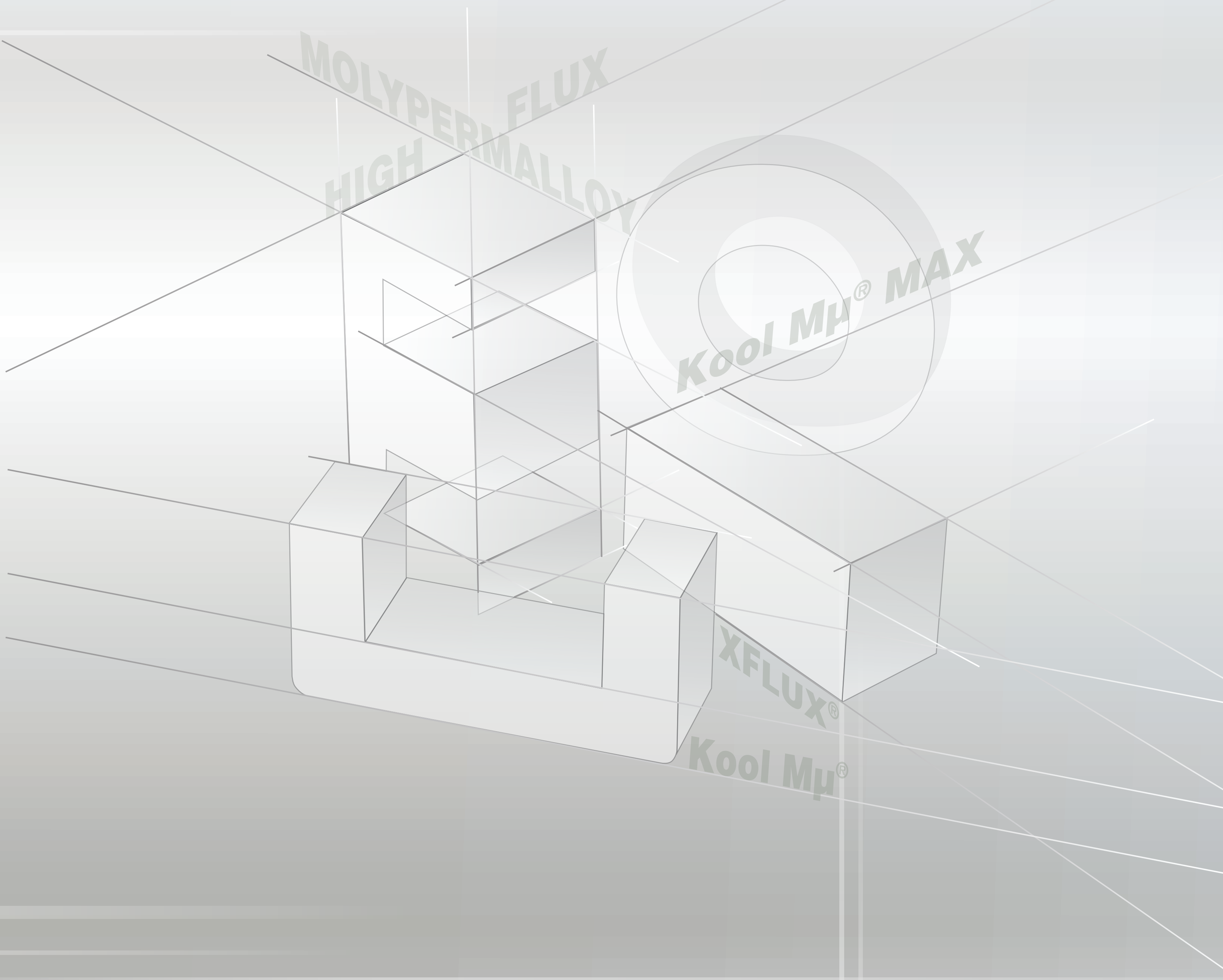
MAGNETICS®

POWDER CORES

Molypermalloy | High Flux | Kool Mµ® | XFLUX® | Kool Mµ® MAX



We offer the confidence of over sixty years of expertise in the research, design, manufacture and support of high quality magnetic materials and components.

A major manufacturer of the highest performance materials in the industry including: MPP, High Flux, Kool Mµ®, Kool Mµ® MAX, XFlux®, power ferrites, high permeability ferrites and strip wound cores, Magnetics' products set the standard for providing consistent and reliable electrical properties for a comprehensive range of core materials and geometries. Magnetics is the best choice for a variety of applications ranging from simple chokes and transformers used in telecommunications equipment to sophisticated devices for aerospace electronics.

Magnetics backs it products with unsurpassed technical expertise and customer service. Magnetics' Sales Engineers offer the experience necessary to assist the designer from the initial design phase through prototype approval. Knowledgeable Sales Managers provide dedicated account management. Skilled Customer Service Representatives are easily accessible to provide exceptional sales support. This support, combined with a global presence via a worldwide distribution network, including a Hong Kong distribution center, makes Magnetics a superior supplier to the international electronics industry.

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Core Locator & Unit Pack Quantity

MPP Toroids

P/N	PAGE	BOX QTY
55014	61	10,000
55015	61	10,000
55016	61	10,000
55017	61	10,000
55018	61	10,000
55019	61	10,000
55020	61	10,000
55021	61	10,000
55022	61	10,000
55023	61	10,000
55024	65	10,000
55025	65	10,000
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55071	77	250
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55727	83	70
55728	83	70
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55740	89	24
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55778	92	20
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55866	90	45
55867	90	45
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55869	90	45
55894	76	400
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55909	91	40
55924	76	400
55925	76	400
55926	76	400
55927	76	400
55928	76	400
55929	76	400
55930	76	400
55932	76	400
55933	76	400

Core Locator & Unit Pack Quantity

High Flux Toroids

P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY
58018	61	10,000	58121	71	2,000	58293	67	8,000	58588	78	300
58019	61	10,000	58122	71	2,000	58308	74	1,000	58614	87	45
58020	61	10,000	58123	71	2,000	58309	74	1,000	58615	87	45
58021	61	10,000	58128	69	6,000	58310	74	1,000	58616	87	45
58022	61	10,000	58129	69	6,000	58312	74	1,000	58617	87	45
58023	61	10,000	58130	69	6,000	58313	74	1,000	58620	87	45
58028	65	10,000	58131	69	6,000	58322	79	220	58714	84	90
58029	65	10,000	58132	69	6,000	58323	79	220	58715	84	90
58030	65	10,000	58133	69	6,000	58324	79	220	58716	84	90
58031	65	10,000	58164	95	6	58326	79	220	58717	84	90
58032	65	10,000	58165	95	6	58327	79	220	58718	84	90
58033	65	10,000	58190	86	80	58336	94	16	58725	83	70
58038	68	8,000	58191	86	80	58337	94	16	58726	83	70
58039	68	8,000	58192	86	80	58338	94	16	58727	83	70
58040	68	8,000	58195	86	80	58339	94	16	58728	83	70
58041	68	8,000	58204	73	1,600	58348	75	720	58734	89	24
58042	68	8,000	58205	73	1,600	58349	75	720	58735	89	24
58043	68	8,000	58206	73	1,600	58350	75	720	58736	89	24
58048	70	5,000	58208	73	1,600	58351	75	720	58737	89	24
58049	70	5,000	58209	73	1,600	58352	75	720	58774	92	20
58050	70	5,000	58238	62	10,000	58353	75	720	58775	92	20
58051	70	5,000	58239	62	10,000	58378	72	2,000	58776	92	20
58052	70	5,000	58240	62	10,000	58379	72	2,000	58777	92	20
58053	70	5,000	58241	62	10,000	58380	72	2,000	58778	92	20
58059	74	1,000	58242	62	10,000	58381	72	2,000	58848	73	1,600
58070	88	35	58243	62	10,000	58382	72	2,000	58866	90	45
58071	77	250	58252	80	180	58383	72	2,000	58867	90	45
58072	88	35	58253	80	180	58408	64	10,000	58868	90	45
58073	88	35	58254	80	180	58409	64	10,000	58869	90	45
58074	88	35	58256	80	180	58410	64	10,000	58894	76	400
58075	88	35	58257	80	180	58411	64	10,000	58906	91	40
58076	79	220	58268	63	10,000	58412	64	10,000	58907	91	40
58083	80	180	58269	63	10,000	58413	64	10,000	58908	91	40
58089	81	120	58270	63	10,000	58437	82	105	58909	91	40
58090	81	120	58271	63	10,000	58438	82	105	58928	76	400
58091	81	120	58272	63	10,000	58439	82	105	58929	76	400
58092	81	120	58273	63	10,000	58440	82	105	58930	76	400
58099	93	25	58278	66	8,000	58441	82	105	58932	76	400
58100	93	25	58279	66	8,000	58546	77	250	58933	76	400
58101	93	25	58280	66	8,000	58547	77	250			
58102	93	25	58281	66	8,000	58548	77	250			
58109	85	90	58282	66	8,000	58550	77	250			
58110	85	90	58283	66	8,000	58551	77	250			
58111	85	90	58288	67	8,000	58583	78	300			
58112	85	90	58289	67	8,000	58584	78	300			
58118	71	2,000	58290	67	8,000	58585	78	300			
58119	71	2,000	58291	67	8,000	58586	78	300			
58120	71	2,000	58292	67	8,000	58587	78	300			

Core Locator & Unit Pack Quantity

Kool Mμ® Toroids

P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY
77020	61	10,000	77180	60	5,000	77337	94	16	77721	84	90
77021	61	10,000	77181	60	5,000	77338	94	16	77725	83	70
77030	65	10,000	77184	60	5,000	77339	94	16	77726	83	70
77031	65	10,000	77185	60	5,000	77350	75	720	77727	83	70
77040	68	8,000	77189	86	80	77351	75	720	77729	83	70
77041	68	8,000	77191	86	80	77352	75	720	77730	83	70
77050	70	5,000	77192	86	80	77354	75	720	77733	83	70
77051	70	5,000	77193	86	80	77355	75	720	77734	89	24
77052	70	5,000	77194	86	80	77356	75	720	77735	89	24
77054	70	5,000	77195	86	80	77380	72	2,000	77736	89	24
77055	70	5,000	77206	73	1,600	77381	72	2,000	77737	89	24
77059	74	1,000	77210	73	1,600	77384	72	2,000	77738	89	24
77068	88	35	77211	73	1,600	77385	72	2,000	77739	89	24
77069	88	35	77212	85	90	77410	64	10,000	77740	89	24
77070	88	35	77213	85	90	77411	64	10,000	77774	92	20
77071	77	250	77214	85	90	77414	64	10,000	77775	92	20
77072	88	35	77224	71	2,000	77415	64	10,000	77776	92	20
77073	88	35	77225	71	2,000	77431	82	105	77777	92	20
77074	88	35	77240	62	10,000	77438	82	105	77778	92	20
77075	88	35	77241	62	10,000	77439	82	105	77824	61	10,000
77076	79	220	77244	62	10,000	77440	82	105	77825	61	10,000
77083	80	180	77245	62	10,000	77442	82	105	77834	65	10,000
77089	81	120	77254	80	180	77443	82	105	77835	65	10,000
77090	81	120	77256	80	180	77444	58	7,500	77844	68	8,000
77091	81	120	77258	80	180	77445	58	7,500	77845	68	8,000
77093	81	120	77259	80	180	77548	77	250	77847	73	1,600
77094	81	120	77260	80	180	77550	77	250	77848	73	1,600
77095	81	120	77270	63	10,000	77552	77	250	77866	90	45
77098	93	25	77271	63	10,000	77553	77	250	77867	90	45
77099	93	25	77280	66	8,000	77555	77	250	77868	90	45
77100	93	25	77281	66	8,000	77585	78	300	77869	90	45
77101	93	25	77290	67	8,000	77586	78	300	77872	90	45
77102	93	25	77291	67	8,000	77587	78	300	77874	63	10,000
77109	85	90	77294	67	8,000	77589	78	300	77875	63	10,000
77110	85	90	77295	67	8,000	77590	78	300	77884	66	8,000
77111	85	90	77310	74	1,000	77591	78	300	77885	66	8,000
77120	71	2,000	77312	74	1,000	77614	87	45	77894	76	400
77121	71	2,000	77314	74	1,000	77615	87	45	77906	91	40
77130	69	6,000	77315	74	1,000	77616	87	45	77907	91	40
77131	69	6,000	77316	74	1,000	77617	87	45	77908	91	40
77140	58	7,500	77324	79	220	77618	87	45	77909	91	40
77141	58	7,500	77326	79	220	77619	87	45	77912	91	40
77150	59	7,500	77328	79	220	77620	87	45	77930	76	400
77151	59	7,500	77329	79	220	77715	84	90	77932	76	400
77154	59	7,500	77330	79	220	77716	84	90	77934	76	400
77155	59	7,500	77334	69	6,000	77717	84	90	77935	76	400
77164	95	6	77335	69	6,000	77719	84	90	77936	76	400
77165	95	6	77336	94	16	77720	84	90			

Core Locator & Unit Pack Quantity

Kool Mµ® Blocks, E Cores, and U Cores

P/N	PAGE	BOX QTY
K114LE026	96	18
K114LE040	96	18
K114LE060	96	18
K130LE026	96	12
K130LE040	96	12
K130LE060	96	12
K160LE026	96	16
K160LE040	96	16
K160LE060	96	16
K1808E026	96	2,880
K1808E040	96	2,880
K1808E060	96	2,880
K1808E090	96	2,880
K2510E026	96	1,728
K2510E040	96	1,728
K2510E060	96	1,728
K2510E090	96	1,728
K3007E026	96	720
K3007E040	96	720
K3007E060	96	720
K3007E090	96	720
K3112U040	98	672
K3112U060	98	672
K3112U090	98	672
K3515E026	96	720
K3515E040	96	720
K3515E060	96	720
K3515E090	96	720
K4017E026	96	264
K4017E040	96	264
K4017E060	96	264
K4017E090	96	264
K4020E026	96	192
K4020E040	96	192
K4020E060	96	192
K4020E090	96	192
K4022E026	96	168
K4022E040	96	168
K4022E060	96	168
K4022E090	96	168
K4110U040	98	480
K4110U060	98	480
K4110U090	98	480
K4111U040	98	480
K4111U060	98	480
K4111U090	98	480
K4119U040	98	240
K4119U060	98	240
K4119U090	98	240
K4317E026	96	270
K4317E040	96	270
K4317E060	96	270
K4317E090	96	270
K4741B026	97	48
K4741B040	97	48
K4741B060	97	48
K5030B026	97	64
K5030B040	97	64
K5030B060	97	64
K5527U026	98	128
K5528B026	97	112
K5528B040	97	112
K5528B060	97	112
K5528E026	96	112
K5528E040	96	112
K5528E060	96	112
K5529U026	98	96
K5530E026	96	96
K5530E040	96	96
K5530E060	96	96
K6030B026	97	80
K6030B040	97	80
K6030B060	97	80
K6527E026	96	54
K6527E040	96	54
K6527E060	96	54
K6527U026	98	54
K6533U026	98	54
K7020B026	97	90
K7020B040	97	90
K7020B060	97	90
K7030B026	97	60
K7030B040	97	60
K7030B060	97	60
K7228E026	96	84
K7228E040	96	84
K7228E060	96	84
K7236U026	98	60
K8020E026	96	63
K8020E040	96	63
K8020E060	96	63
K8020U026	98	63
K8024E026	96	45
K8024E040	96	45
K8024E060	96	45
K8030B026	97	48
K8030B040	97	48
K8030B060	97	48
K8038U026	98	63
K8044E026	96	63
K8044E040	96	63
K8044E060	96	63
K9541B026	97	30

Core Locator & Unit Pack Quantity

XFlux® Toroids

P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY
78051	70	5,000	78192	86	80	78381	72	2,000	78729	83	70
78052	70	5,000	78193	86	80	78382	72	2,000	78730	83	70
78054	70	5,000	78194	86	80	78384	72	2,000	78733	83	70
78055	70	5,000	78208	73	1,600	78385	72	2,000	78735	89	24
78056	70	5,000	78210	73	1,600	78386	72	2,000	78736	89	24
78059	74	1,000	78211	73	1,600	78431	82	105	78737	89	24
78068	88	35	78212	85	90	78439	82	105	78738	89	24
78069	88	35	78213	85	90	78440	82	105	78739	89	24
78071	77	250	78214	85	90	78442	82	105	78775	92	20
78072	88	35	78224	71	2,000	78443	82	105	78776	92	20
78073	88	35	78225	71	2,000	78550	77	250	78777	92	20
78074	88	35	78256	80	180	78552	77	250	78847	73	1,600
78076	79	220	78258	80	180	78553	77	250	78848	73	1,600
78083	80	180	78259	80	180	78555	77	250	78867	90	45
78090	81	120	78260	80	180	78586	78	300	78868	90	45
78091	81	120	78312	74	1,000	78587	78	300	78870	90	45
78093	81	120	78314	74	1,000	78589	78	300	78871	90	45
78094	81	120	78315	74	1,000	78590	78	300	78872	90	45
78095	81	120	78316	74	1,000	78591	78	300	78894	76	400
78096	93	25	78326	79	220	78615	87	45	78907	91	40
78099	93	25	78328	79	220	78616	87	45	78908	91	40
78100	93	25	78329	79	220	78617	87	45	78910	91	40
78102	93	25	78330	79	220	78618	87	45	78911	91	40
78110	85	90	78337	94	16	78619	87	45	78912	91	40
78111	85	90	78338	94	16	78716	84	90	78932	76	400
78113	71	2,000	78342	94	16	78717	84	90	78934	76	400
78121	71	2,000	78351	75	720	78719	84	90	78935	76	400
78122	71	2,000	78352	75	720	78720	84	90	78936	76	400
78159	93	25	78354	75	720	78721	84	90			
78189	86	80	78355	75	720	78726	83	70			
78191	86	80	78356	75	720	78727	83	70			

XFlux® Blocks and E Cores

P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY	P/N	PAGE	BOX QTY
X114LE026	96	18	X4741B026	97	48	X7020B026	97	90
X114LE040	96	18	X4741B040	97	48	X7020B040	97	90
X114LE060	96	18	X4741B060	97	48	X7020B060	97	90
X1808E026	96	2,880	X5030B026	97	64	X7030B026	97	60
X1808E040	96	2,880	X5030B040	97	64	X7030B040	97	60
X1808E060	96	2,880	X5030B060	97	64	X7030B060	97	60
X3515E026	96	720	X5528B026	97	112	X7228E026	96	84
X3515E040	96	720	X5528B040	97	112	X7228E040	96	84
X3515E060	96	720	X5528B060	97	112	X7228E060	96	84
X4017E026	96	264	X5528E026	96	112	X8020E026	96	63
X4017E040	96	264	X5528E040	96	112	X8020E040	96	63
X4017E060	96	264	X5528E060	96	112	X8020E060	96	63
X4020E026	96	192	X5530E026	96	96	X8024E026	96	45
X4020E040	96	192	X5530E040	96	96	X8024E040	96	45
X4020E060	96	192	X5530E060	96	96	X8024E060	96	45
X4022E026	96	168	X6030B026	97	80	X8030B026	97	48
X4022E040	96	168	X6030B040	97	80	X8030B040	97	48
X4022E060	96	168	X6030B060	97	80	X8030B060	97	48
X4317E026	96	270	X6527E026	96	54	X8044E026	96	63
X4317E040	96	270	X6527E040	96	54	X8044E040	96	63
X4317E060	96	270	X6527E060	96	54	X8044E060	96	63

MAGNETICS®

Core Locator & Unit Pack Quantity

Kool Mμ® MAX Toroids

Introduction

Magnetics Molypermalloy Powder (MPP) cores are distributed air gap toroidal cores made from a 81% nickel, 17% iron, and 2% molybdenum alloy powder for the lowest core losses of any powder core material. MPP cores (and all powder cores) exhibit soft saturation, which is a significant design advantage compared with gapped ferrites. Also, unlike ferrites, the MPP saturation curve does not need to be derated with increasing device temperature.

MPP cores possess many outstanding magnetic characteristics, such as high resistivity, low hysteresis and eddy current losses, excellent inductance stability after high DC magnetization or under high DC bias conditions and minimal inductance shift under high AC excitation.

