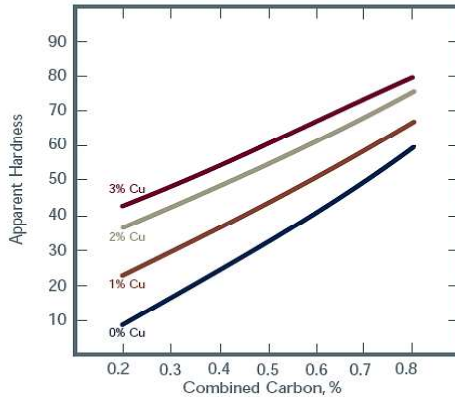


AS-SINTERED PROPERTIES (continued) - Copper Steels

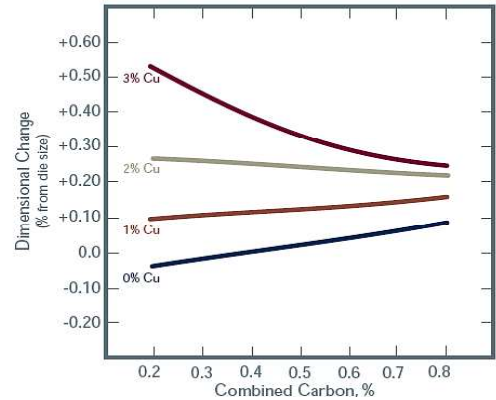
Composition: **ATOMET 29** + copper + graphite + 0.75% ZnSt.  
 Sintered in a nitrogen-based atmosphere at 1120°C (2050°F) for 30 minutes.

Sintered Density  
 6.5 g/cm<sup>3</sup>

Apparent Hardness

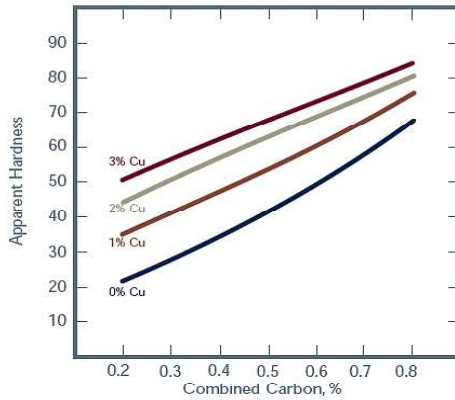


Dimensional Change

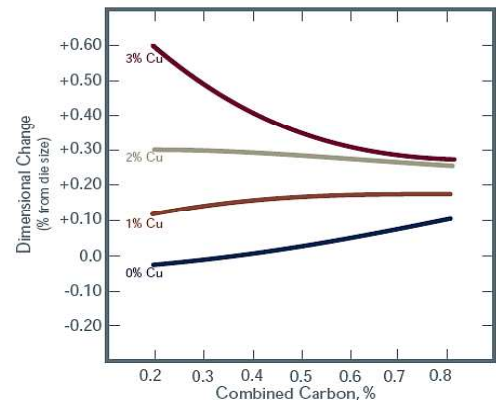


Sintered Density  
 6.7 g/cm<sup>3</sup>

HRB

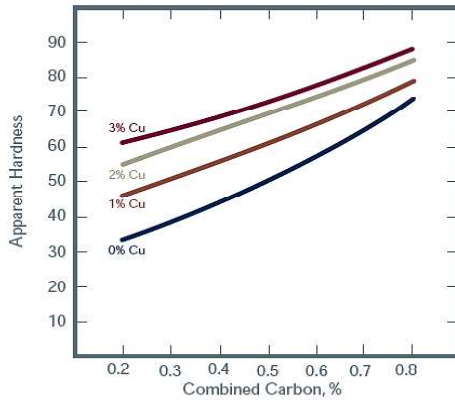


%

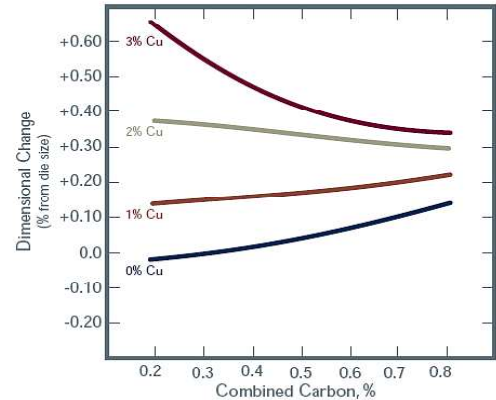


Sintered Density  
 6.9 g/cm<sup>3</sup>

HRB



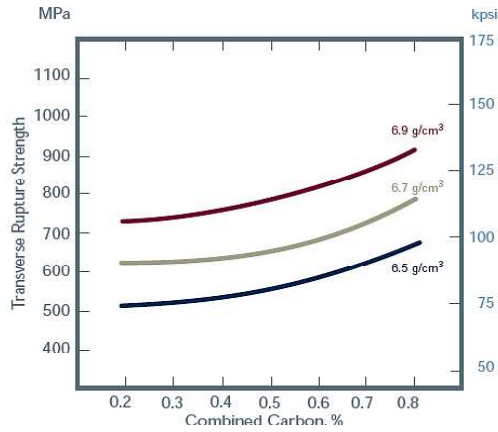
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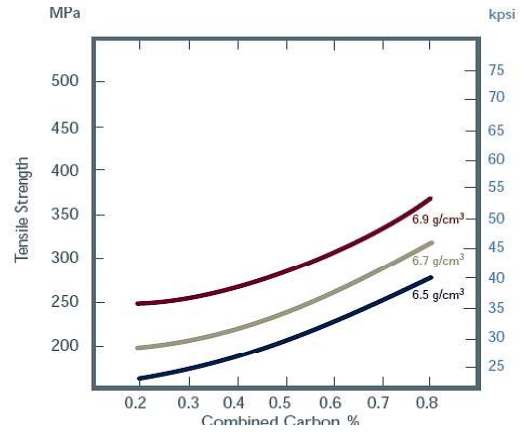
**AS-SINTERED PROPERTIES - Nickel Steels**

Composition: **ATOMET 29** + 2% nickel + graphite + 0.75% ZnSt.  
 Sintered in a nitrogen-based atmosphere at 1120°C (2050°F) for 30 minutes.

