

SM1001 is an ultra-pure steel powder designed for soft magnetic P/M applications.

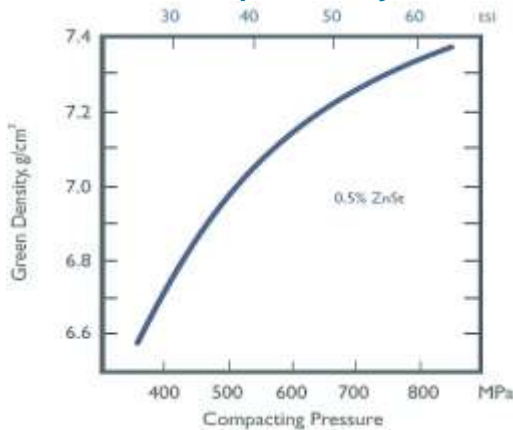
- **High purity** – SM1001 contains exceptionally low levels of carbon, oxygen, sulfur and manganese.
 - High magnetic permeability
 - High induced magnetization
 - Low coercive force
- **Cleanliness**- high purity and virgin raw materials inherently containing low residual elements coupled with clean steel practices sets a new standard for powder cleanliness.
 - High magnetic permeability
 - High induced magnetization
 - Low coercive force
- **Consistency**- statistical process control, pure raw materials and the use of modern steel-making practices ensure product homogeneity and lot-to-lot consistency.
 - Improved P/M part consistency
- **Compressibility**- single pressed density up to 7.2 g/cm³ can be achieved with SM1001 making it an ideal choice for high density P/M magnetic parts.
 - Reduces tool stress
 - Superior magnetic properties

PHYSICAL AND CHEMICAL PROPERTIES

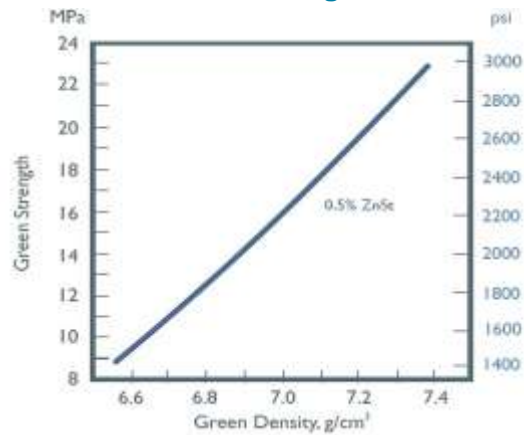
Chemistry, wt %					Particle Size Analysis,				A.D.	Flow	Density*	
C	O	S	Mn	Fe	U.S. mesh	+60	+100	+325	-325	g/cm ³	sec/50g	g/cm ³
0,004	0,06	0,009	0,04	99,4+	µm	+250	+150	+45	-45	2,92	25	7,20
						Trace	14	66	20			*@43,5 tsi @600 Mpa