MPP THINZ®, or washer cores, put the premium performance of Magnetics' superior MPP material into robust, low height toroid form, for low profile inductors. With MPP THINZ, exact permeability and height are easily adjusted to result in the optimum design for each application.

Magnetics High Flux powder cores are distributed air gap toroidal cores made from a 50% nickel - 50% iron alloy powder for the highest biasing capability of any powder core material. High Flux cores have advantages that result in superior performance in certain applications involving high power, high DC bias, or high AC excitation amplitude. The High Flux alloy has saturation flux density that is twice that of MPP alloy, and three times or more than that of ferrite. As a consequence, High Flux cores can support significantly more DC bias current or AC flux density.

High Flux offers much lower core losses and superior DC bias compared with powdered iron cores. High Flux cores offer lower core losses and similar DC bias compared with XFLUX cores. Frequently, High Flux allows the designer to reduce the size of an inductive component compared with MPP, powdered iron, or ferrite.

Magnetics Kool Mµ® powder cores are distributed air gap cores made from a ferrous alloy powder for low losses at elevated frequencies. The near zero magnetostriction alloy makes Kool Mµ ideal for eliminating audible frequency noise in filter inductors. In high frequency applications, core losses of powdered iron, for instance, can be a major factor in contributing to undesirable temperature rises. Kool Mµ cores are superior because their losses are significantly less, resulting in lower temperature rises. Kool Mµ cores generally offer a reduction in core size, or an improvement in efficiency, compared with powdered iron cores.

Kool Mµ is available in a variety of core types, for maximum flexibility. Toroids offer compact size and self-shielding. E cores and U cores afford lower cost of winding, use of foil inductors, and ease of fixturing. Very large cores and structures are available to support very high current applications. These include toroids up to 102 mm, 133 mm and 165 mm; large E cores; U cores; stacked shapes; and blocks.

Magnetics Kool Mµ® MAX powder cores are distributed air gap cores made from a ferrous alloy powder offering 50% better DC bias performance than standard Kool Mµ material. Use of copper wire is minimized by maintaining inductance using less turns, resulting in savings in overall component cost. With its super low losses, Kool Mµ MAX does not mimic the same temperature rise problems found in iron powder cores. Inductors built with Kool Mµ MAX do not have several of the disadvantages that are inherent with gapped ferrite cores, including low saturation flux density and fringing losses at the discrete air gap.

Magnetics XFLUX® distributed air gap cores are made from 6.5% silicon iron powder. XFLUX offers lower losses than powdered iron cores and superior DC bias performance. The soft saturation of XFLUX material offers an advantage over ferrite cores. XFLUX cores are ideal for low and medium frequency chokes where inductance at peak load is critical.

Magnetics Kool Mµ®, XFLUX®, MPP, High Flux and Kool Mµ® MAX are true high temperature materials with no thermal aging.

Magnetics is committed to meeting global environmental standards and initiatives. Magnetics' REACH and RoHS compliance statements and reports are available on our website: www.mag-inc.com

Applications and Materials

Magnetics powder cores are most commonly used in power inductor applications, specifically in switch-mode power supply (SMPS) filter inductors, also known as DC inductors or chokes. Other power applications include differential inductors, boost inductors, buck inductors and flyback transformers.

While all five materials are used in these applications, each has its own advantages. For the lowest loss inductor, MPP material should be used since it has the lowest core loss. For the smallest package size in a DC bias dominated design, High Flux material should be used since it has the highest flux capacity. XFLUX® can be a lower cost alternative to High Flux, in situations where the higher core losses and more limited permeability availability of XFLUX is acceptable.

The unique advantages of Magnetics' powder cores are used in a variety of other applications, including: High Q filters, high reliability inductors and filters, high temperature inductors and filters, high current CTs, telecom filters, and load coils.

Magnetics' powder cores are available in a variety of shapes including toroids, E cores, U cores, blocks, and cylinders, which can be used to create customizable structures. *For more information on cylinders or custom shapes, please contact Magnetics.*

		Kool Mμ®	XFLUX®	Kool Mμ® MAX	High Flux	MPP
Alloy Composition		FeSiAl	FeSi	FeSiAl	FeNi	FeNiMo
Available Permeabilities		14-125	26-90	26-60	14-160	14-550
Core Loss - 60μ (mW/cc)	50 kHz, 1000 G	214	590	205	333	174*
	100 kHz, 1000 G	550	1,350	550	900	450*
Perm vs. DC Bias - 60μ (AT/cm)	80% of μ_i	34	76*	52	69	48
	50% of μ_i	76	131*	103	131	84
60μ Temperature Stability - Typical % shift from -60 to 200°C		7%	5%	-	4%	2.5%
Curie Temperature		500°C	700°C	500°C	500°C	460°C
Saturation Flux Density (Tesla)		1.0	1.6	1.0	1.5	0.8
Frequency Response - 60μ flat to…		900 kHz	500 kHz	900 kHz	1 MHz	2MHz
Relative Cost		1*	1.2x	2x	4x-6x	7x-9x

*indicates best choice

A lower cost family of alternative products to Magnetics' five premium powder core materials are powdered irons. Manufacturers of powdered iron use a different production process. For comparison with the above table, powdered irons have permeabilities from 10-100; highest core loss; good perm vs. DC bias; fair temperature stability; lower temperature ratings; soft saturation; 0% nickel content; lowest relative cost.

Kool Mμ and powdered iron cores have comparable DC bias performance. The advantages of Kool Mμ compared with powdered iron include (1) lower core losses; (2) no thermal aging, since Kool Mμ is manufactured without the use of organic binders; (3) near zero magnetostriction, which means that Kool Mμ can be useful for addressing audible noise problems; and (4) better stability of permeability vs. AC flux density.

Material Properties

	PERMEABILITY vs. T, B, & f - TYPICAL			
	Permeability (μ)	μ vs. T dynamic range (-50° C TO +100° C) MATERIALS RATED TO 200° C	μ vs. B dynamic range 0 to 400 mT	μ vs. f. flat to...
MPP	14μ	0.7%	+0.4%	4 MHz
	26μ	0.9%	+0.4%	3 MHz
	60μ	1.0%	+0.8%	2 MHz
	125μ	1.3%	+1.4%	300 kHz
	147μ, 160μ, 173μ	1.5%	+1.9%	200 kHz
	200μ	1.6%	+2.8%	100 kHz
	300μ	1.6%	+4.5%	90 kHz
	550μ	8.7%	+21.0%	20 kHz
High Flux	14μ	1.5%	+5.0%	3 MHz
	26μ	2.0%	+9.0%	1.5 MHz
	60μ	2.6%	+13.5%	1 MHz
	125μ	3.6%	+19.0%	700 kHz
	147μ	4.8%	+22.0%	500 kHz
	160μ	5.5%	+25.0%	400 kHz
Kool Mμ®	26μ	1.7%	+1.0%	2 MHz
	40μ	2.2%	+1.1%	1 MHz
	60μ	3.4%	+1.4%	900 kHz
	75μ	4.5%	+2.0%	500 kHz
	90μ	5.2%	+2.8%	500 kHz
	125μ	8.3%	+3.4%	300 kHz
XFLUX®	26μ	2.5%	-	1 MHz
	60μ	3.0%	+14.5%	500 kHz

	Curie Temperature	Density	Coefficient of Thermal Expansion
MPP	460°C	8.0 grams/cm^3	12.9 x 10^{-6}/°C
High Flux	500°C	7.6 grams/cm^3	5.8 x 10^{-6}/°C
Kool Mμ	500°C	5.5 grams/cm^3	10.8 x 10^{-6}/°C
XFLUX	700°C	7.5 grams/cm^3	11.6 x 10^{-6}/°C

Core Weights

Core weights listed in this catalog are for 125µ cores.*
To determine weights for other permeabilities, multiply the 125µ weight by the following factors:

Permeability	14µ	26µ	40µ	60µ	75µ	90µ	125µ	147µ 160µ 173µ	200µ 300µ	550µ
x Factor	0.80	0.86	0.90	0.94	0.96	0.97	1.00	1.02	1.03	1.04

*XFLUX® and Kool Mµ® MAX are based on 60µ weight.
*MPP, High Flux, and Kool Mµ® in sizes 102, 337, and 165 weight based on 26µ.

Unit Conversions

To obtain number of	Multiply number of	By
A·T/cm	oersteds	0.795
oersteds	A·T/cm	1.26
tesla	gauss	0.0001
gauss	tesla	10,000
gauss	mT(milli Tesla)	10
cm^2	in^2	6.452
cm^2	circular mils	$(5.07)(10^{-6})$

Core Identification

All Magnetics powder cores have unique part numbers that provide important information about the characteristics of the cores. A description of each type of part number is provided below.

TOROIDS

C 0 5 5 2 0 6 A 2

Core Finish Code	Voltage Breakdown (wire to wire)	Material Availability	OD Size Availability
A2	2,000 V_{AC} min	MPP, High Flux	All
A7	2,000 V_{AC} min	Kool Mµ, XFLUX, Kool Mµ MAX	All
AY	600 V_{AC} min	All	3.56 - 16.5 mm
A5	2,000 V_{AC} min	All	6.35 - 23.6 mm
A9	8,000 V_{AC} min	All	>4.65 mm

Catalog Number (designates size and permeability)

Material Code . . . . 55 = MPP
58 = High Flux
77 = Kool Mµ
78 = XFLUX
79 = Kool Mµ MAX

Grading Code . . . . . C0 = Graded into 2% inductance bands – OD <4.65 mm, 5% bands
00 = Not graded

- No voltage breakdown min for A2 or A7 with OD ≤ 4.65mm
- A2 and A7 voltage breakdown is 1000 V_{AC} with 4.65mm < OD < 26.9mm
- AY finish not available for 550µ MPP

Powder Core Toroid Marking Summary						
Size (OD mm)	6-digit Shop Order Number	2-digit Material Code	3-digit Catalog Number	2-digit Core Finish Code	Inductance Code	Marking Example
6.35 - 6.86	✔		✔		✔	123456 020 +6
7.87 - 12.7	✔		✔	✔	✔	123456 050A2 +6
> 12.7	✔	✔	✔	✔	✔	123456 55120A2 +6

- Inductance Code is only marked on MPP and High Flux toroids with C0 grading code
- Cores with OD < 6.35 mm are not marked
- Shop order number identifies the product batch, ensuring traceability of every core through the entire manufacturing process, back to raw materials

SHAPES and THINZ

00K5528E060

Permeability Code ... Permeability, e.g. 060 for 60µ

Shape Code . . . . . . E = E Core
T = Toroid
U = U Core
P = I Core/Plate
B = Block

Size Code . . . . First two digits equal approximate length or OD in mm / Last two digits equal approximate height or ID in mm

Material Code . . . . . K = Kool Mµ
M = MPP*
H = High Flux*
X = XFLUX
*consult factory

Grading Code . . . . . 00 = Not graded
- Full part number and shop order number are marked on all shapes

LARGE E CORES

00K130LE026

Permeability Code . . Permeability, e.g. 026 for 26µ

Shape Code . . . . . . LE = Large E Core

Size Code

Material Code . . . . . M = MPP*
H = High Flux*
K = Kool Mµ
X = XFLUX
*consult factory

Grading Code . . . . . 00 = Not graded
- Full part number and shop order number are marked on all shapes

Inductance and Grading

Measured vs. Calculated Inductance

A_L (Inductance factor) is given for each core in this catalog. Inductance for blocks is tested in standard picture frame arrangements. Units for A_L are nH/T^2. A_L is related to nominal calculated inductance (L_N, in µH) by the number of turns, N.

$$L_N = A_L N^2 10^{-3}$$

Magnetics' inductance standards are measured in a Kelsall Permeameter Cup. Actual wound inductance measured outside a Kelsall Cup is greater than the nominal calculated value due to leakage flux and flux developed by the current in the winding. The difference depends on many variables; core size, permeability, core coating thickness, wire size and number of turns, in addition to the way in which the windings are put on the core. The difference is negligible for permeabilities above 125 and turns greater than 500. However, the lower the permeability and/or number of turns, the more pronounced this deviation becomes.

Example : C055930A2 (26.9 mm, 125µ, p. 76)

Number of Turns	Calculated Inductance	Measured Inductance
1,000	157 mH	+0.0%
500	39.3 mH	+0.5%
300	14.1 mH	+1%
100	1.57 mH	+3%
50	393 µH	+5%
25	98.1 µH	+9%

The following formula can be used to approximate the leakage flux to add to the expected inductance. This formula was developed from historical data of cores tested at Magnetics. Be aware that this will only give an approximation based on evenly spaced windings. You may expect as much as a ±50% deviation from this result.

$$L_{LK} = \frac{0.292\, N^{1.065}\, A_e}{l_e} \quad \text{where:}$$

L_{LK} = leakage inductance adder (µH)
N = number of turns
A_e = core cross section (mm^2)
l_e = core magnetic path length (mm)

Example: C055930A2 with 25 turns (p. 76)

Catalog Data	Calculated Inductance
$A_L = 157\ \text{nH/T}^2$ $A_e = 65.4\ \text{mm}^2$ $l_e = 63.5\ \text{mm}$	$L_N = (157)(25)^2 10^{-3}$ $= 98.1\ \mu\text{H}$
Leakage Adder	**Estimated Measured Inductance**
$L_{LK} = \frac{0.292\,(25)^{1.065}(65.4)}{63.5}$ $= 9.3\ \mu\text{H}$	$L = L_N + L_{LK}$ $= 98.1 + 9.3$ $= 107\ \mu\text{H}$

Core Inductance Tolerance and Grading

Magnetics powder cores are precision manufactured to an inductance tolerance of ± 8%*, using standard Kelsall Permeameter Cup measurements with a precision series inductance bridge.

MPP and High Flux cores with outside diameters > 4.65 mm are graded into 2% inductance bands as a standard practice at no additional charge. Core grading can reduce winding costs by minimizing turns adjustments when building high turns inductors to very tight inductance specifications. MPP cores 4.65 mm and smaller are graded into 5% bands.

PARTS NOT GRADED		
• 14µ and 26µ cores • MPP THINZ® • Parylene coated cores		
The following toroid OD sizes:		
62.0 mm OD	68.0 mm OD	74.1 mm OD
77.8 mm OD	101.6 mm OD	132.6 mm OD
165.1 mm OD		

Graded Magnetics MPP cores and High Flux cores are also available with tolerances tighter than the standard ± 8%.

*THINZ and Kool Mµ cores with OD < 12.7 mm have wider tolerances.

GRADE Stamped on Core OD	INDUCTANCE % Deviation from Nominal		TURNS % Deviation from Nominal	
	From	To	From	To
+8	+8	+7	-4.0	-3.5
+6	+7	+5	-3.5	-2.5
+4	+5	+3	-2.5	-1.5
+2	+3	+1	-1.5	-0.5
+0	+1	-1	-0.5	+0.5
-2	-1	-3	+0.5	+1.5
-4	-3	-5	+1.5	+2.5
-6	-5	-7	+2.5	+3.5
-8	-7	-8	+3.5	+4.0

Core Coating

Magnetics toroidal powder cores are coated with a special epoxy finish that provides a tough, wax tight, moisture and chemical resistant barrier having excellent dielectric properties. Toroids up to 16.5 mm OD can also be parylene coated. Contact Magnetics for parylene-coated toroid requests.

Material	Color	Core Finish Codes
MPP	Gray	A2, A5, A9
High Flux	Khaki	A2, A5, A9
Kool Mμ®	Black	A7, A5, A9
XFLUX®	Brown	A7, A5, A9
Kool Mμ® MAX	Black	A7, A5, A9

The finish is tested for voltage breakdown by inserting a core between two weighted wire mesh pads. Force is adjusted to produce a uniform pressure of 10 psi, simulating winding pressure. The test condition for each core in the random sample set, to guarantee minimum breakdown voltage in each production batch, is 60 Hz rms voltage at 1.25 the guaranteed limit. A2 and A7 samples (26.9 mm and larger) are tested to 2500 V min wire-to-wire. AY samples are tested to 750 V min wire-to-wire.

Higher minimum breakdown coatings can be applied upon request for cores larger than 4.65 mm.

Toroids as large as 16.5 mm outside diameter can be coated with parylene to minimize the constriction of the inside diameter. All finished dimensions in this catalog are for epoxy coating (A2 or A7). For a parylene coated toroid (AY), the maximum OD and HT are reduced by 0.18 mm (0.007”), and the minimum ID is increased by 0.18 mm (0.007”).

The maximum steady-state operating temperature for epoxy coating is 200°C. The maximum steady-state operating temperature for parylene coating is 130°C, but it can be used as high as 200°C for short periods, such as during board soldering. High temperature operation of Magnetics powder cores does not affect magnetic properties.

MPP, High Flux, Kool Mμ, XFLUX, and Kool Mμ MAX materials can be operated continuously at 200°C with no aging or damage.

NOTE: Special powder grades and processing were historically used with MPP for passive filter inductors. For information regarding D4, W4, M4 and L6 codes, or precision inductor processing, contact Magnetics.

Inductor Core Selection Procedure

Only two parameters of the design application must be known to select a core for a current-limited inductor; inductance required with DC bias and the DC current. Use the following procedure to determine the core size and number of turns.

1. Compute the product of LI^2 where:
   L = inductance required with DC bias (mH)
   I = DC current (A)

2. Locate the LI^2 value on the Core Selector Chart (pgs. 24 - 27). Follow this coordinate to the intersection with the first core size that lies above the diagonal permeability line. This is the smallest core size that can be used.

3. The permeability line is sectioned into standard available core permeabilities. Selecting the core listed on the graph will tend to be the best tradeoff between A_L and DC bias.

4. Inductance, core size, and permeability are now known. Calculate the number of turns by using the following procedure:

   (a) The inductance factor (A_L in nH/T²) for the core is obtained from the core data sheet. Determine the minimum A_L by using the worst case negative tolerance (generally -8%). With this information, calculate the number of turns needed to obtain the required inductance from:

   $$N = \sqrt{\frac{L\,10^3}{A_L}}$$

   Where L is required inductance (μH)

   (b) Calculate the bias in A·T/cm from:

   $$H = \frac{NI}{l_e}$$

   (c) From the Permeability vs. DC Bias curves (pgs. 29 - 33), determine the rolloff percentage of initial permeability for the previously calculated bias level. Curve fit equations shown in the catalog can simplify this step. They are also available to use on Magnetics website: http://www.mag-inc.com/design/design-guides/Curve-Fit-Equation-Tool

   (d) Multiply the required inductance by the percentage rolloff to find the inductance with bias current applied.

   (e) Increase the number of turns by dividing the initial number of turns (from step 4(a)) by the percentage rolloff. This will yield an inductance close to the required value after steps 4 (b), (c) and (d) are repeated.

   (f) Iterate steps 4 (b), (c) and (d) if needed to adjust turns up or down until the biased inductance is satisfactorily close to the target.

5. Choose a suitable wire size using the Wire Table (p. 28). Duty cycles below 100% allow smaller wire sizes and lower winding factors, but do not allow smaller core sizes.

6. Design Checks

   (a) **Winding Factor**. See p.17 for notes on checking the coil design.

   (b) **Copper Losses**. See p.17 for notes on calculating conductor resistance and losses.

   (c) **Core Losses**. See p.18 for notes on calculating AC core losses. If AC losses result in too much heating or low efficiency, then the inductor may be loss-limited rather than current-limited. Design alternatives for this case include using a larger core or a lower permeability core to reduce the AC flux density; or using a lower loss material such as MPP or Kool Mμ MAX in place of Kool Mμ, or High Flux in place of XFLUX.

   (d) **Temperature Rise**. Dissipation of the heat generated by conductor and core losses is influenced by many factors. This means there is no simple way to predict temperature rise (△T) precisely. But the following equation is known to give a useful approximation for a component in still air. Surface areas for cores wound to 40% fill are given with the core data in this catalog.

   $$\Delta T\,(^\circ C) = \left(\frac{\text{Total Losses (mW)}}{\text{Component Surface Area (cm}^2\text{)}}\right)^{0.833}$$

Core Selection Example

Determine core size and number of turns to meet the following requirement:

(a) Minimum inductance with DC bias of 0.6 mH (600 µH)
(b) DC current of 5.0 A

1. $LI^2 = (0.6)(5.0)^2 = 15.0$ mH·A²

2. Using the Kool Mµ Toroids LI^2 chart found on p. 25, locate 15 mH·A² on the bottom axis. Following this coordinate vertically results in the selection of 0077083A7 as an appropriate core for the above requirements.

