

GENERAL MATERIAL PROPERTIES FOR RF MATERIALS

Material Mix No.	Basic Iron powder	Material Permeability ( $\mu_0$ )	Temperature <sup>1</sup> Stability (+ppm/C <sup>o</sup> )	Relative Cost	Toroidal Color Code
-1	Carbonyl C	20	280	2.7	Blue/Clear
-2	Carbonyl E	10	95	1.7	Red/Clear
-3	Carbonyl HP	35	370	2.5	Gray/Clear
-4	Carbonyl J	9.0	280	2.0	Blue/White
-6	Carbonyl SF	8.5	35	2.0	Yellow/Clear
-7	Carbonyl TH	9.0	30	2.0	White/Clear
-8	Carbonyl GQ4	35	255	2.5	Orange/Clear
-10	Carbonyl W	6.0	150	4.7	Black/Clear
-12*	Synthetic Oxide	4.0	170**	1.5	Green/White
-15	Carbonyl GS6	25	190	3.1	Red/White
-17	Carbonyl	4.0	50	3.1	Blue/Yellow
-42	Hydrogen Reduced	40	550	1.4	Blue/Red
-0	Phenolic	1	0	1.0	Tan/Tan

<sup>1</sup>Temperature stability values, averaged from -55°C to +125°C, are listed for closed magnetic structures.

\* Non-linear

\*\* Mix 17 was developed as a temperature stable alternative to mix 12 and is recommended for all new designs.

Note: For information on Mix #'s 8, 14, 18, 26, 30, 34, 35, 38, 40, 45 and 52 see Micrometals Catalog for Power Conversion and Line Filter Applications.

RESONANT CIRCUIT\* ( — ) AND BROADBAND FREQUENCY RANGE ( - - - )

Mix #	Range (MHz)	2KHz to 50KHz	50KHz to 250KHz	250KHz to 500KHz	500KHz to 2MHz	2MHz to 10MHz	10MHz to 40MHz	40MHz to 150MHz	150MHz to 250MHz	250MHz to 500MHz	500MHz to 1GHz
42	.03-.80	—									
3	.02-1	—	—								
8	.02-1	—	—	—							
1	.15-3		—	—	—						
15	.15-3		—	—	—						
2	.25-10			—	—	—			—		
7	1-25				—	—	—				
4	3-40					—	—	—			
6	3-40					—	—	—	—		
10	15-100						—	—		—	
17	20-200						—	—			
12	30-250						—	—			
0	50-350							—	—	—	—

\*Resonant frequency range is given to optimize Q and core loss.

Materials can be used outside resonant frequency range where optimum Q is not required.

TYPICAL APPLICATIONS

**-2, -4, -6, -7 Materials:** These are the most popular carbonyl irons. They will provide high Q up to 40 MHz and are the most popular materials for amateur radio and a variety of other communication applications. They are also useful for moderate band transformers in the 200 to 400 MHz frequency range.

**-1, -3, -8, -15 Materials:** These materials are annealed carbonyl irons providing the highest carbonyl permeability. They are useful for high Q applications below 1 MHz. They will provide the broadest band transformers covering a typical range from 50 to 500 MHz.

**-10, -17 Materials:** These materials are the highest frequency carbonyl irons. They will provide high Q up to 150 MHz and are a popular material for cable television applications. They will produce moderate band transformers typically covering 400 to 700 MHz.

**-0 Material:** This is a non-magnetic material. It provides a solid form for winding air coils. It has excellent temperature stability and will provide high Q up to the highest frequencies. It is also useful for moderate band transformer applications covering a typical range from 600 to 1000 MHz.

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MICROMETALS