COMPACTING PROPERTIES

Compressibility



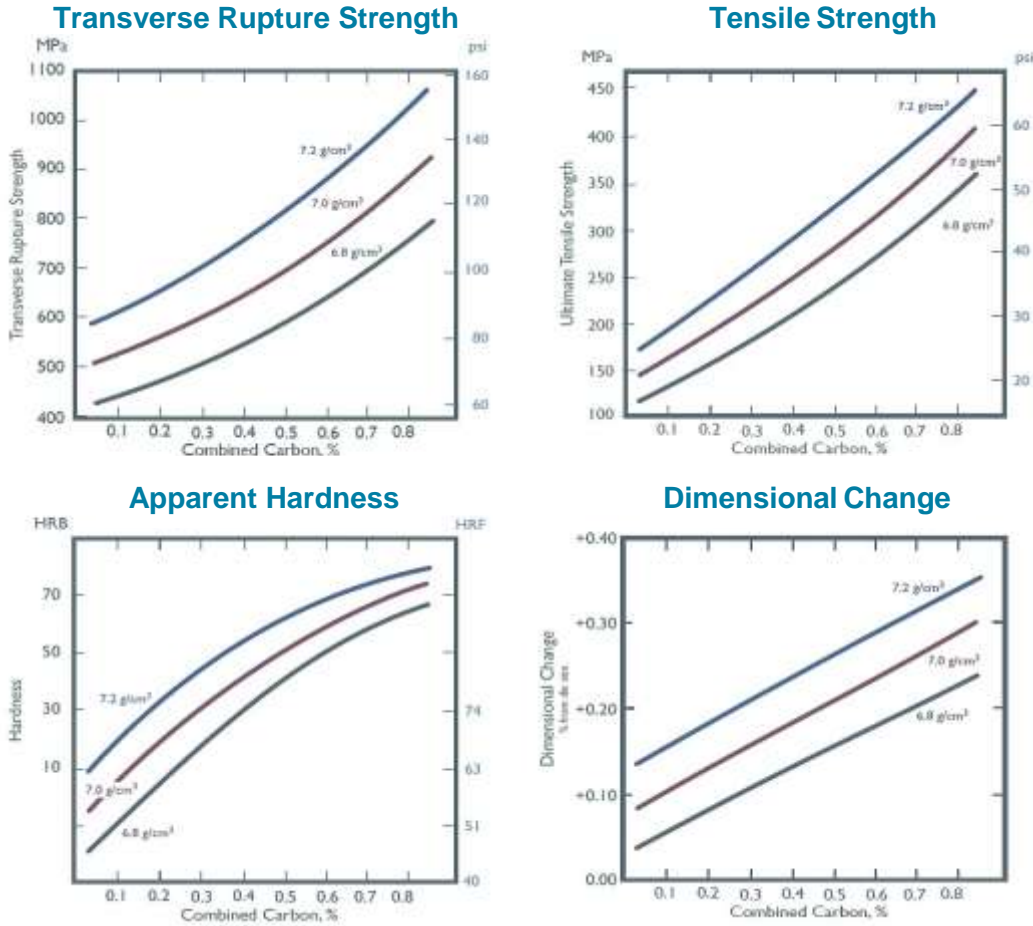
Green Strength



SM1001 +Wax

AS-SINTERED PROPERTIES- Carbon Steels

Composition: **SM1001** + graphite + 0.5% ZnSt
 Sintered in a rich endothermic atmosphere at 1120°C (2050°F) for 30 minutes.

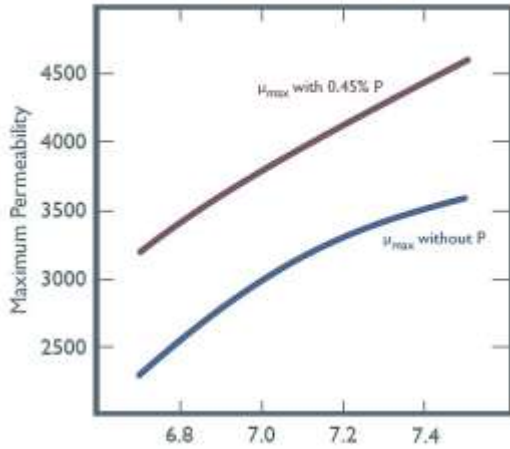


Material designation Code	Green density g/cm^3	Added Graphite %	Combined Carbon %	Transverse Rupture Strength		Apparent hardness HRB (HRF)	Dimensional change %	Combined Carbon %	Tensile Strength		Yield Strength (2% offset)		Elongation %
				MPa	1000 psi				MPa	1000 psi	MPa	1000 psi	
F-0000	6.8	0	0.05	425	61.8	(48)	+0.05	0.06	120	17.6	90	13.2	7.4
	7.0	0	0.04	505	73.4	(55)	+0.09	0.04	145	20.9	90	13.2	10.3
	7.2	0	0.03	580	84.3	9	+0.14	0.03	170	24.4	95	14.0	13.1
F-0000	6.8	0.3	0.31	505	73.0	19	+0.11	0.34	185	27.2	160	22.8	3.9
	7.0	0.3	0.30	590	85.5	30	+0.15	0.32	220	31.7	170	24.9	6.0
	7.2	0.3	0.29	690	100.0	42	+0.20	0.31	255	36.9	185	26.9	7.9
F-0005	6.8	0.5	0.49	575	83.3	39	+0.15	0.51	235	34.4	175	25.2	3.6
	7.0	0.5	0.48	670	97.5	49	+0.20	0.51	280	40.4	185	27.2	5.0
	7.2	0.5	0.47	790	114.3	59	+0.25	0.50	320	46.0	200	29.2	6.5

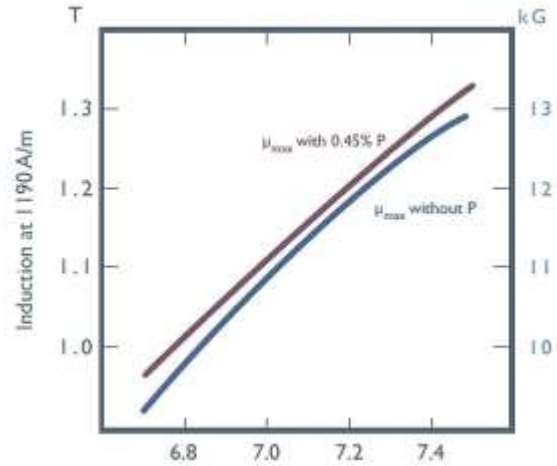
AS-SINTERED MAGNETIC PROPERTIES- Fe and Fe-0.45%P

Sintered in a hydrogen based atmosphere at 1120°C (2050°F) for 60 minutes.