3. From the 0077083A7 core data p. 80, the inductance factor (A_L) of this core is 81 nH/T² ± 8%. The minimum A_L of this core is 74.6 nH/T².

4. The number of turns needed to obtain 600 µH at no load is 90 turns. To calculate the number of turns required at full load, determine the DC bias level: $H = N{\cdot}I/l_e$ where l_e is the path length in cm. The DC bias is 45.7 A·T/cm, yielding 71% of initial permeability from the 60µ Kool Mµ DC bias curve on p. 30.The adjusted turns are 90/0.71 =127 Turns.

5. Re-calculate the DC bias level. The permeability versus DC bias curve shows 57% of initial permeability at 64.5 A·T/cm.

6. Multiply the minimum A_L 74.6 nH/T² by 0.57 to yield effective A_L = 42.5 nH/T². The inductance of this core with 127 turns and with 64.5 A·T/cm will be 685 µH minimum. The inductance requirement has been met.

7. The wire table indicates that 17 AWG is needed to carry 5.0 A with a current density of 500 A/cm². 127 turns of 17 AWG (wire area = 1.177 mm²) equals a total wire area of 149.5 mm². The window area of a 0077083A7 is 427 mm². Calculating window fill, 149.5 mm²/427 mm² corresponds to an approximate 35% winding factor. A 0077083A7 with 127 turns of 17 AWG is a manufacturable design.

Toroid Winding

Winding Factor

Winding factor, also called fill factor, is the ratio of total conductor cross section (usually copper cross section) to the area of the core window. In other words, in a toroid, winding factor is given by:

$N \cdot A_W / W_A$

where:
- N = Number of turns
- A_W = Area of the wire
- W_A = Window Area of the core $\frac{\pi}{4} \cdot ID^2$

Toroid Core Winding factors can vary from 20-60%, a typical value in many applications being 35-40%.

In practice, several approaches to toroid winding are used:

- Single layer: The number of turns is limited by the inside circumference of the core divided by the wire diameter. Advantages are lower winding capacitance, more repeatable parasitics, good cooling, and low cost. Disadvantages are reduced power handling and higher flux leakage.
- Low fill: For manufacturing ease and reduced capacitance, winding factor between single layer and 30% may be used.
- Full winding: Factors between 30% and 45% are normally a reasonable trade off between fully utilizing the space available for a given core size, while avoiding excessive manufacturing cost.
- High fill: Winding factors up to about 65% are achievable, but generally only with special expensive measures, such as completing each coil by hand after the residual hole becomes too small to fit the winding shuttle.

Estimating Wound Coil Dimensions

For each core size, wound coil dimensions are given for 40% winding factor, since this is a typical, practical value. Worst case package dimensions for coils wound completely full are also shown. These are max expected OD and max expected HT.

To estimate dimensions for other winding factors, use:

$$OD_{x\%} = \sqrt{\frac{X\%}{40\%}\left(OD_{40\%}^2 - OD_{core}^2\right) + OD_{core}^2}$$

$$HT_{x\%} = ID_{core} + HT_{core} - \sqrt{\frac{100\% - X\%}{60\%}}\left(ID_{core} + HT_{core} - HT_{40\%}\right)$$

Where: X% is the new winding factor;
$OD_{40\%}$ and $HT_{40\%}$ are the coil dimensions shown on the core data page;
OD_{core} and HT_{core} are the maximum core dimensions after finish.

MLT and DCR

MLT (Mean Length of Turn) is given for a range of winding factors for each core size. To estimate DCR, first, calculate the winding factor for the core, wire gauge, and number of turns selected. On the wire table look up resistance per unit of length for the gauge selected. On the data page for the core selected, consult the Winding Turn Length chart. Unless the winding factor is exactly one of the values listed, interpolate to find the MLT. Then,

$$DCR = (MLT)(N)\ (\Omega/\text{Length}).$$

For single layer winding, MLT is the 0% fill value on each core data page. Even easier, DCRs for single layer windings for a range of wire gauges are given in the winding tables on pgs. 103 - 107.

Wire Loss

DC copper loss is calculated directly as I^2R. Naturally, for aluminum conductors, a suitable wire table must be used. Also, the increase of wire resistance with temperature should be considered.

AC copper loss can be significant for large ripple and for high frequency. Unfortunately, calculation of AC copper loss is not a straight-forward matter. Estimates are typically used.

Powder Core Loss Calculation

Core loss is generated by the changing magnetic flux field within a material, since no magnetic materials exhibit perfectly efficient magnetic response. Core loss density (PL) is a function of half of the AC flux swing (½ $\triangle B = B_{pk}$) and frequency (f). It can be approximated from core loss charts or the curve fit loss equation:

$$PL = aB_{pk}^{\ b} f^{c}$$

where a, b, c are constants determined from curve fitting, and B_{pk} is defined as half of the AC flux swing:

$$B_{pk} = \frac{\triangle B}{2} = \frac{B_{AC\,max} - B_{AC\,min}}{2}$$

Units typically used are (mW/cm³) for PL; Tesla (T) for B_{pk}; and (kHz) for f.
The task of core loss calculation is to determine B_{pk} from known design parameters.

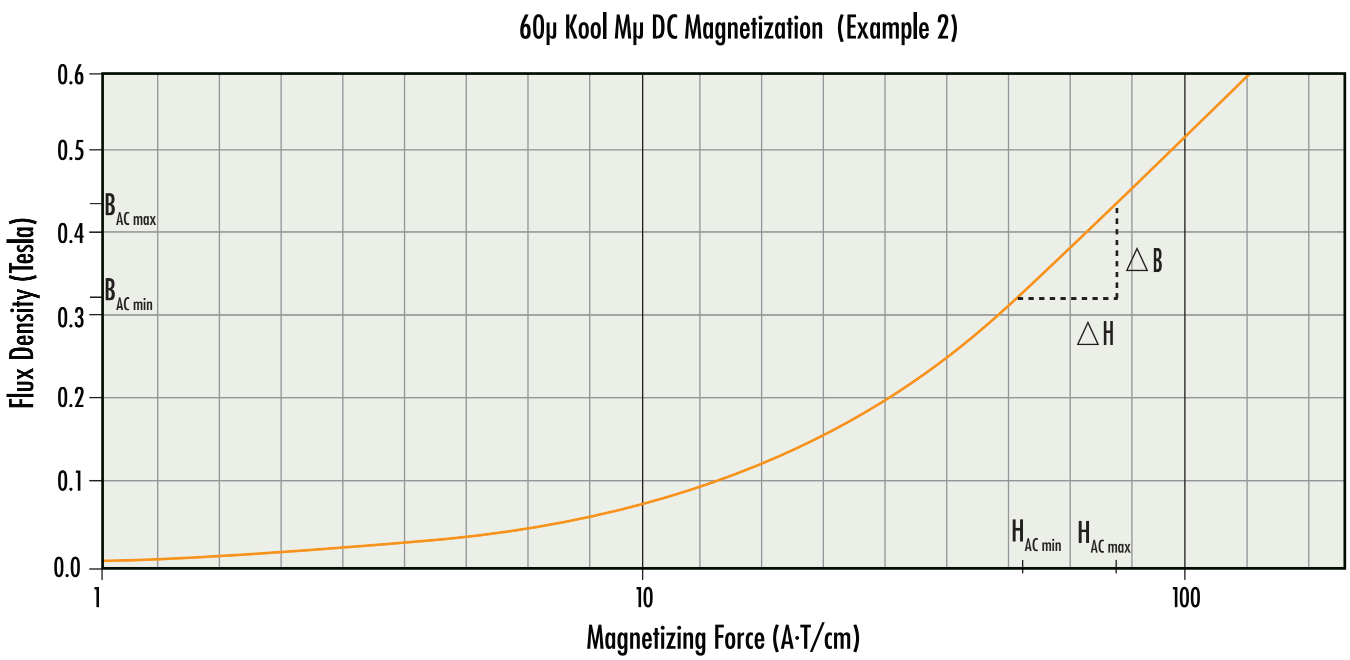
Method 1 – Determine B_{pk} from DC Magnetization Curve. $B_{pk} = f(H)$

Flux density (B) is a non-linear function of magnetizing field (H), which in turn is a function of winding number of turns (N), current (I), and magnetic path length (l_e). The value of B_{pk} can typically be determined by first calculating H at each AC extreme:

$$H_{ACmax} = \left[\frac{N}{l_e}\left(I_{DC} + \frac{\Delta I}{2}\right)\right]$$

$$H_{ACmin} = \left[\frac{N}{l_e}\left(I_{DC} - \frac{\Delta I}{2}\right)\right]$$

Units typically used are (A·T/cm) for H.
From $H_{AC\,max}$, $H_{AC\,min}$, and the BH curve or equation (listed as DC Magnetization, pgs. 47 - 50) $B_{AC\,max}$, $B_{AC\,min}$ and therefore B_{pk} can be determined.



Example 1 - AC current is 10% of DC current:

Approximate the core loss of an inductor with 20 turns wound on Kool Mµ p/n 77894A7 p. 76 (60µ, l_e=6.35 cm, A_e=0.654 cm², A_L=75 nH/T²). Inductor current is 20 Amps DC with ripple of 2 Amps peak-peak at 100kHz.

1.) Calculate H and determine B from BH curve (p. 48) or curve fit equation (p. 50):

$$H_{ACmax} = \frac{20}{6.35}\left(20 + \frac{2}{2}\right) = 66.14\ \text{A·T/cm} \rightarrow B_{ACmax} \cong 0.40T$$

$$H_{ACmin} = \frac{20}{6.35}\left(20 - \frac{2}{2}\right) = 59.84\ \text{A·T/cm} \rightarrow B_{ACmin} \cong 0.37T$$

$$\rightarrow B_{pk} = \frac{\triangle B}{2} = \frac{0.40 - 0.37}{2} = 0.015T$$

2.) Determine Core Loss density from chart or calculate from loss equation p. 46:

$$PL = (62.65)(0.015^{1.781})(100^{1.36}) \cong 18.5\ \frac{mW}{cm^3}$$

3.) Calculate core loss:

$$P_{fe} = (PL)(l_e)(A_e) \sim (18.5)(6.35)(0.654) \cong 77mW$$

Powder Core Loss Calculation

Example 2 - AC current is 40% of DC current:

Approximate the core loss for the same 20-turn inductor, with same inductor current of 20 Amps DC but ripple of 8 Amps peak-peak at 100kHz.

1.) Calculate *H* and determine *B* from BH curve fit equation p. 50:

$$H_{ACmax} = \frac{20}{6.35}\left(20+\frac{8}{2}\right) = 75.59\ {}^{A\cdot T}/_{cm} \rightarrow B_{ACmax} \cong 0.44T$$

$$H_{ACmin} = \frac{20}{6.35}\left(20-\frac{8}{2}\right) = 50.39\ {}^{A\cdot T}/_{cm} \rightarrow B_{ACmin} \cong 0.33T$$

$$\rightarrow B_{pk} = \frac{\triangle B}{2} = \frac{0.44-0.33}{2} = 0.055T$$

2.) Determine Core Loss density from chart or calculate from loss equation p. 46: $PL = (62.65)(0.055^{1.781})(100^{1.36}) \cong 188\ \frac{mW}{cm^3}$

3.) Calculate core loss: $P_{fe} = (PL)(l_e)(A_e) = (188)(6.35)(0.654) \cong 781mW$

Note: Core losses result only from AC excitation. DC bias applied to any core does not cause any core losses, regardless of the magnitude of the bias.

Example 3 – pure AC, no DC:

Approximate the core loss for the same 20-turn inductor, now with 0 Amps DC and 8 Amps peak-peak at 100kHz.

1.) Calculate H and determine B from BH curve fit equation p. 50:

$$H_{ACmax} = \frac{20}{6.35}\left(+\frac{8}{2}\right) = 12.60\ {}^{A\cdot T}/_{cm} \rightarrow B_{ACmax} \cong 0.092T$$

$$H_{ACmin} = \frac{20}{6.35}\left(-\frac{8}{2}\right) = -12.60\ {}^{A\cdot T}/_{cm} \rightarrow B_{ACmin} \cong -0.092T$$

$$\rightarrow B_{pk} = \frac{\triangle B}{2} \sim 0.092T$$

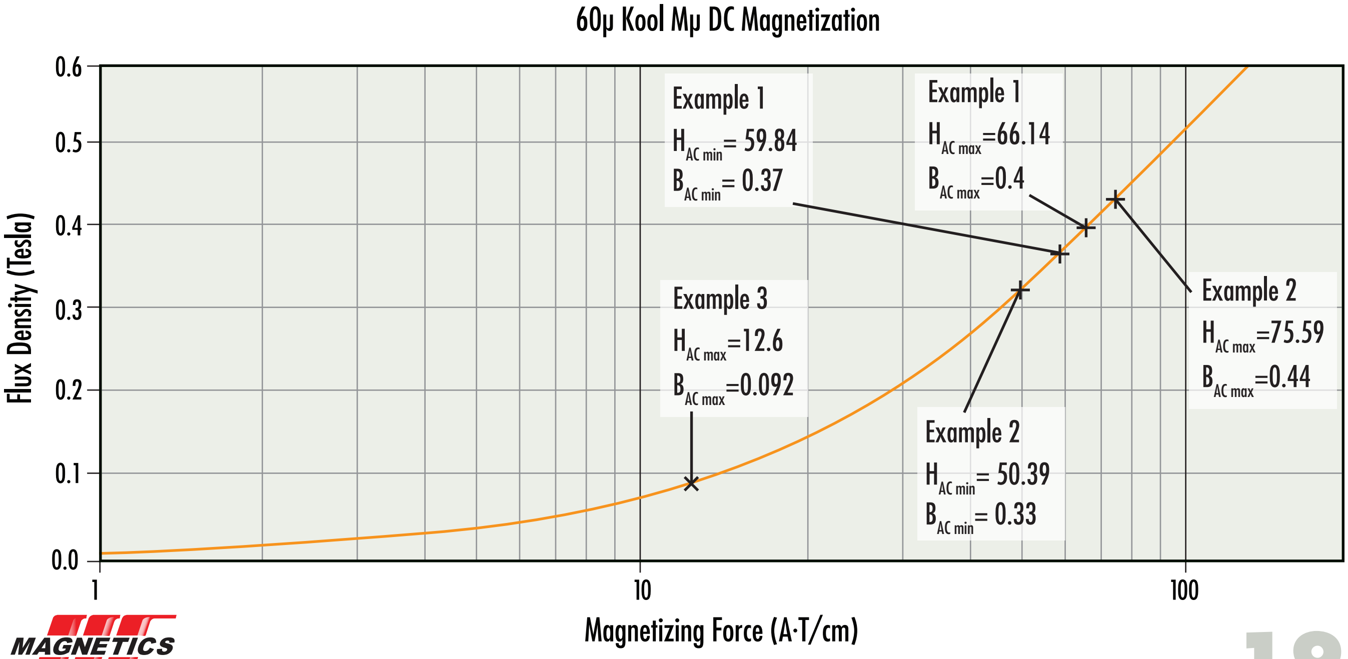
Note: Curve fit equations are not valid for negative values of B. Evaluate for the absolute value of B, then reverse the sign of the resulting H value.

2.) Determine Core Loss density from chart or calculate from loss equation p. 46.

$$PL = (62.65)(0.092^{1.781})(100^{1.36}) \cong 470\ \frac{mW}{cm^3}$$

3.) Calculate core loss: $P_{fe} = (PL)(l_e)(A_e) = (470)(6.35)(0.654) \cong 1.95W$

Plotted below are the operating ranges for each of the three examples.
Note the significant influence of DC bias on core loss, comparing Example 3 with Example 2. Lower permeability results in less B_{pk}, even if the current ripple is the same. This effect can be achieved with DC bias, or by selecting a lower permeability material.



Powder Core Loss Calculation

Method 2, for small △H, approximate B_{pk} from effective perm with DC bias. $B_{pk} = f(\mu_e, \triangle H)$

The instantaneous slope of the BH curve is defined as the absolute permeability, which is the product of permeability of free space ($\mu_0=4\pi \times 10^{-7}$) and the material permeability (μ), which varies along the BH curve. For small AC, this slope can be modeled as a constant throughout AC excitation, with μ approximated as the effective perm at DC bias (μ_e):

$$\frac{dB}{dH} = \mu_0\mu_e \quad \rightarrow \frac{\triangle B}{\triangle H} = \mu_0\mu_e \quad \rightarrow \triangle B = \mu_0\mu_e \triangle H \quad B_{pk} = \frac{\triangle B}{2} = (0.5)\,\mu_0\mu_e \triangle H$$

The effective perm with DC bias is shown in this catalog as % of initial perm and can be obtained from the DC bias curve or curve fit equation, pgs 29 - 34

$$B_{pk} = (0.5)(\mu_0)(\%\mu_i)(\mu_i)(100)(\triangle H) \quad \text{where} \quad \triangle H = \frac{N\triangle I}{l_e}$$

△H is multiplied by 100 because l_e is expressed in cm, while B_{pk} units include m.

Reworking Example 1 (20 Amps DC, 2 Amps pk-pk)

$$H_{DC} = \left[\frac{20}{6.35}(20)\right] = 63\ ^{A\cdot T}/_{cm} \quad \rightarrow \quad \text{from curve or curve fit equation, } \%\mu_i = 0.58$$

$$\mu_i = 60$$

$$\triangle H = \frac{N\triangle I}{l_e} = \frac{20(2)}{6.35} = 6.3\ ^{A\cdot T}/_{cm}$$

$$B_{pk} = 0.5(4\pi \times 10^{-7})(0.58)(60)(100)(6.3) \cong 0.014T \quad \text{(this compares to 0.015T using Method 1)}$$

Reworking Example 2 (20 Amps DC, 8 Amps pk-pk)

From example 1,

$$H_{DC} = 63\ ^{A\cdot T}/_{cm}, \%\mu_i = 0.58;\ \mu_i = 60$$

$$\triangle H = \frac{N\triangle I}{l_e} = \frac{20(8)}{6.35} = 25.2\ ^{A\cdot T}/_{cm}$$

$$B_{pk} = 0.5(4\pi \times 10^{-7})(0.58)(60)(100)(25.2) = 0.055T \quad \text{(this compares to 0.055T using Method 1)}$$

Reworking Example 3 (0 Amps DC, 8 Amps pk-pk)

From example 2,

$$\triangle H = 25.20\ ^{A\cdot T}/_{cm}$$

$$H_{DC} = 0\ ^{A\cdot T}/_{cm} \quad \%\mu_i = 1$$

$$B_{pk} = 0.5(4\pi \times 10^{-7})(1)(60)(100)(25.2) = 0.095T \quad \text{(this compares to 0.092T using Method 1)}$$

Powder Core Loss Calculation

Method 3, for small $\triangle H$, determine B_{pk} from biased inductance. $B_{pk} = f(L,I)$

B can be rewritten in terms of inductance by considering Faraday's equation and its effect on inductor current:

$$V_L = NA\frac{dB}{dt} = L\frac{dI}{dt} \rightarrow dB = \frac{L}{NA}dI$$

L varies non-linearly with I. For small AC, L can be assumed constant throughout AC excitation and is approximated by the biased inductance (L_{DC}).

$$\triangle B = \frac{L_{DC}\triangle I}{NA} \rightarrow B_{pk} = \frac{L_{DC}\triangle I}{2NA_e}$$

Another way of looking at this is by rewriting the relationship between B and L as:

$$\rightarrow \frac{dB}{dH} = \frac{L}{NA}\frac{dI}{dH}$$

Substituting (dH/dI) with (N/l_e) and A with A_e:

$$\rightarrow \frac{dB}{dH} = \frac{L\,l_e}{N^2A_e}$$

L varies non-linearly with H. For small AC, the slope of the BH curve is assumed constant throughout AC excitation, and L is approximated by the biased inductance (L_{DC}).

$$\frac{\triangle B}{\triangle H} = \frac{L_{DC}l_e}{N^2A_e} \rightarrow \triangle B = \frac{L_{DC}\,l_e}{N^2A_e}\triangle H = \frac{L_{DC}\triangle I}{NA_e} \rightarrow \triangle B_{pk} = \frac{L_{DC}\triangle I}{2NA_e}$$

Powder Core Loss Calculation

Reworking Example 1:

$$L_{nl}\text{ (no load)} = (A_L)(N^2) = (75\text{ nH/T}^2)(20^2) = 30\mu H$$

$$L_{DC}(20A) = (\%\mu_i)(L_{nl}) = (0.58)(30) = 17.4\mu H$$

$$\rightarrow B_{pk} = \frac{(17.4)(10^{-6})(2)}{2(20)(0.654)(10^{-4})} = 0.013T$$ (this compares to 0.015T per Method 1, 0.014T per Method 2).