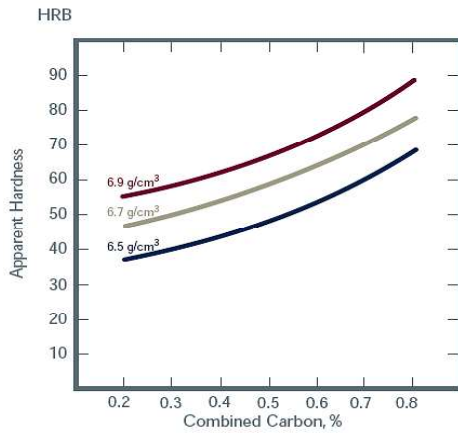
**Transverse Rupture Strength**



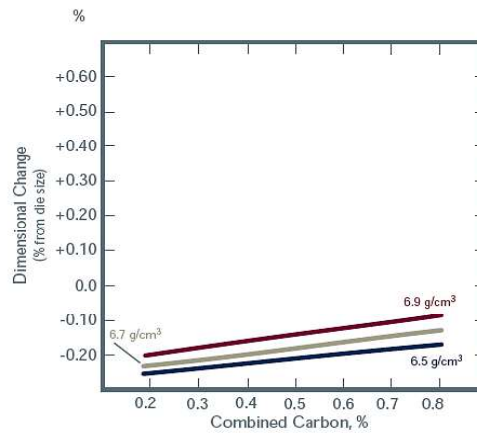
**Tensile Strength**



**Apparent Hardness**



**Dimensional Change**



Material Designation Code	Sintered Density g/cm <sup>3</sup>	Added Graphite %	Combined Carbon %	Transverse Rupture Strength		Apparent Hardness HRB	Dimensional Change %	Tensile Strength		Yield Strength		Elongation %
				MPa	kpsi			MPa	kpsi	MPa	kpsi	
MPIF Std 35 FN-0200	6.50	0.30	0.20	520	75	38	-0.25	170	24	120	18	1.2
	6.70	0.30	0.20	620	90	48	-0.22	200	29	140	21	1.7
	6.90	0.80	0.20	730	106	56	-0.20	250	36	170	24	2.4
FN-0205	6.50	0.60	0.48	550	80	48	-0.21	210	30	170	24	<1.0
	6.70	0.60	0.48	660	95	58	-0.18	230	34	180	26	1.2
	6.90	0.60	0.48	770	112	66	-0.15	280	40	200	29	1.5
FN-0208	6.50	0.90	0.74	630	92	64	-0.18	260	38	210	31	<1.0
	6.70	0.90	0.74	740	108	73	-0.14	300	43	250	36	<1.0
	6.90	0.90	0.74	880	127	84	-0.10	340	50	280	40	<1.0

## AS-SINTERED PROPERTIES - Copper Steels

Composition: **ATOMET 29** + 2% copper + graphite + 0.75% ZnSt.  
Sintered in a nitrogen-based atmosphere at 1120°C (2050°F) for 30 minutes.

Material Designation Code	Sintered Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Tensile Strength		Yield Strength		Elongation
				MPa	kpsi			MPa	kpsi	MPa	kpsi	
MPIF Std 35	g/cm <sup>3</sup>	%	%	MPa	kpsi	HRB	%	MPa	kpsi	MPa	kpsi	%
FC-0200	6.50	0.30	0.20	520	76	38	0.27	230	34	210	30	1.0
	6.70	0.30	0.20	620	90	45	0.30	260	38	230	34	1.0
	6.90	0.30	0.20	740	107	56	0.38	300	44	270	39	1.5
FC-0205	6.50	0.60	0.50	610	89	57	0.25	260	38	260	37	<1.0
	6.70	0.60	0.50	710	103	64	0.29	300	44	280	41	<1.0
	6.90	0.60	0.50	870	126	70	0.34	340	50	320	47	<1.0
FC-0208	6.50	0.90	0.78	740	108	72	0.22	330	48	290	42	<1.0
	6.70	0.90	0.78	880	127	78	0.26	400	58	360	52	<1.0
	6.90	0.90	0.78	1030	150	82	0.30	440	64	410	59	<1.0

## AS-SINTERED PROPERTIES - Nickel-Copper Steels

Composition: **ATOMET 29** + 2% nickel + 2% copper + graphite + 0.75% ZnSt.  
Sintered in a nitrogen-based atmosphere at 1120°C (2050°F) for 30 minutes.

Material Designation Code	Sintered Density	Added Graphite	Combined Carbon	Transverse Rupture Strength		Apparent Hardness	Dimensional Change	Tensile Strength		Yield Strength		Elongation
				MPa	kpsi			MPa	kpsi	MPa	kpsi	
MPIF Std 35	g/cm <sup>3</sup>	%	%	MPa	kpsi	HRB	%	MPa	kpsi	MPa	kpsi	%
FN-0205	6.50	0.60	0.49	740	108	69	0.16	310	45	260	38	<1.0
	6.70	0.60	0.49	860	124	75	0.22	340	50	280	41	<1.0
	6.90	0.60	0.49	960	139	82	0.30	400	58	320	46	1.0

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