MATERIALS FOR PARTICLE ACCELERATORS

Materials and relevant values

PARAMETER	8C11	8C12	4M2	4E2	4B3
μ_i (±20%)	1200	900	140	25	300
μ_{rem} approx.	850	600	130	20	–
B_S 25 °C (mT, 800 A/m)	≥300	280	250	250	≥300
B_S 40 °C (mT, 800 A/m)	≥280	250	220	220	–
H_c (A/m, after 800 A/m)	≤20	30	100	500	<80
ρ DC (Ωm)	$>10^5$	$>10^5$	$>10^5$	$>10^5$	$>10^5$
T_C (°C)	≥125	≥125	≥150	≥400	≥250
μQ in remanence 200 kHz:					
10 mT		15×10^3			
20 mT		9×10^3			
50 mT		4×10^3			
μQ in remanence 500 kHz:					
10 mT		10×10^3			
20 mT		6×10^3			
50 mT		25×10^3			
μQ in remanence 1 MHz:					
5 mT		10×10^3	20×10^3		
10 mT		75×10^3	20×10^3		
20 mT		5×10^3	15×10^3		
30 mT		–	8×10^3		
μQ in remanence 2.5 MHz:					
5 mT			20×10^3		
10 mT			20×10^3		
20 mT			15×10^3		
30 mT			7×10^3		
μQ in remanence 5 MHz:					
5 mT			15×10^3		
10 mT			15×10^3		
20 mT			10×10^3		
30 mT			7×10^3		
μQ in remanence 10 MHz:					
5 mT			12×10^3		
10 mT			10×10^3		
μQ in remanence 80 MHz:					
1 mT				2.5×10^3	
μQ in remanence 100 MHz				2×10^3	
Decrease in μQ (%), measured 10 ms after application of DC bias (approx.)		10	15	30	
μ_Δ with DC bias field (approx.):					
0 A/m		600	130		
250 A/m		120	80		
500 A/m		50	40		
1000 A/m		22	22		
2000 A/m		8	12		
3000 A/m		5.5	8		
Frequency range (with or without DC bias) in MHz		up to 2	2 to 10	20 to 100	
Application area and special features	kicker magnets; high resistance	high frequency ratio possible with DC bias	fast recovery after magnetic bias	high frequency material	high ($B_S + B_r$)