Reworking Example 2:

From example 1, $L_{DC} = 17.4\mu H$

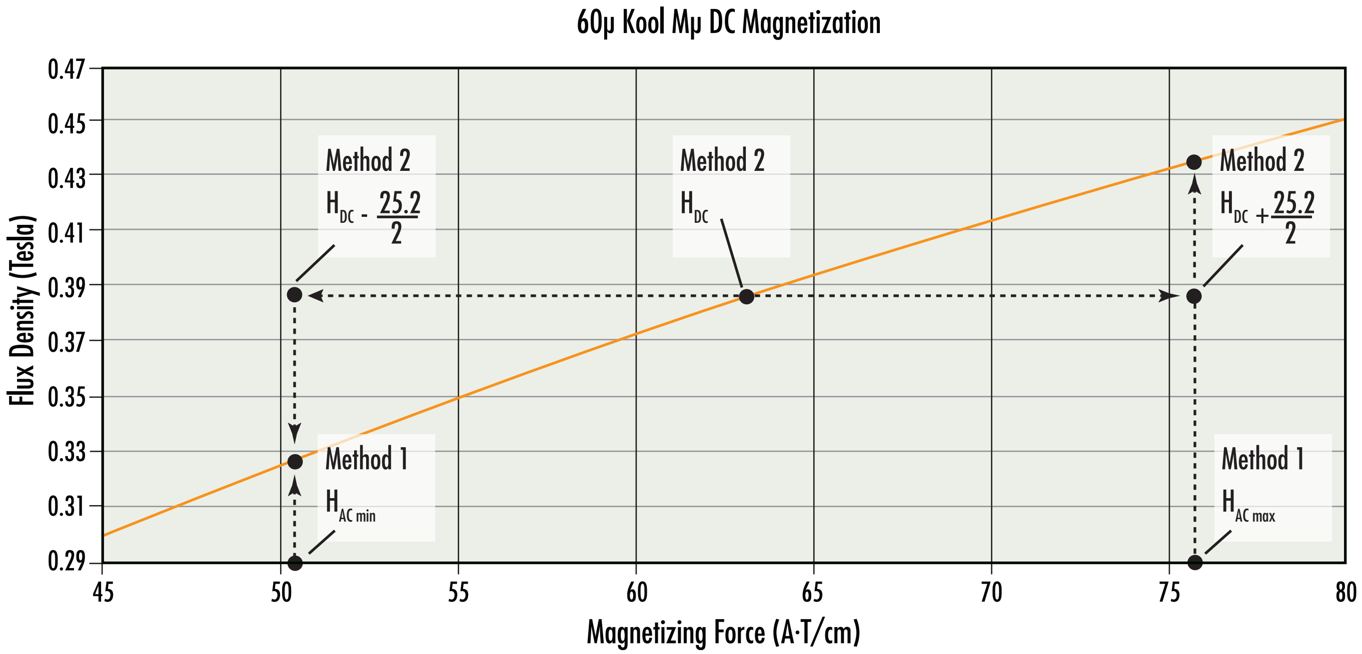
$$\rightarrow B_{pk} = \frac{(17.4)(10^{-6})(8)}{2(20)(0.654)(10^{-4})} = 0.053T$$ (this compares to 0.055T per Method 1, 0.055T per Method 2).

Reworking Example 3:

$$L_{DC} = L_{nl} = 30\mu H$$

$$\rightarrow B_{pk} = \frac{(30)(10^{-6})(8)}{2(20)(0.654)(10^{-4})} = 0.092T$$ (this compares to 0.092T per Method 1, 0.095T per Method 2).

The plot below illustrates the difference between Method 1 and Method 2



Core Selector Charts

The core selector charts are a quick guide to finding the optimum permeability and smallest core size for DC bias applications. These charts are based on a permeability reduction of not more than 50% with DC bias, typical winding factors of 40% for toroids and 60% for shapes, and an AC current that is small relative to the DC current. These charts are based on the nominal core inductance and a current density 500-600 A/cm^2.

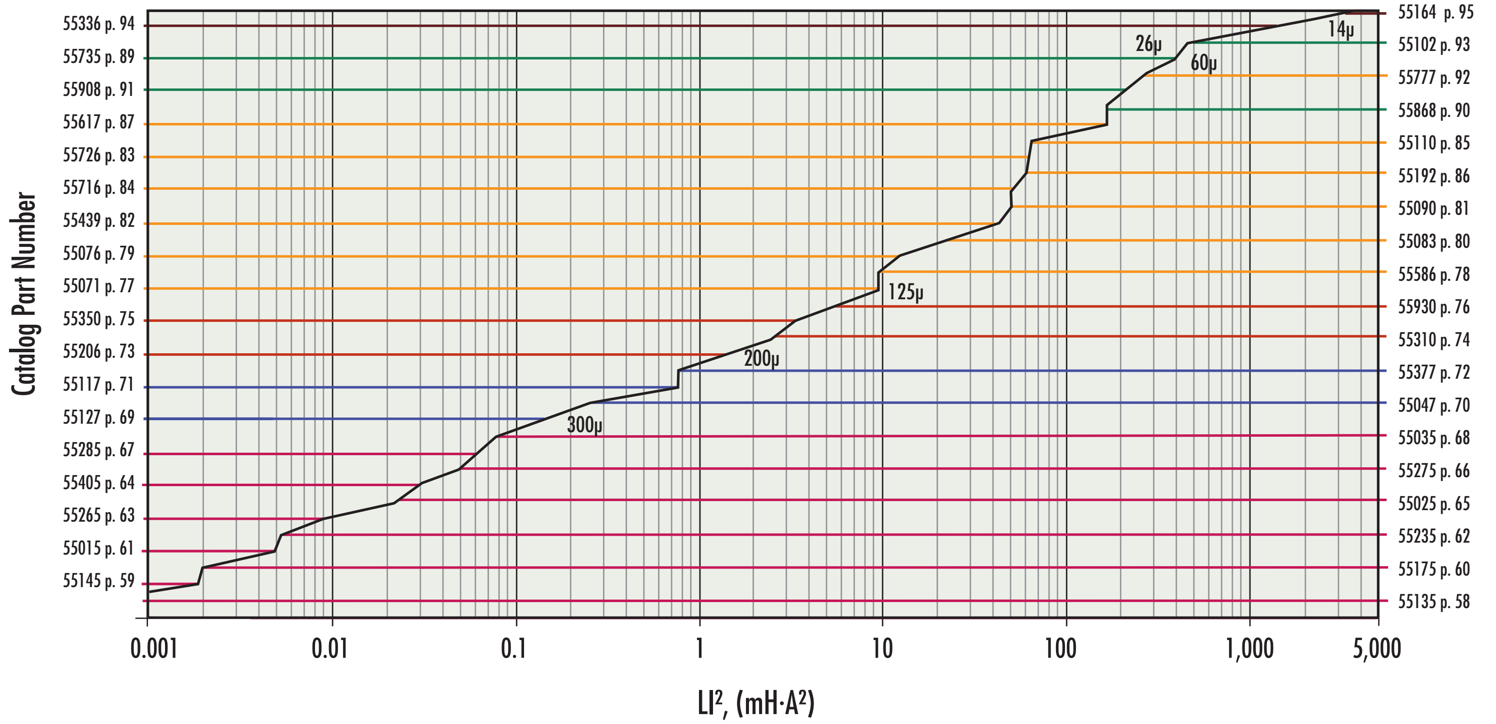
If a core is being selected for use with a large AC current relative to any DC current, such as a flyback inductor or buck/boost inductor, frequently a larger core will be needed to limit the core losses due to AC flux. In other words, the design becomes loss-limited rather than bias-limited.

For additional power handling capability, stacking of cores will yield a proportional increase in power handling. For example, double stacking of the 55908 core will result in doubled power handling capability to about 400 mH·A^2.

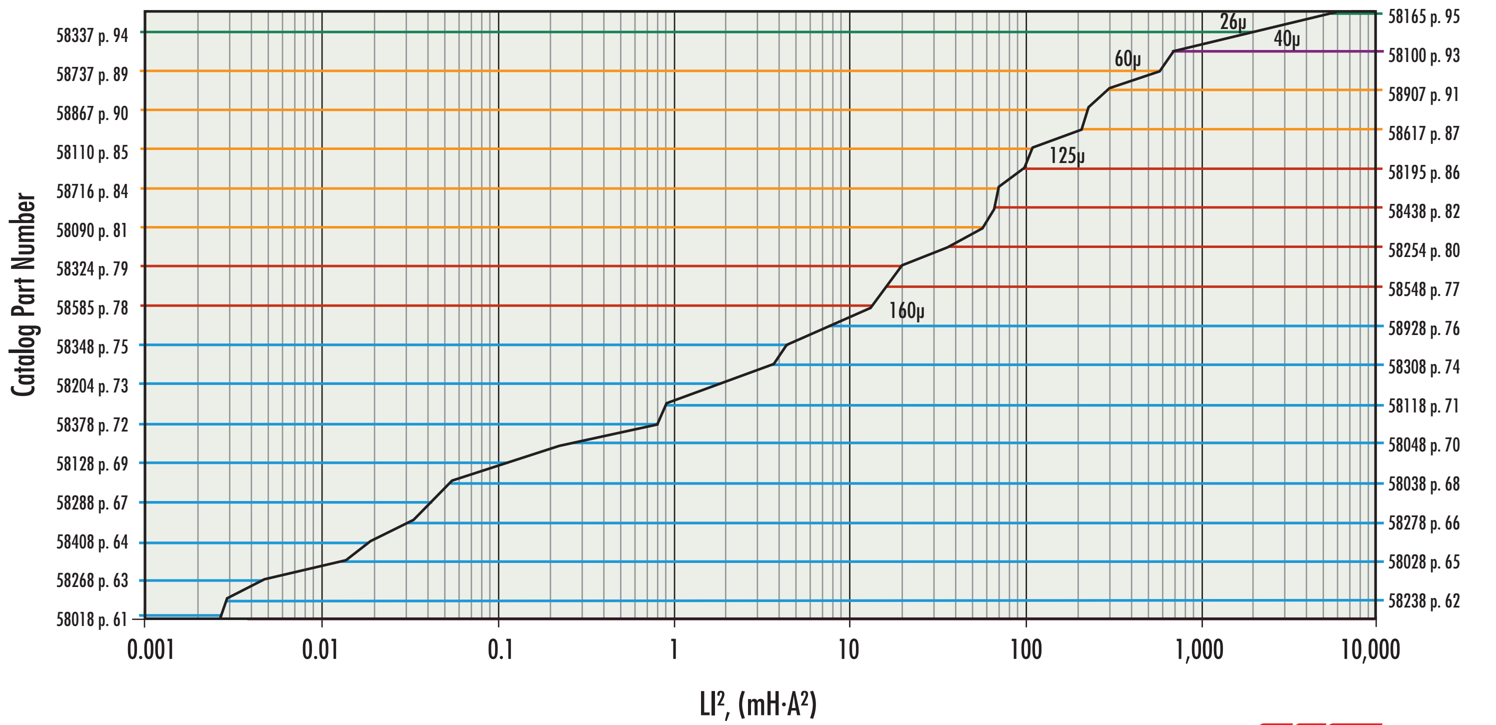
Cores with increased heights are easily ordered. Contact Magnetics for more information.