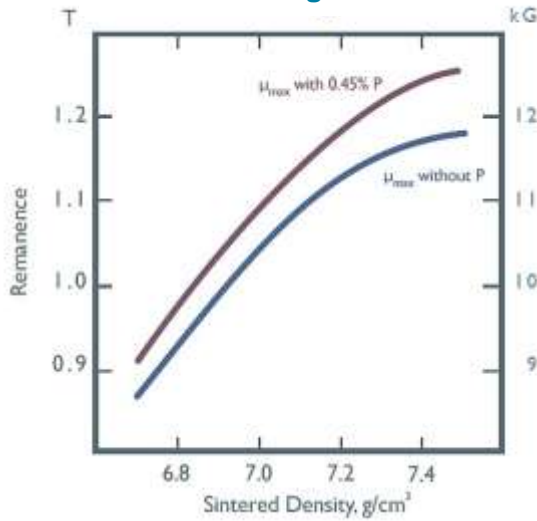
Permeability



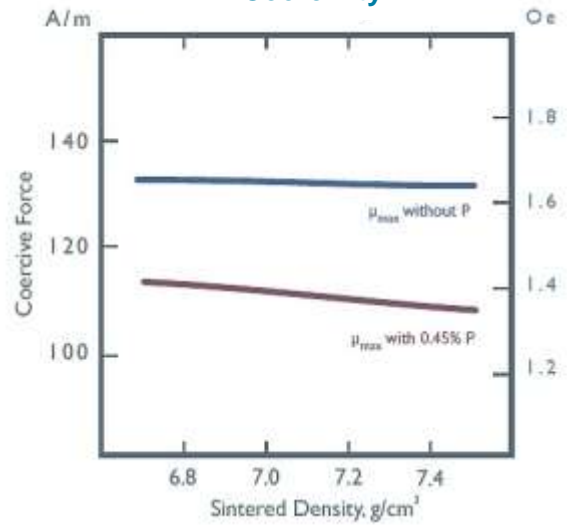
Induction



Remanent Magnetization



Coercivity



TYPICAL MAGNETIC PROPERTIES

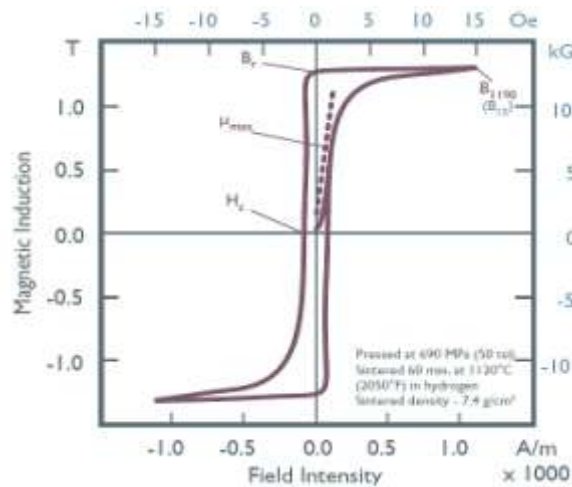
SM1001 + 0.5% Glyco PM100

Sintered Density g/cm^3	Sintering Temperatur		Induction at 1190 A/m		Remanenc e Br		Maximum Permeability μ_{max}	Coercive Force	
	$^{\circ}C$	$(^{\circ}F)$	T (kG)	T (kG)	T (kG)	T (kG)		A/m	(Oe)
6.8	1120	2050	0.98	9.8	0.93	9.3	2560	132.14	1.66
7.0	1120	2050	1.09	10.9	1.04	10.4	2975	131.34	1.65
7.2	1120	2050	1.18	11.8	1.13	11.3	3285	131.34	1.65
7.4	1120	2050	1.26	12.6	1.17	11.7	3500	130.54	1.64
	1160	2030	1.26	12.6	1.20	12.0	3600	119.40	1.50
7.6	1120	2050	1.32	13.2	1.18	11.8	3605	130.54	1.64
	1160	2030	----	----	----	----	----	----	----

SM1001 + 0.45% P + 0.5% Glyco PM100

g/cm^3	$^{\circ}C$		T (kG)		T (kG)		μ_{max}	A/m (Oe)	
	$^{\circ}C$	$(^{\circ}F)$	T (kG)	T (kG)	T (kG)	T (kG)		A/m	(Oe)
6.8	1120	2050	1.02	10.2	0.97	9.7	3395	112.24	1.41
7.0	1120	2050	1.11	11.1	1.08	10.8	3780	110.64	1.39
7.2	1120	2050	1.2	12.0	1.18	11.8	4130	109.05	1.37
7.4	1120	2050	1.29	12.9	1.24	12.4	4445	107.46	1.35
	1160	2030	1.32	13.2	1.28	12.8	5000	95.52	1.20
7.6	1120	2050	1.37	13.7	1.24	12.4	4720	105.87	1.33
	1160	2030	1.37	13.7	1.30	13.0	6300	71.64	0.90

Hysteresis Curve



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