Core Selector Charts

MPP Toroids

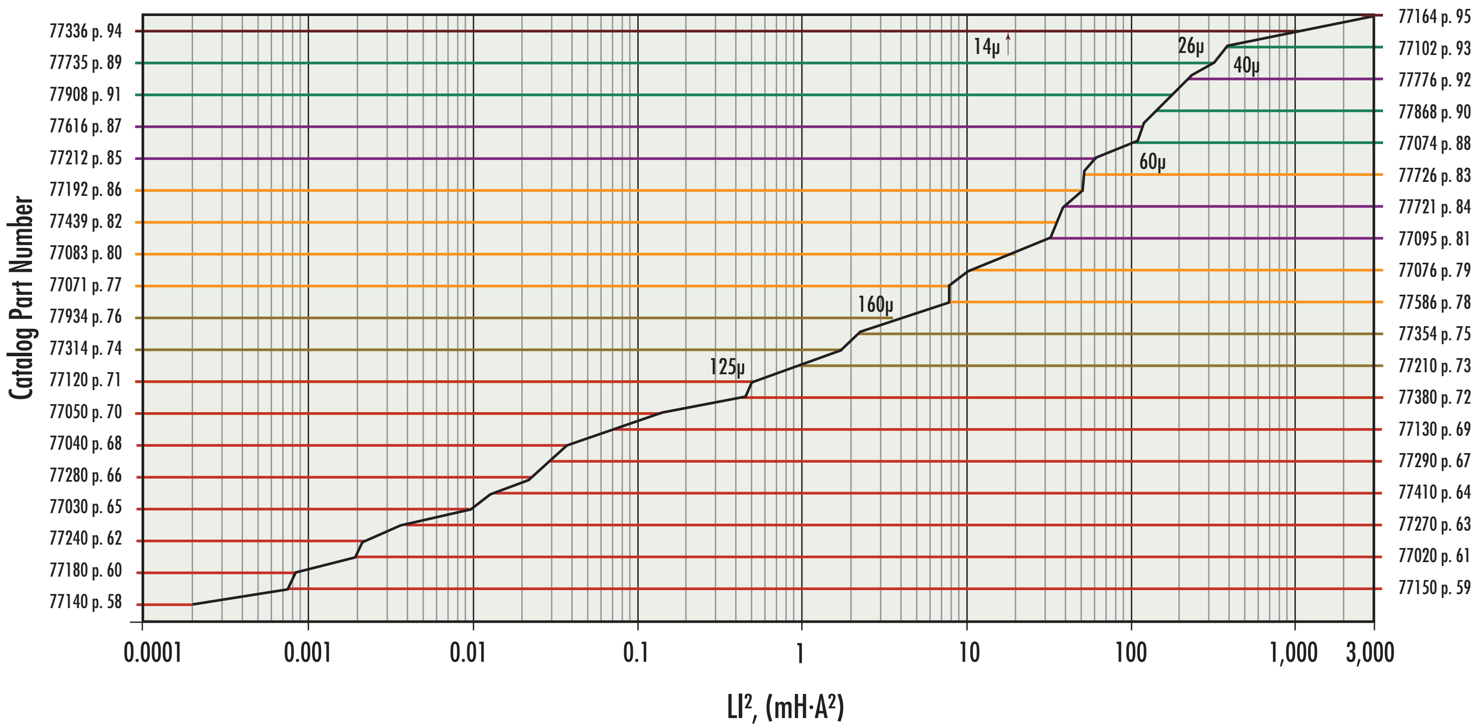


High Flux Toroids

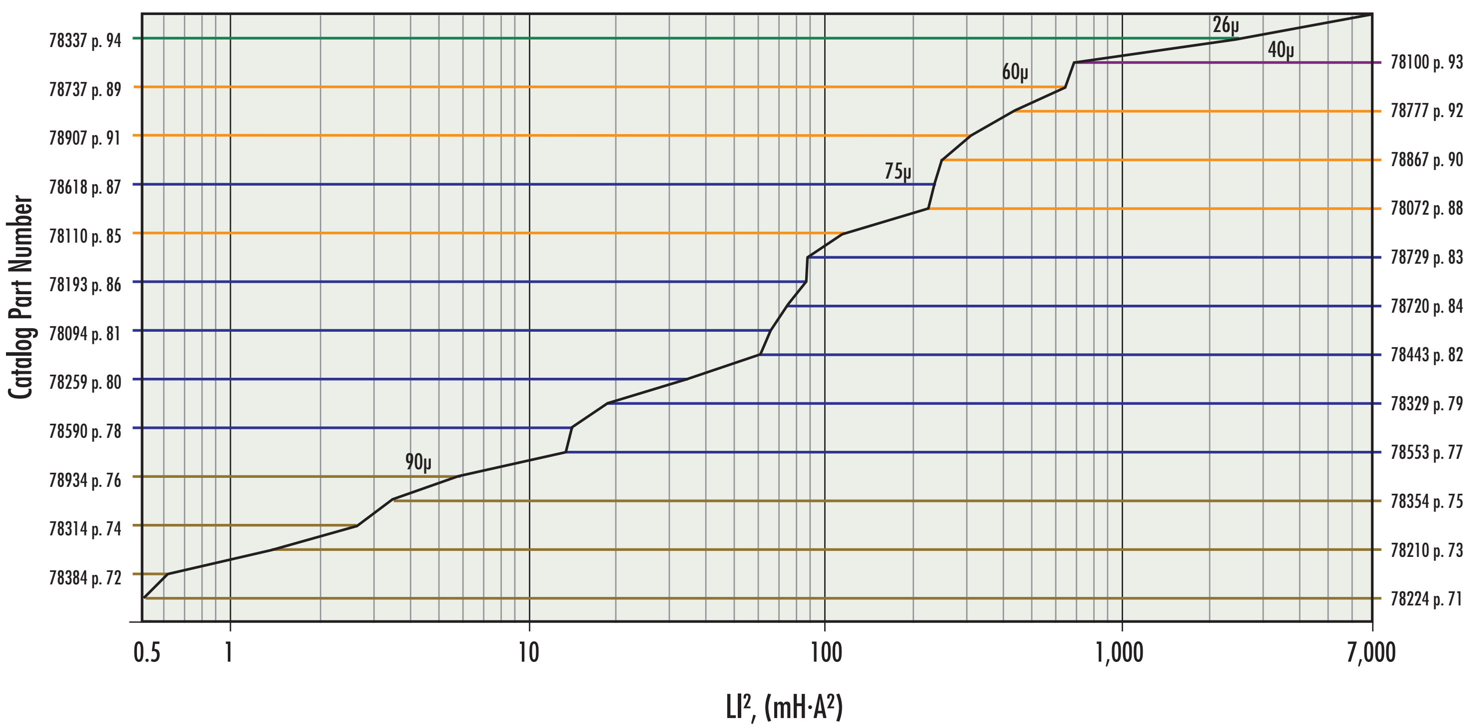


Core Selector Charts

Kool Mμ® Toroids

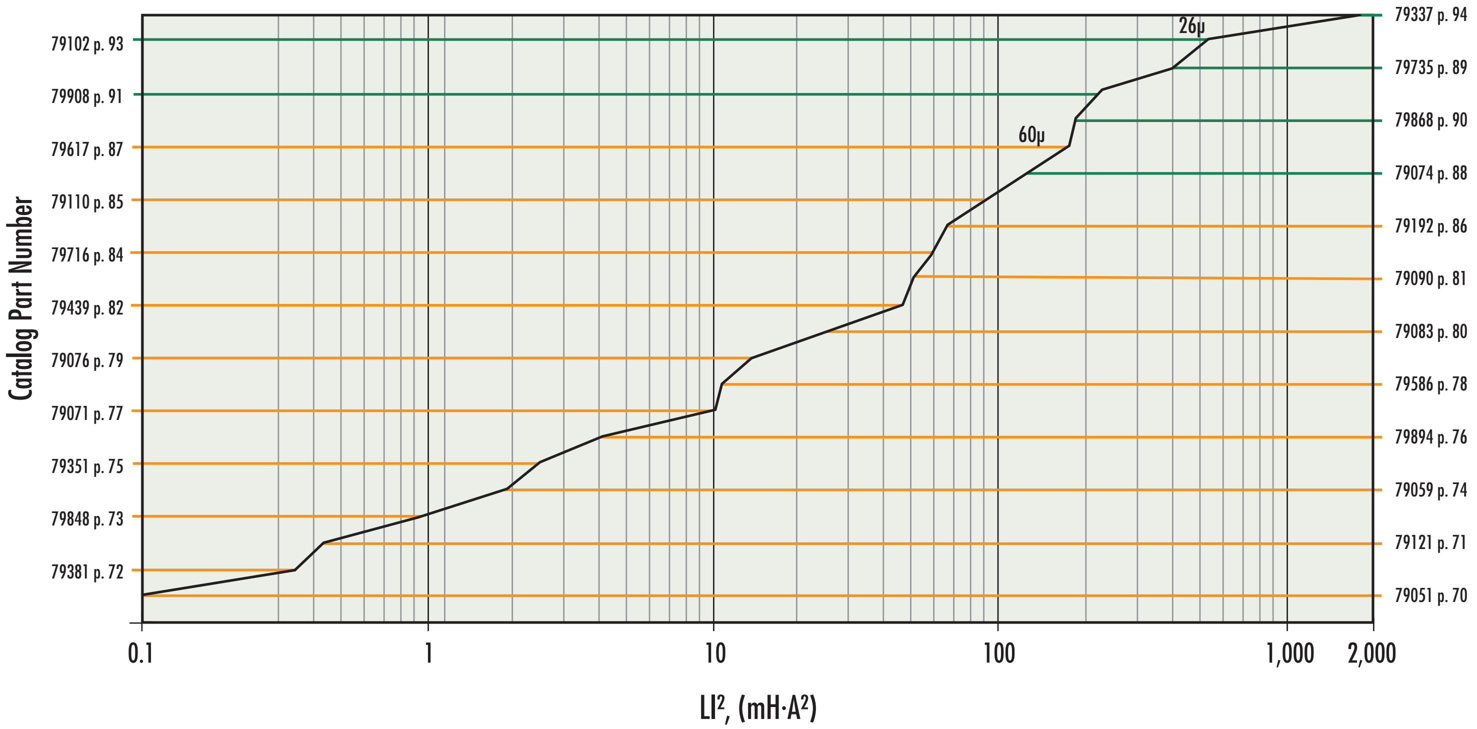


XFlux® Toroids

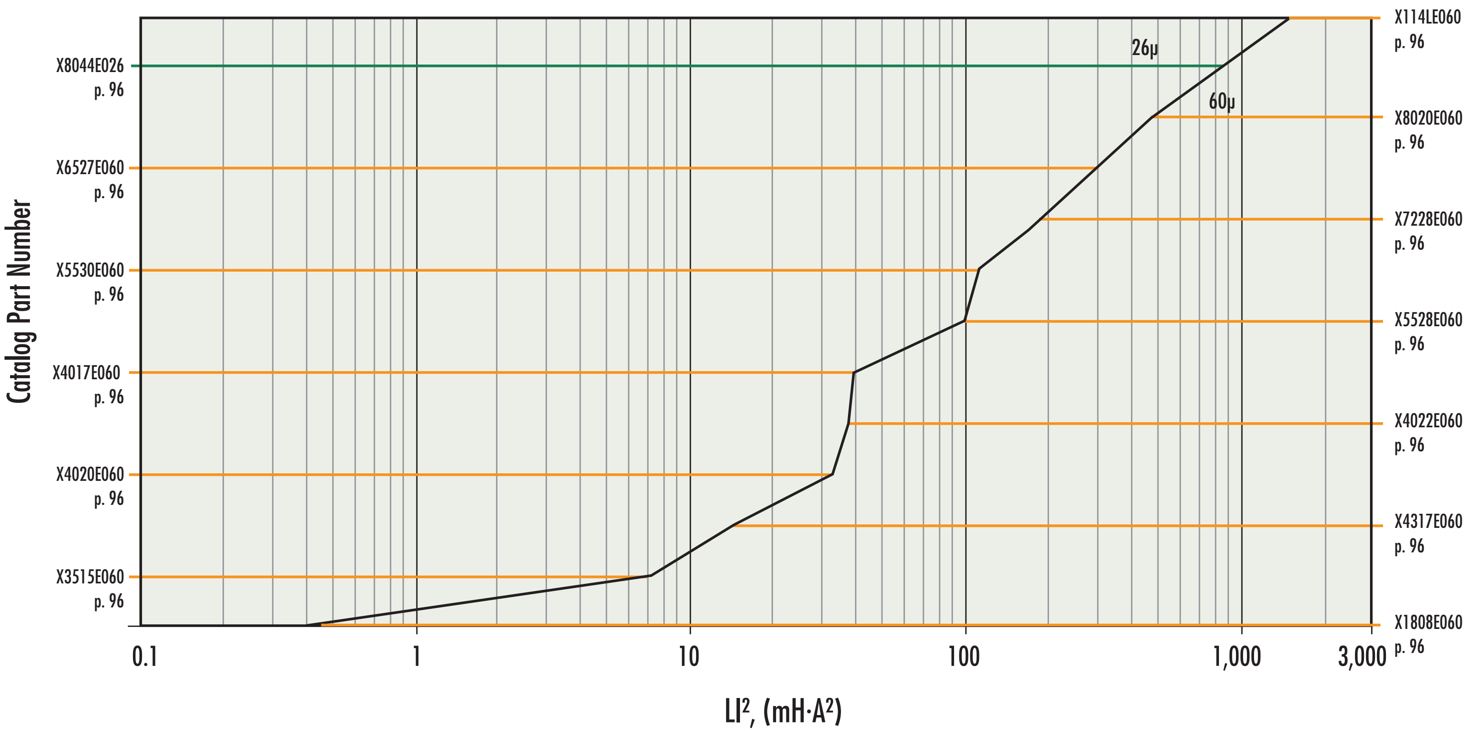


Core Selector Charts

Kool Mμ® MAX Toroids

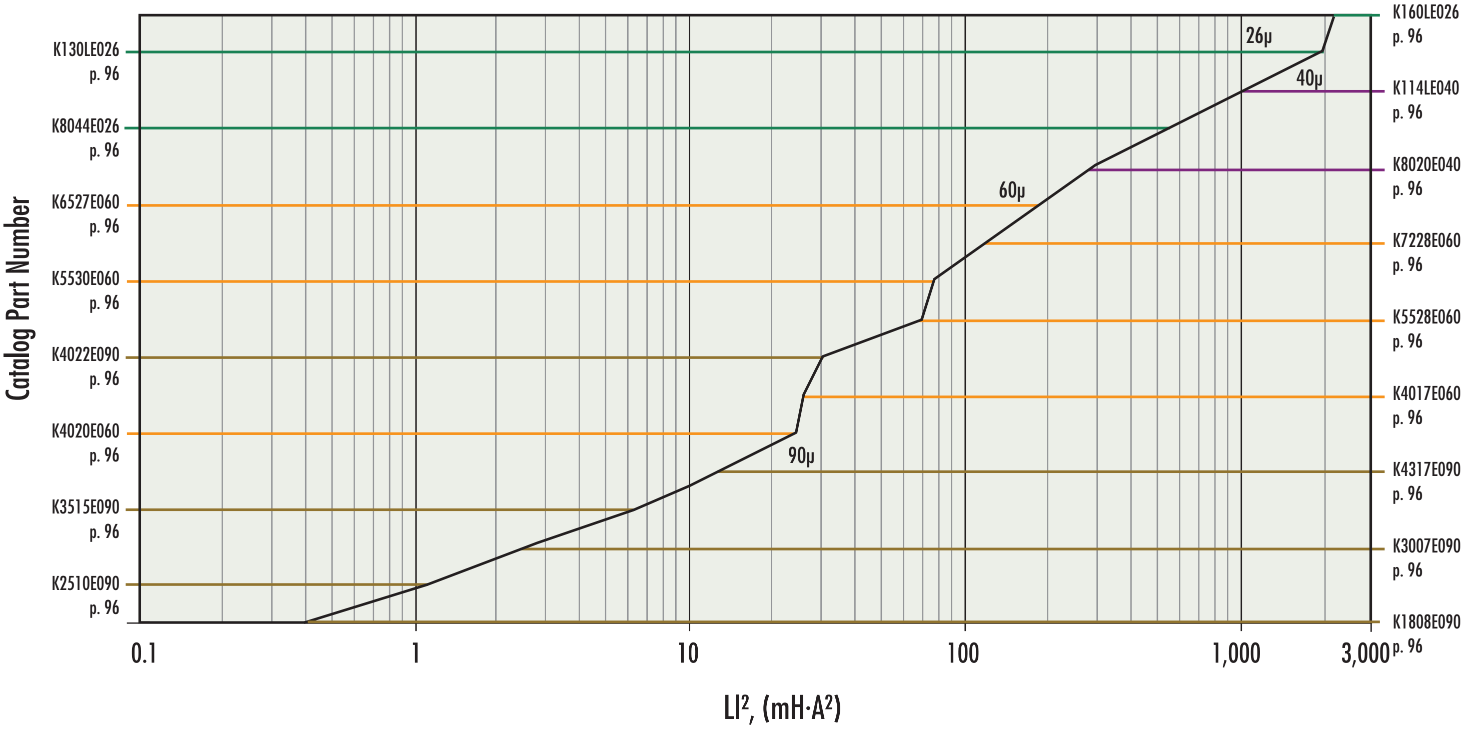


XFlux® E Cores

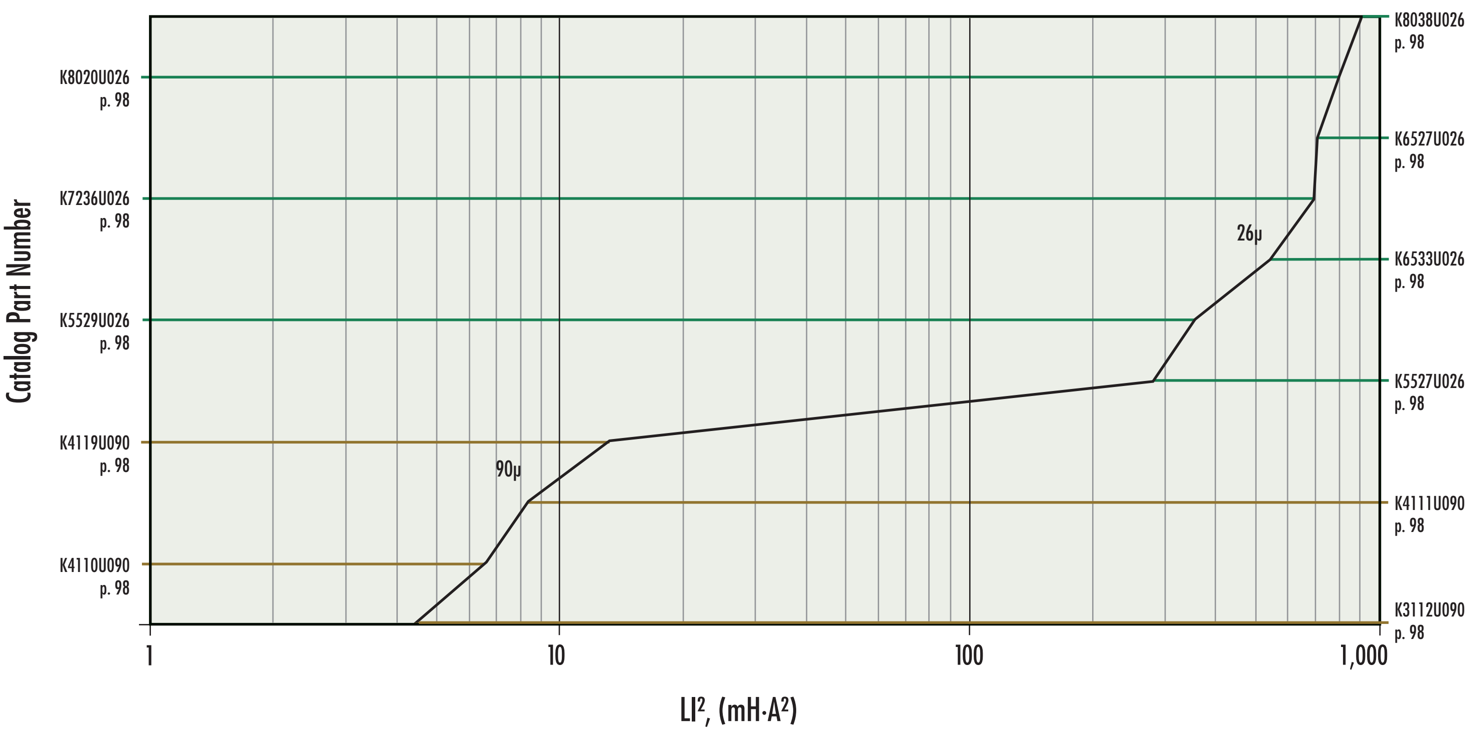


Core Selector Charts

Kool Mµ® E Cores



Kool Mµ® U Cores



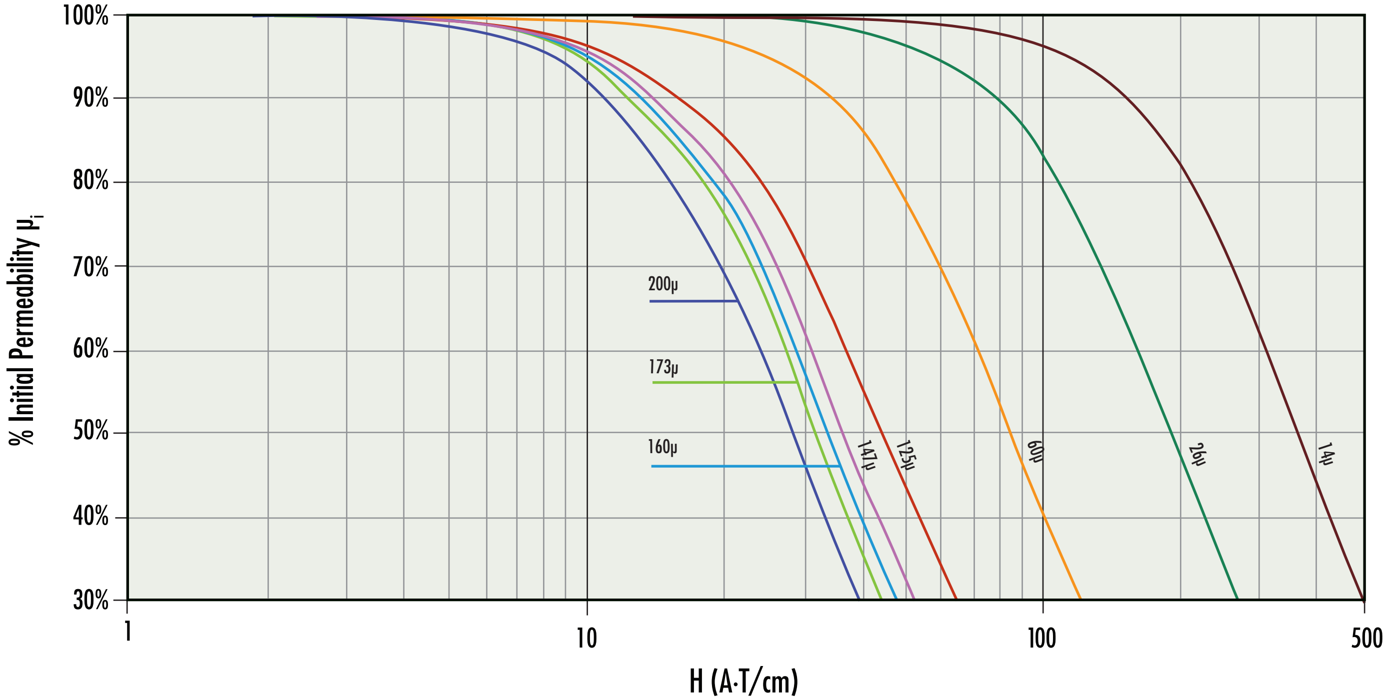
Wire Table

AWG Wire Size	Resistance Ω/meter	Wire O.D. (cm) Heavy Build	Wire Area cm^2	Current Capacity, Amps (listed by columns of Amps/cm^2)				
				200	400	500	600	800
6	.00130	.421	0.1392	26.6	53.2	66.5	79.8	106
7	.00163	.376	0.1110	21.1	42.2	52.8	63.3	84.4
8	.00206	.336	0.0887	16.7	33.5	41.8	50.2	66.9
9	.00260	.299	0.0702	13.3	26.5	33.2	39.8	53.1
10	.00328	.267	0.0560	10.5	21.0	26.3	31.6	42.1
11	.00414	.238	0.0445	8.34	16.7	20.8	25.0	33.3
12	.00521	.213	0.0356	6.62	13.2	16.5	19.8	26.5
13	.00656	.1902	0.0284	5.25	10.5	13.1	15.8	21.0
14	.00828	.1715	0.0231	4.16	8.33	10.4	12.5	16.7
15	.01044	.1529	0.01840	3.30	6.61	8.26	9.91	13.2
16	.01319	.1369	0.01472	2.62	5.23	6.54	7.85	10.5
17	.01658	.1224	0.01177	2.08	4.16	5.20	6.24	8.32
18	.02095	.1095	0.00942	1.65	3.29	4.11	4.94	6.58
19	.02640	.0980	0.00754	1.31	2.61	3.27	3.92	5.22
20	.03323	.0879	0.00607	1.04	2.08	2.59	3.11	4.15
21	.04190	.0785	0.00484	0.823	1.65	2.06	2.47	3.29
22	.05315	.0701	0.00386	0.649	1.30	1.62	1.95	2.59
23	.06663	.0632	0.00314	0.518	1.04	1.29	1.55	2.07
24	.08422	.0566	0.00252	0.409	0.819	1.0236	1.23	1.64
25	.10620	.0505	0.00200	0.325	0.649	0.812	0.974	1.30
26	.13458	.0452	0.00160	0.256	0.512	0.641	0.769	1.02
27	.16873	.0409	0.00131	0.204	0.409	0.511	0.613	0.817
28	0.214	.0366	0.00105	0.161	0.322	0.402	0.483	0.644
29	0.266	.0330	0.000855	0.129	0.259	0.324	0.388	0.518
30	0.340	.0295	0.000683	0.101	0.203	0.253	0.304	0.405
31	0.429	.0267	0.000560	0.0803	0.161	0.201	0.241	0.321
32	0.532	.0241	0.000456	0.0649	0.130	0.162	0.195	0.259
33	0.675	.0216	0.000366	0.0511	0.102	0.128	0.153	0.204
34	0.857	.01905	0.000285	0.0402	0.0804	0.101	0.121	0.161
35	1.085	.01702	0.000228	0.0318	0.0636	0.0795	0.0953	0.127
36	1.361	.01524	0.000182	0.0253	0.0507	0.0633	0.0760	0.101
37	1.680	.01397	0.000153	0.0205	0.0410	0.0513	0.0616	0.0821
38	2.13	.01245	0.000122	0.0162	0.0324	0.0405	0.0486	0.0649
39	2.78	.01092	0.000094	0.0124	0.0248	0.0310	0.0372	0.0497
40	3.54	.00965	0.000073	0.00974	0.0195	0.0243	0.0292	0.0390
41	4.34	.00864	0.000059	0.00795	0.0159	0.0199	0.0238	0.0318
42	5.44	.00762	0.000046	0.00633	0.0127	0.0158	0.0190	0.0253
43	7.03	.00686	0.000037	0.00490	0.00981	0.0123	0.0147	0.0196
44	8.51	.00635	0.000032	0.00405	0.00811	0.0101	0.0122	0.0162
45	10.98	.00546	0.000023	0.00314	0.00628	0.00785	0.00942	0.0126
46	13.80	.00498	0.000019	0.00250	0.00500	0.00624	0.00749	0.00999
47	17.36	.00452	0.000016	0.00199	0.00397	0.00497	0.00596	0.00795
48	22.10	.00394	0.000012	0.00156	0.00312	0.00390	0.00467	0.00623
49	27.60	.00353	0.000010	0.00125	0.00250	0.00312	0.00375	0.00499

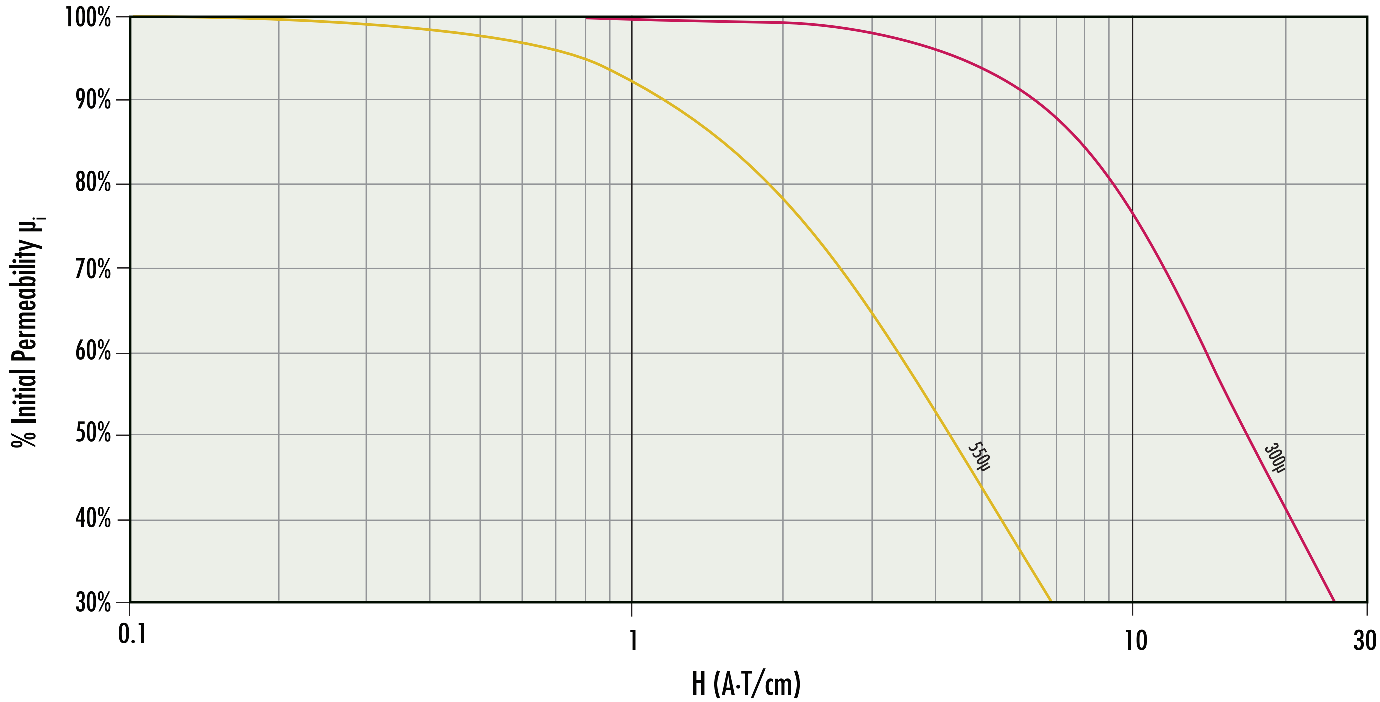
MAGNETICS®

Permeability versus DC Bias Curves

MPP Toroids 14µ - 200µ

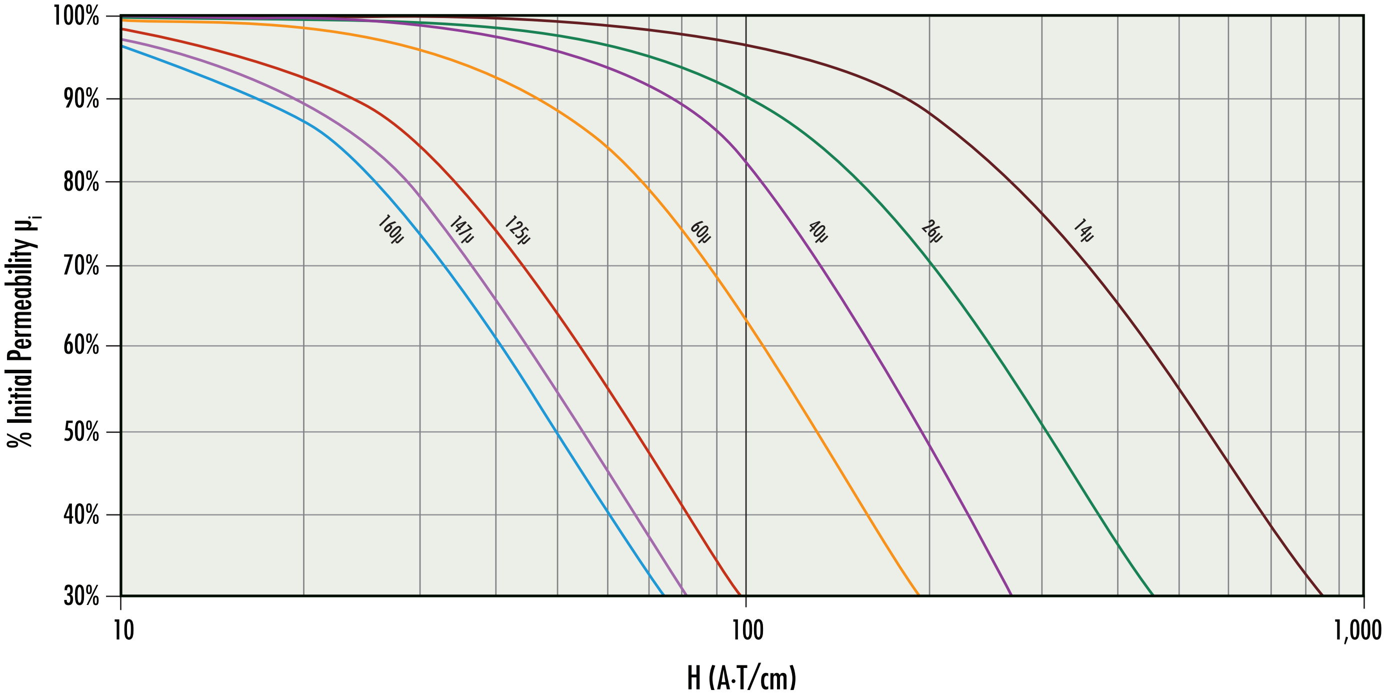


MPP Toroids 300µ & 550µ

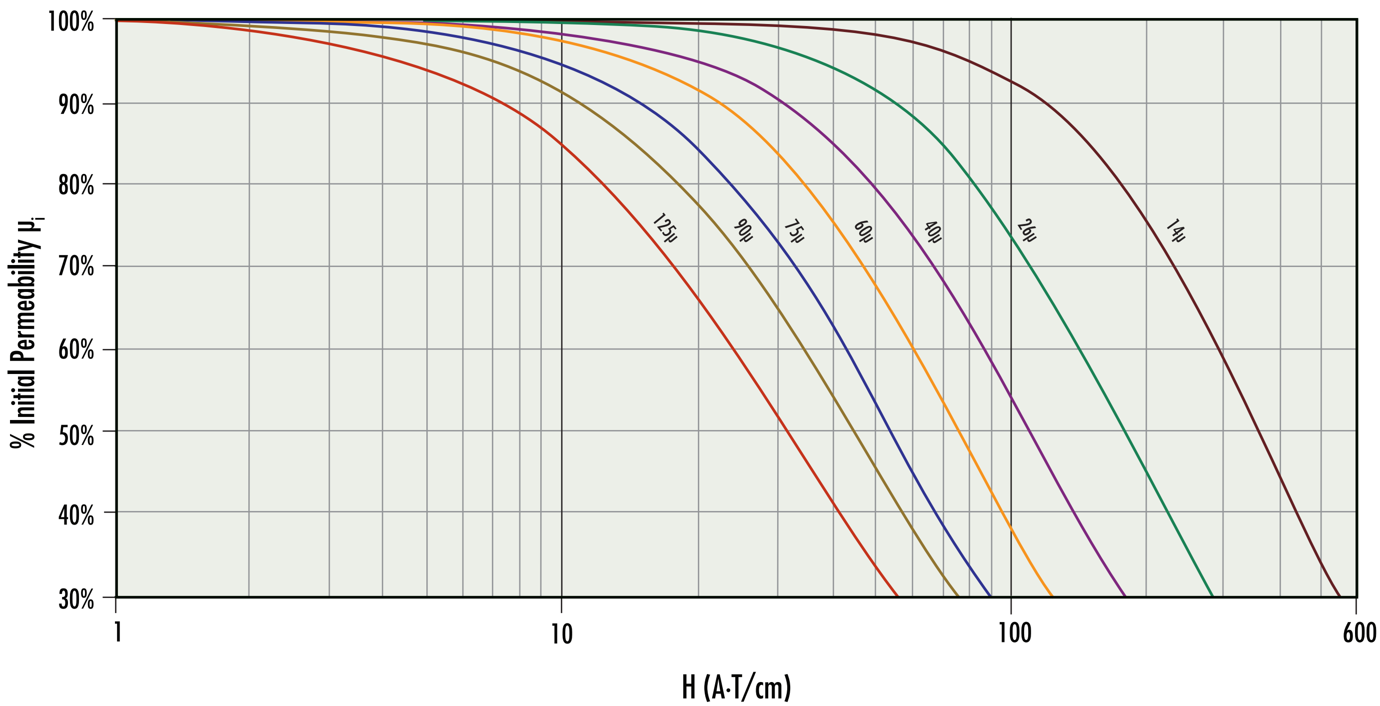


Permeability versus DC Bias Curves

High Flux Toroids

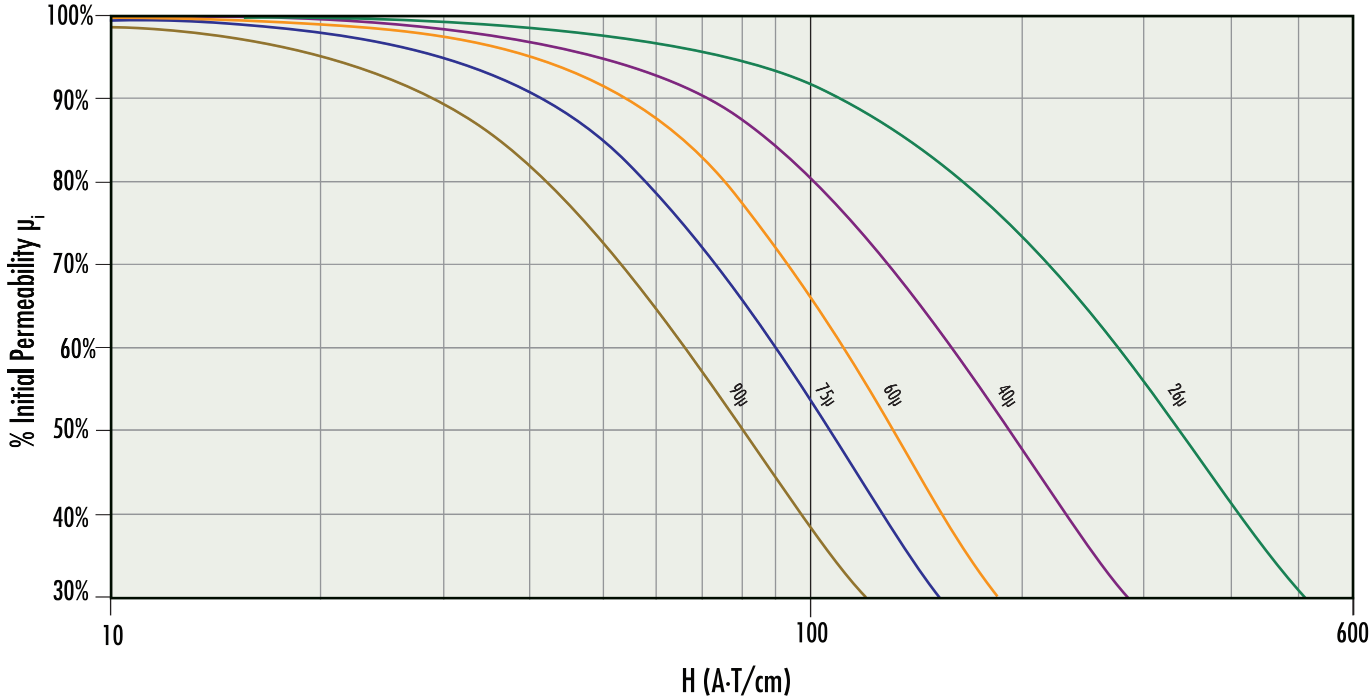


Kool Mμ® Toroids

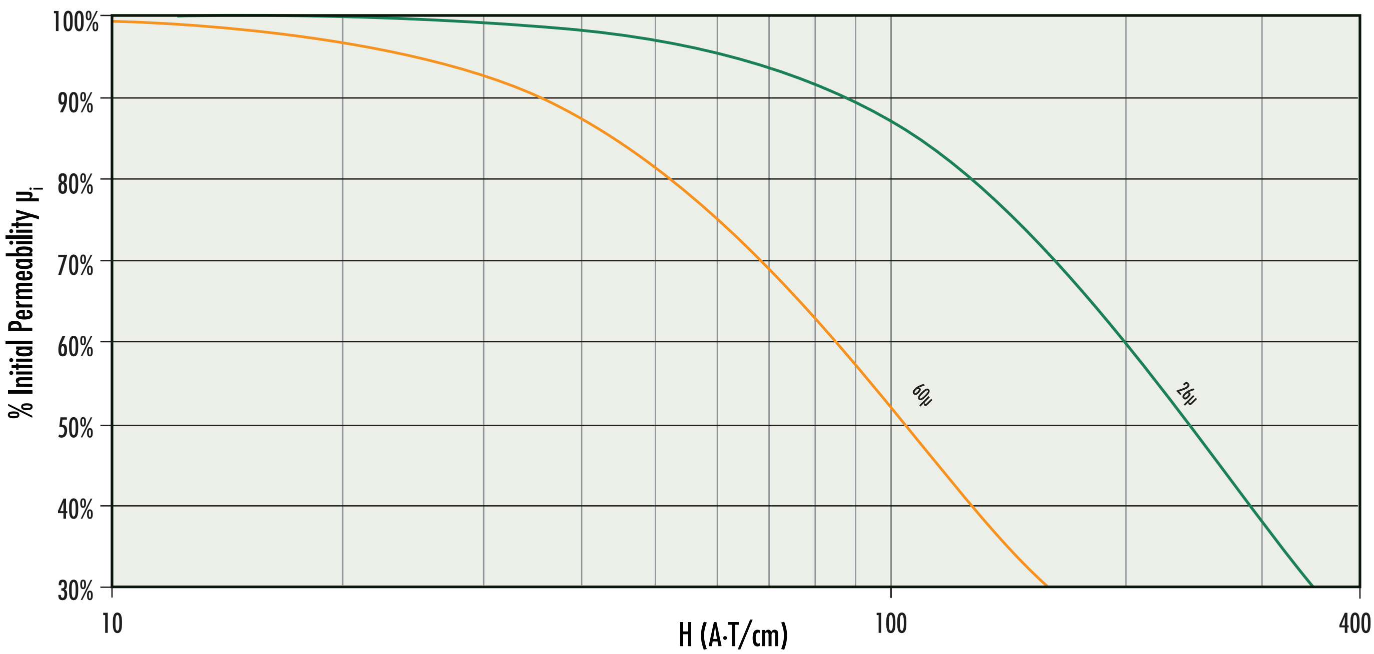


Permeability versus DC Bias Curves

XFlux® Toroids

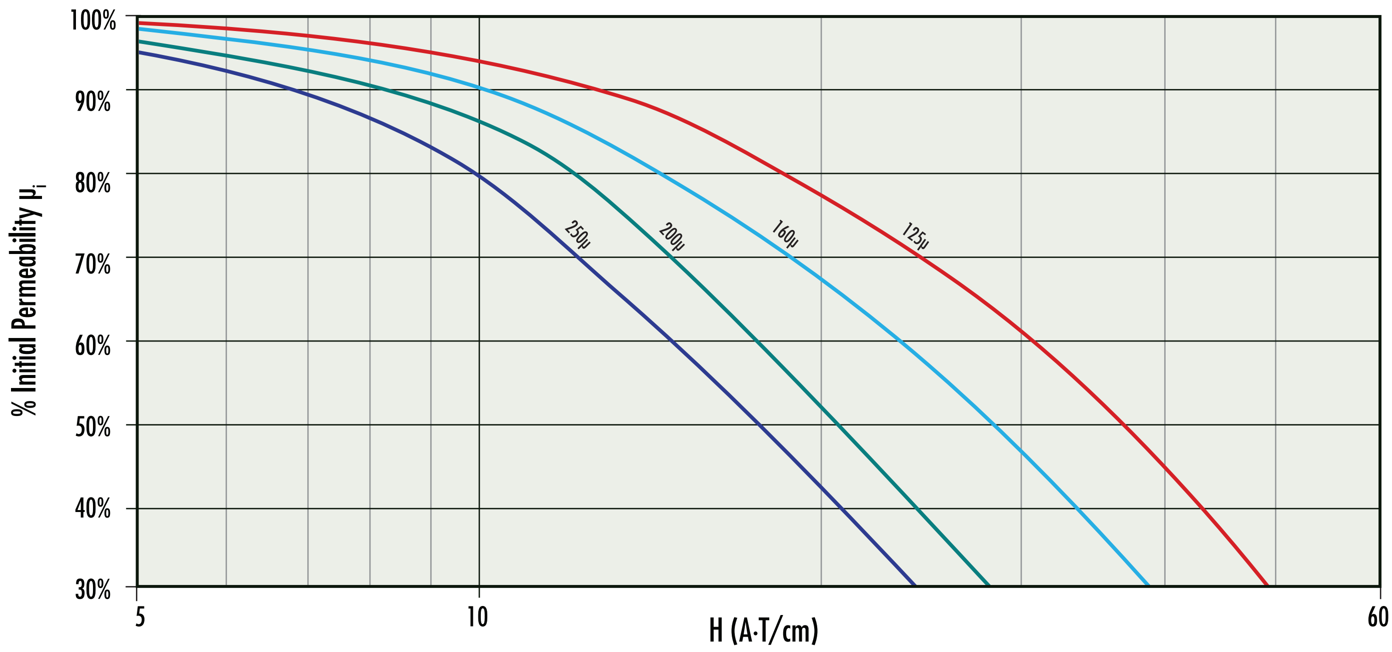


Kool Mμ® MAX Toroids

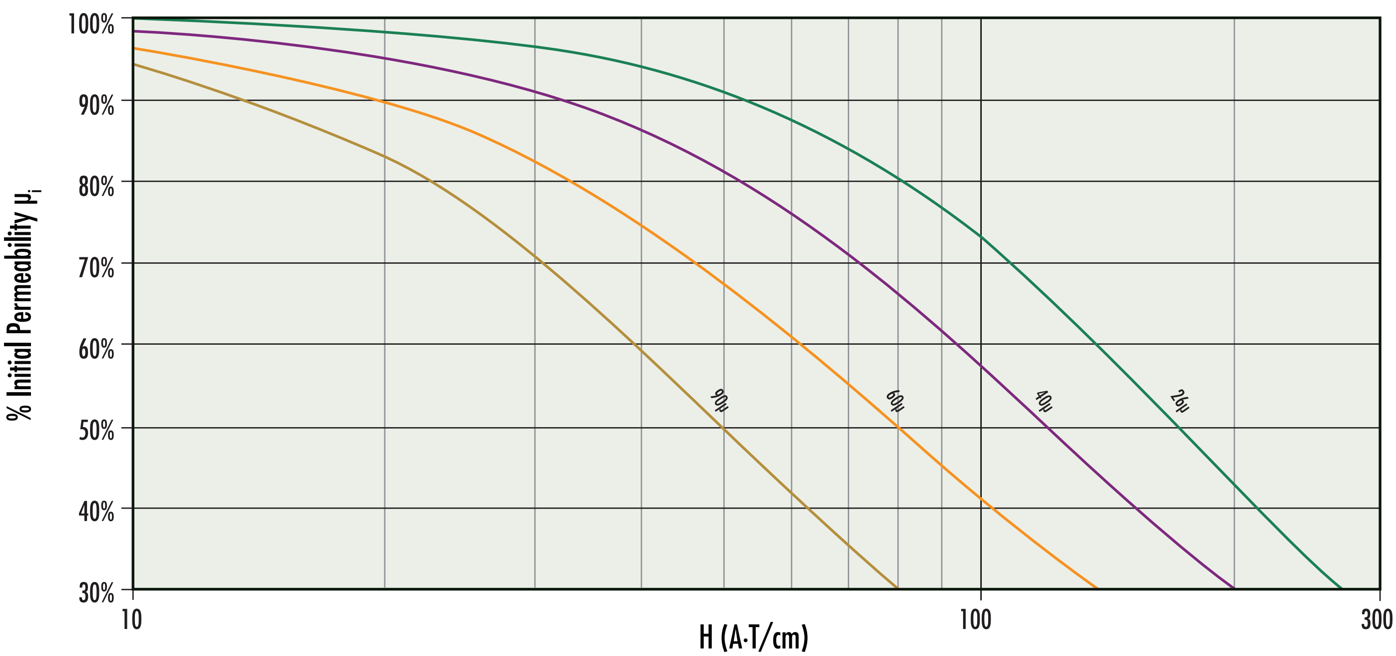


Permeability versus DC Bias Curves

MPP THINZ®

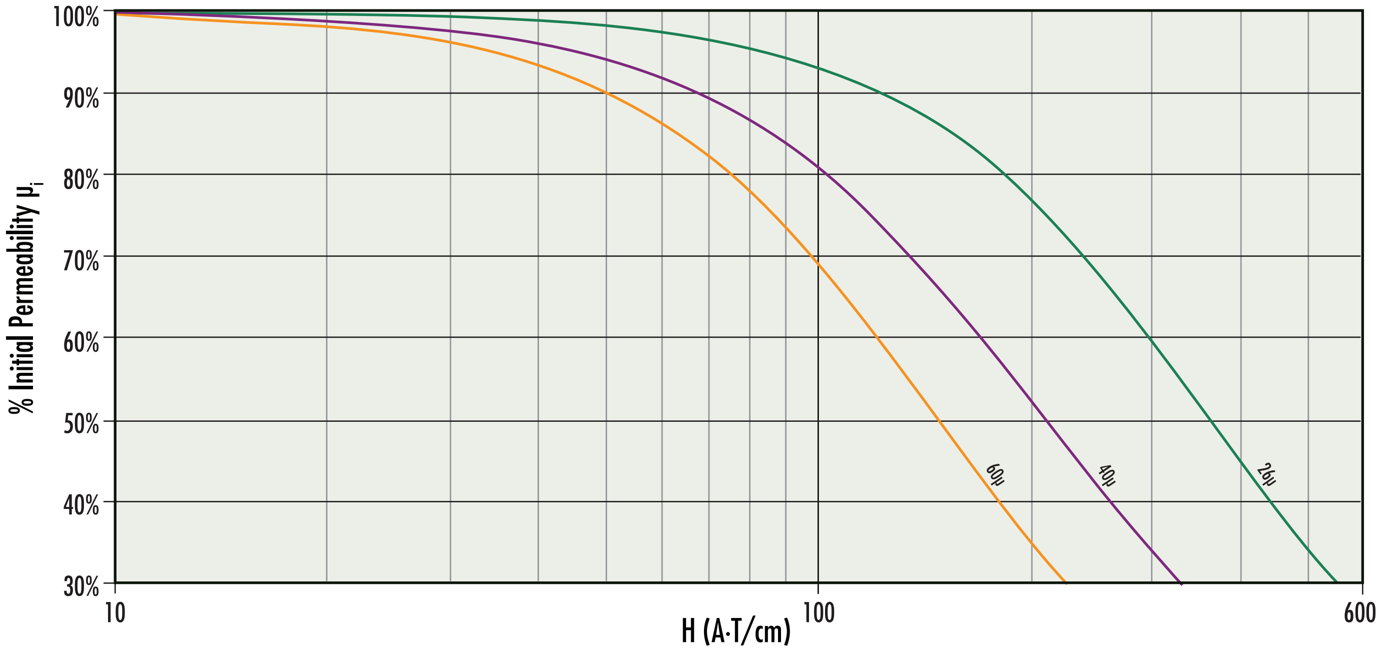


Kool Mμ® Shapes



Permeability versus DC Bias Curves

XFLUX® Shapes



Permeability versus DC Bias Curves

Fit Formula

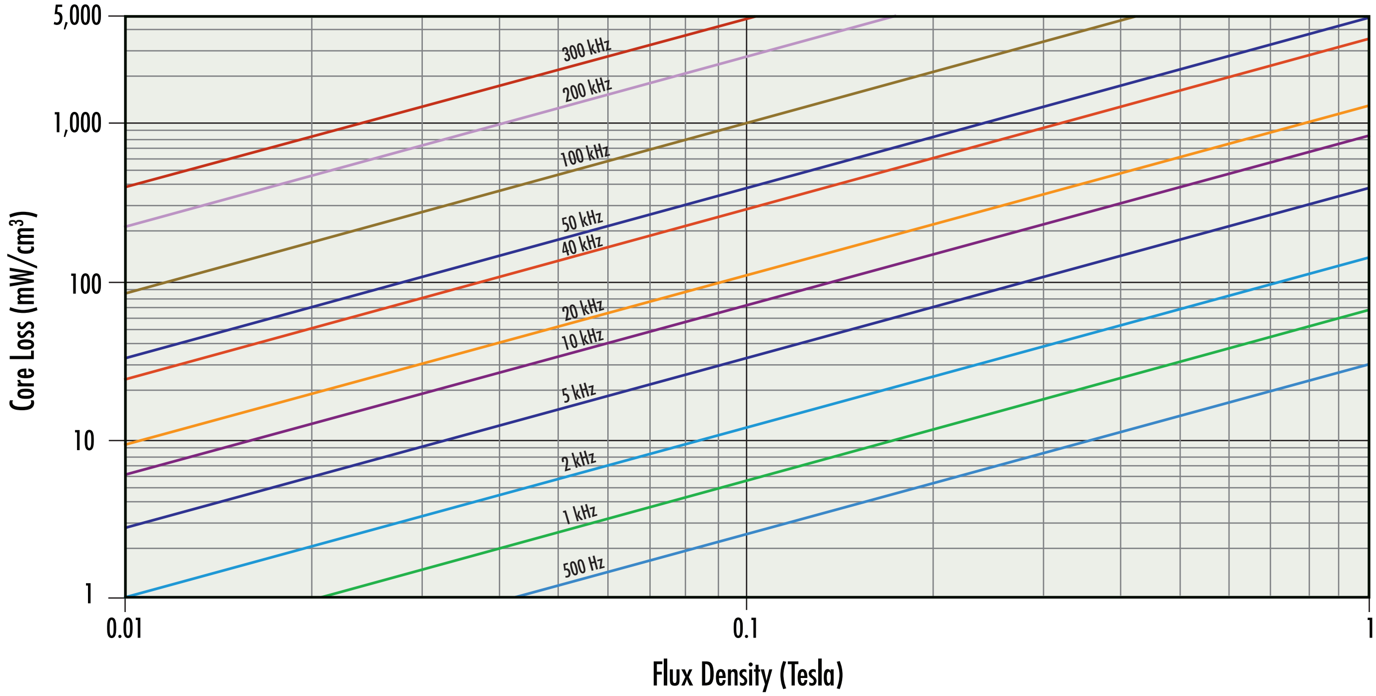
$$\text{\% initial permeability} = \frac{1}{(a + bH^c)}$$ Units in A•T/cm

	Perm	a	b	c
MPP	14µ	0.01	2.435E-09	2.596
	26µ	0.01	1.931E-08	2.505
	60µ	0.01	2.033E-07	2.436
	125µ	0.01	1.963E-06	2.253
	147µ	0.01	1.588E-06	2.430
	160µ	0.01	1.677E-06	2.477
	173µ	0.01	1.451E-06	2.563
	200µ	0.01	2.635E-06	2.477
	300µ	0.01	1.852E-05	2.216
	550µ	0.01	8.271E-04	1.710
Kool Mµ®	14µ	0.01	8.220E-08	1.990
	26µ	0.01	7.979E-07	1.819
	40µ	0.01	3.213E-06	1.704
	60µ	0.01	5.184E-06	1.749
	75µ	0.01	1.272E-05	1.664
	90µ	0.01	2.698E-05	1.558
	125µ	0.01	6.345E-05	1.462
High Flux	14µ	0.01	4.550E-08	1.948
	26µ	0.01	7.178E-08	2.069
	40µ	0.01	3.192E-08	2.409
	60µ	0.01	2.582E-07	2.166
	125µ	0.01	1.458E-06	2.108
	147µ	0.01	1.964E-06	2.131
	160µ	0.01	2.749E-06	2.094
XFlux®	26µ	0.01	1.014E-07	1.976
	40µ	0.01	9.786E-08	2.188
	60µ	0.01	4.795E-08	2.511
	75µ	0.01	2.073E-07	2.306
	90µ	0.01	8.021E-07	2.150
Kool Mµ® MAX	26µ	0.01	5.700E-08	2.205
	60µ	0.01	9.344E-07	2.000
Kool Mµ® Shapes	26µ	0.01	6.615E-07	1.874
	40µ	0.01	3.627E-06	1.656
	60µ	0.01	1.108E-05	1.555
	90µ	0.01	1.115E-05	1.744
XFlux® Shapes	26µ	0.01	5.560E-08	2.054
	40µ	0.01	3.206E-07	1.932
	60µ	0.01	3.570E-07	2.047

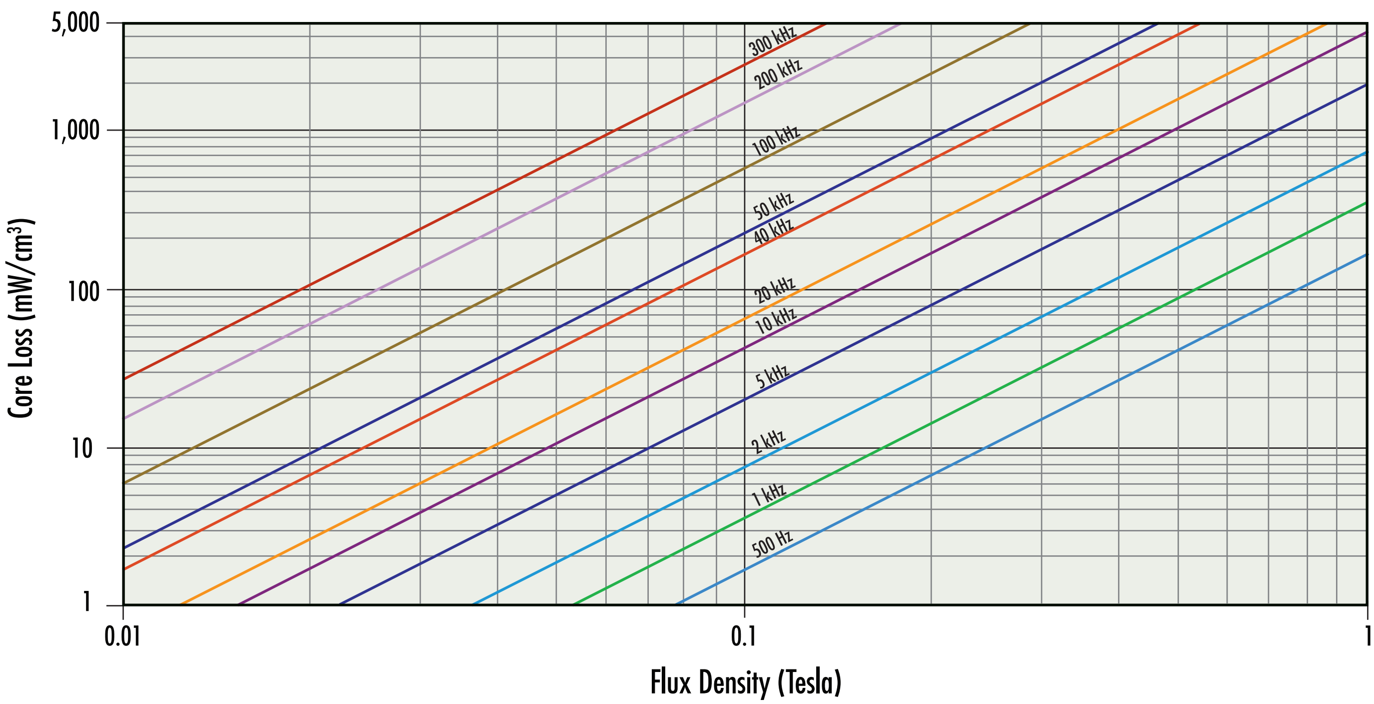
Note: all numbers calculated using A•T/cm   Fit valid only for range shown on graph

Core Loss Density Curves

MPP 14µ

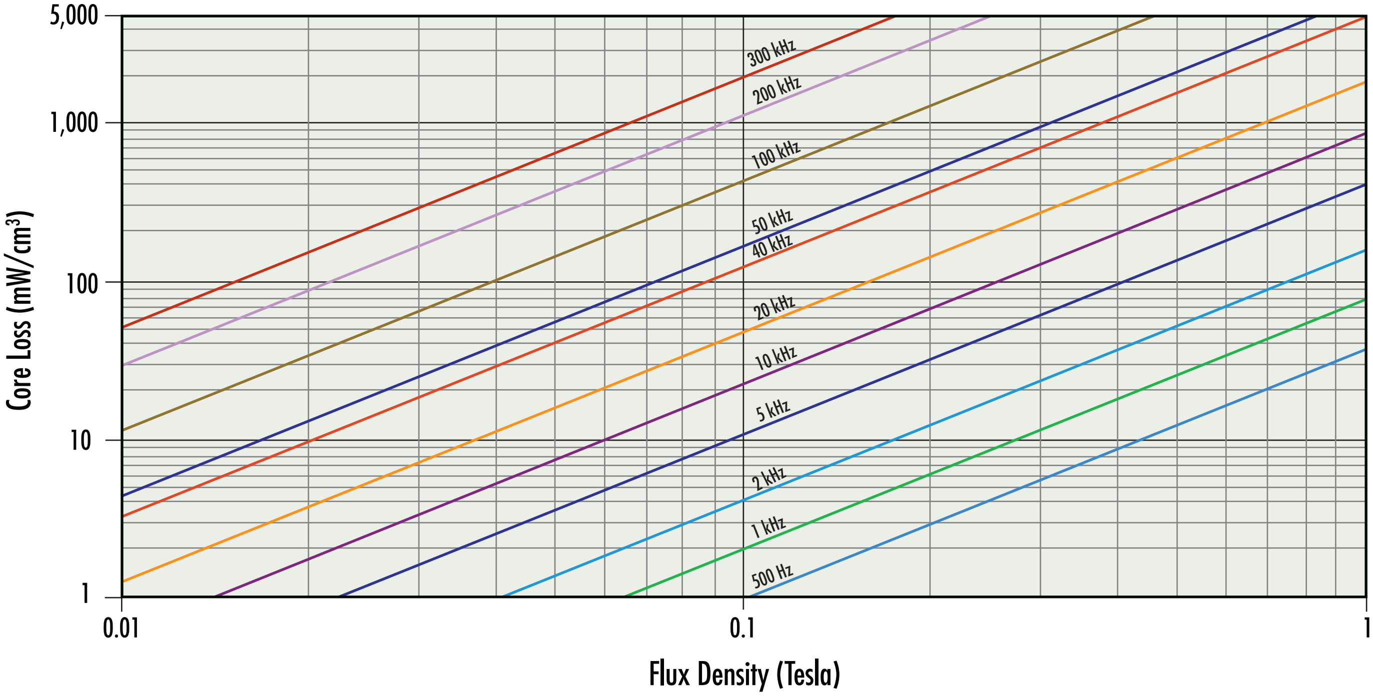


MPP 26µ

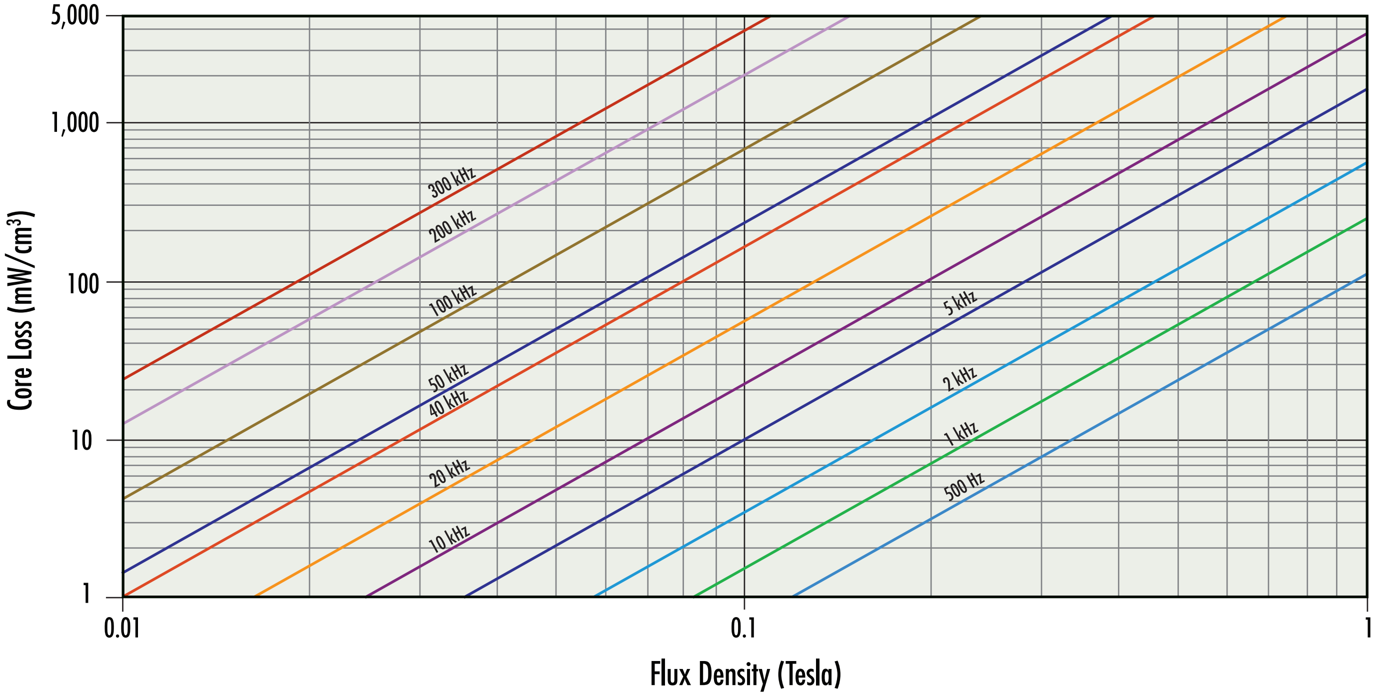


Core Loss Density Curves

MPP 60µ

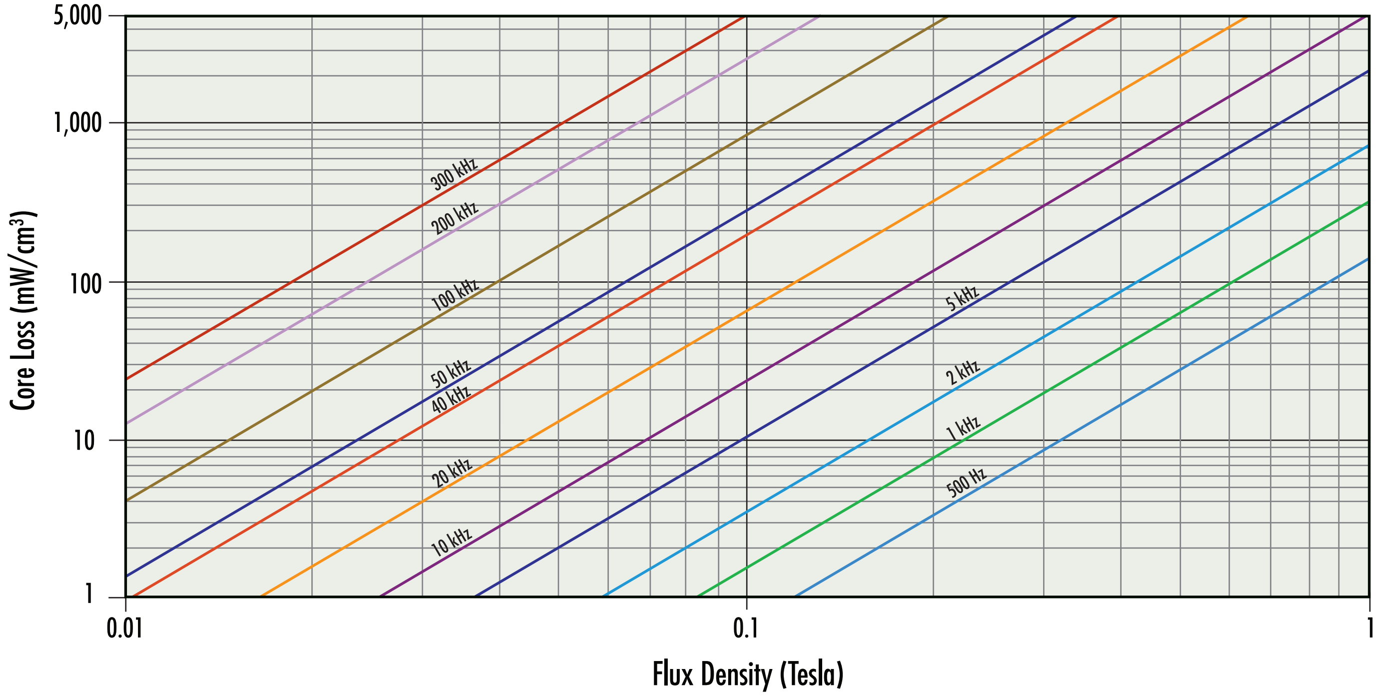


MPP 125µ, 147µ, 160µ, 173µ

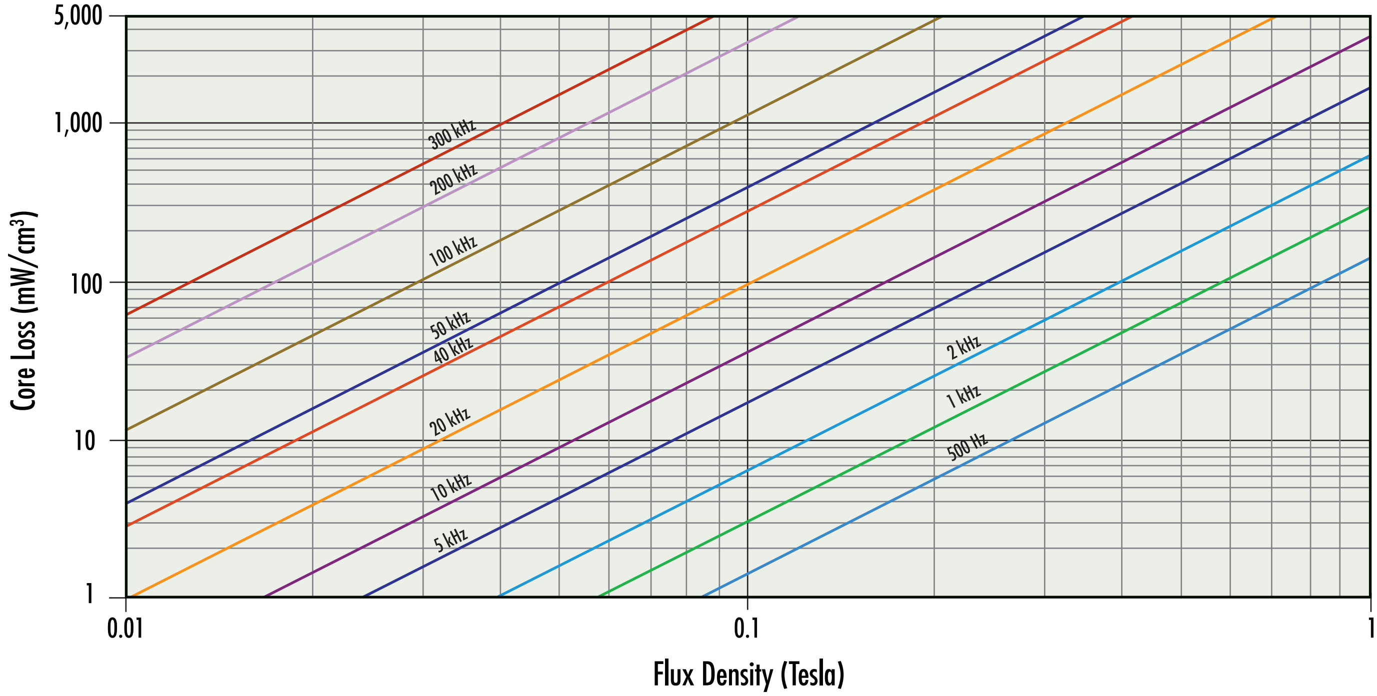


Core Loss Density Curves

MPP 200µ, 300µ

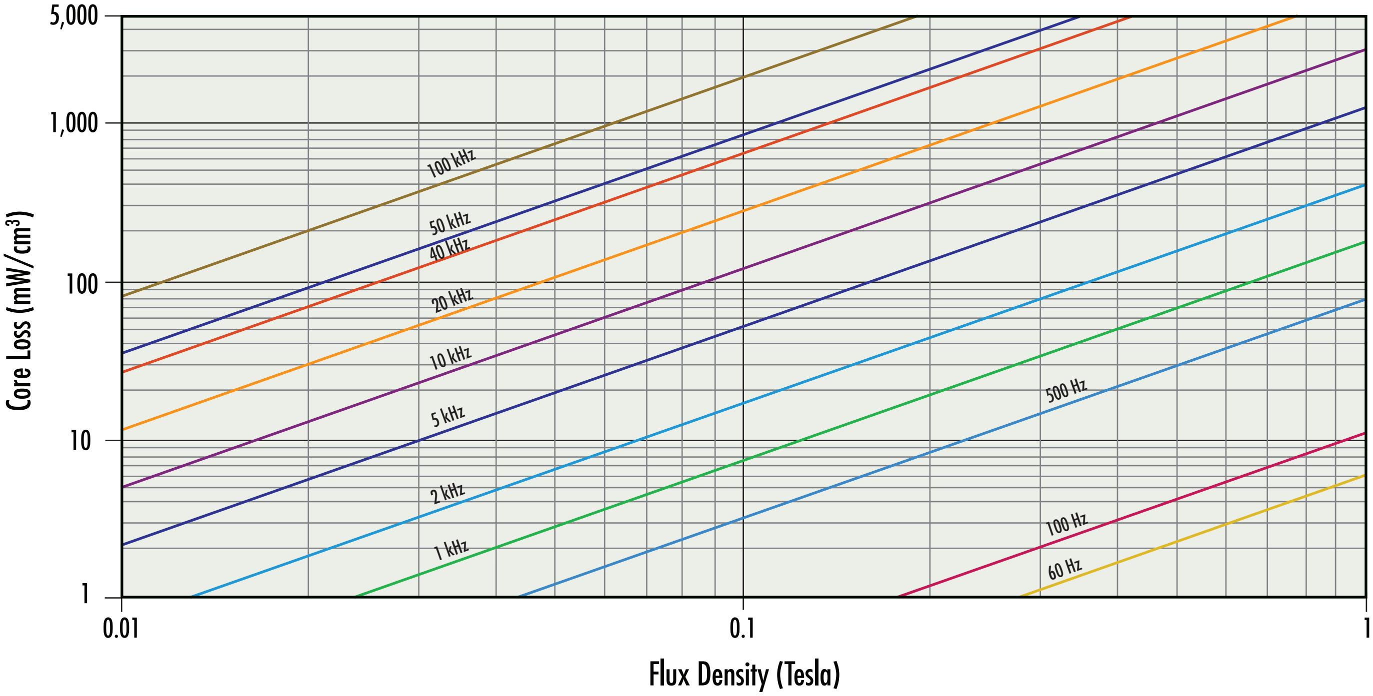


MPP 550µ

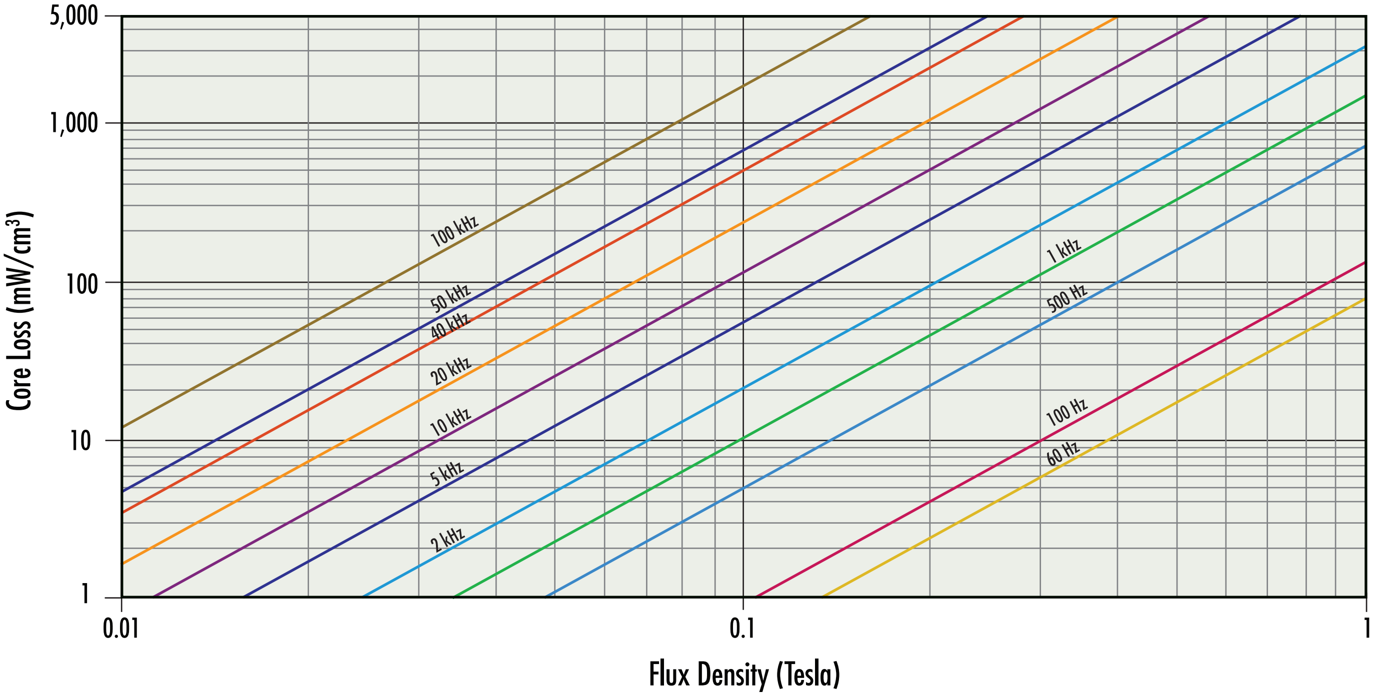


Core Loss Density Curves

High Flux 14µ

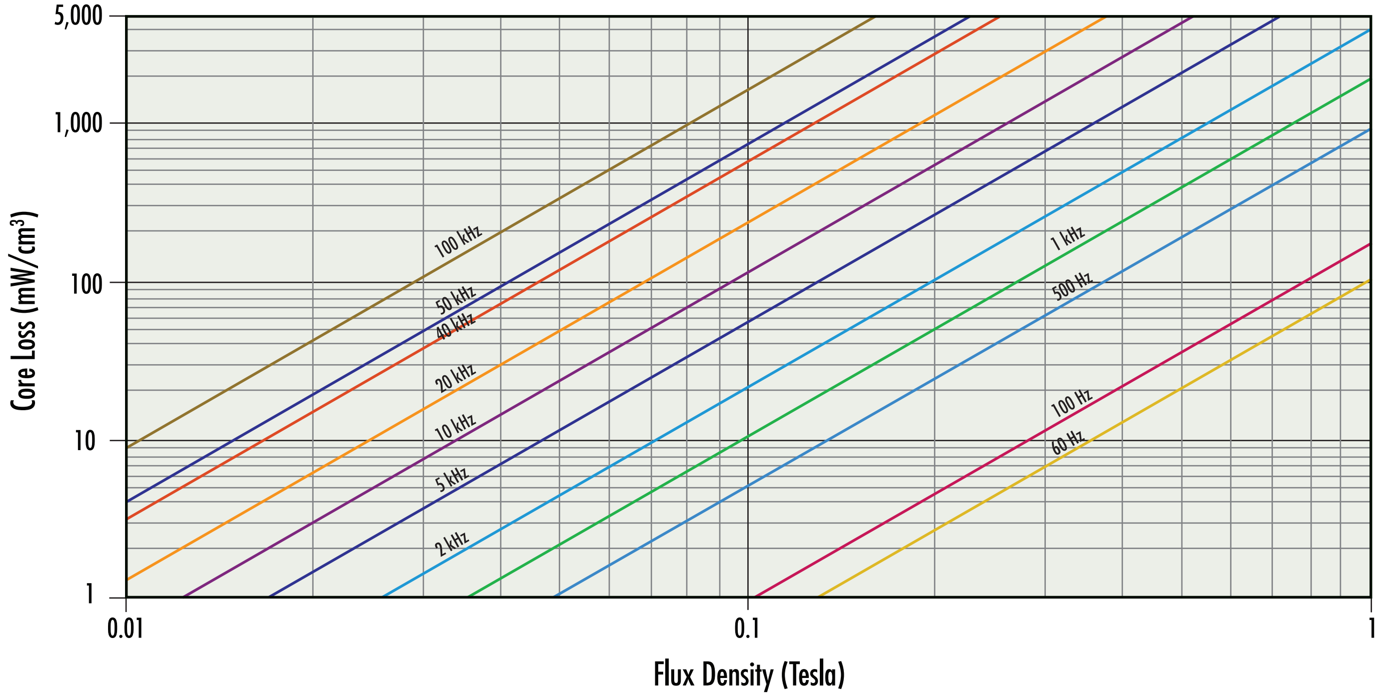


High Flux 26µ

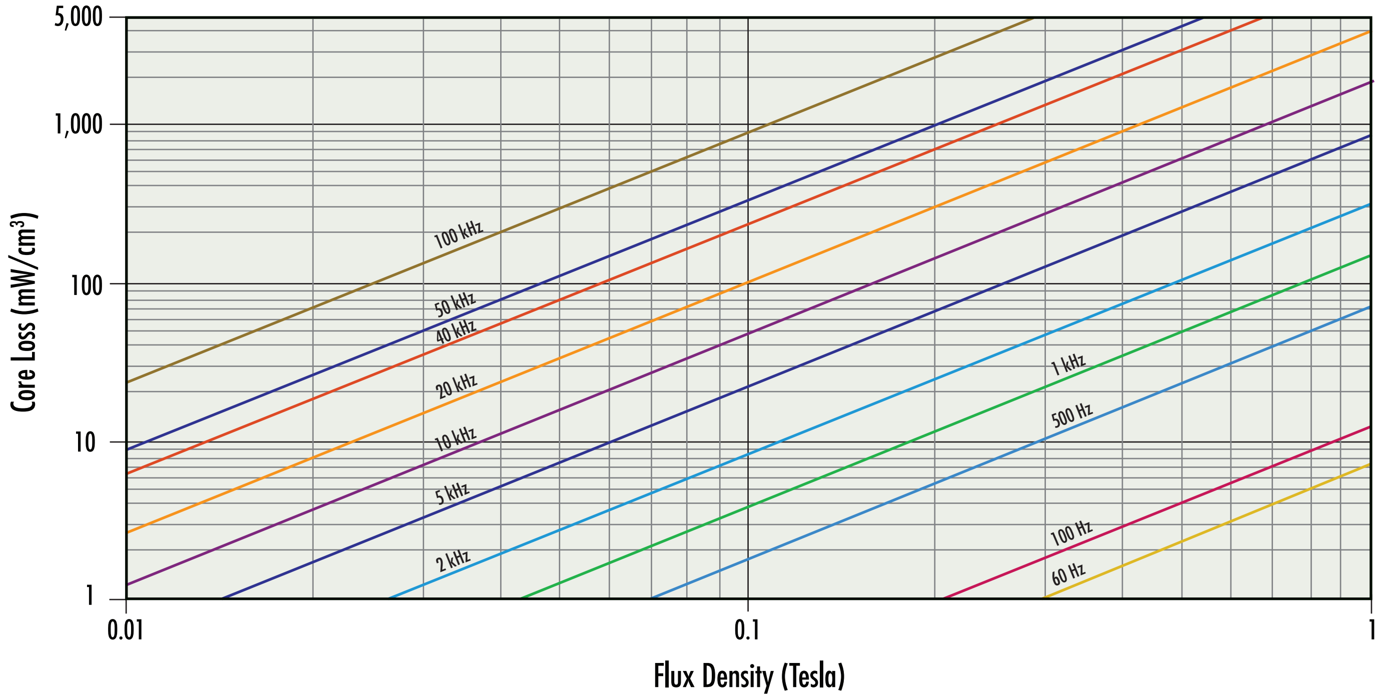


Core Loss Density Curves

High Flux 40µ

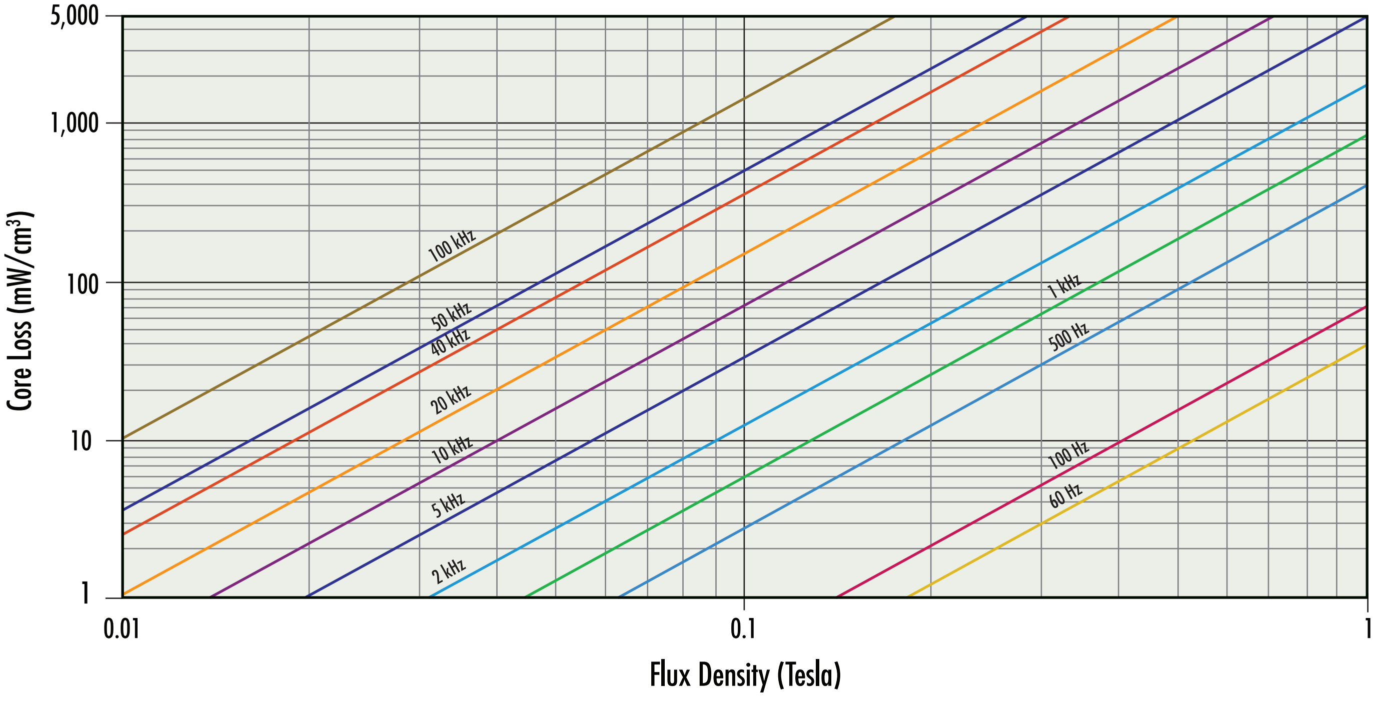


High Flux 60µ, 125µ

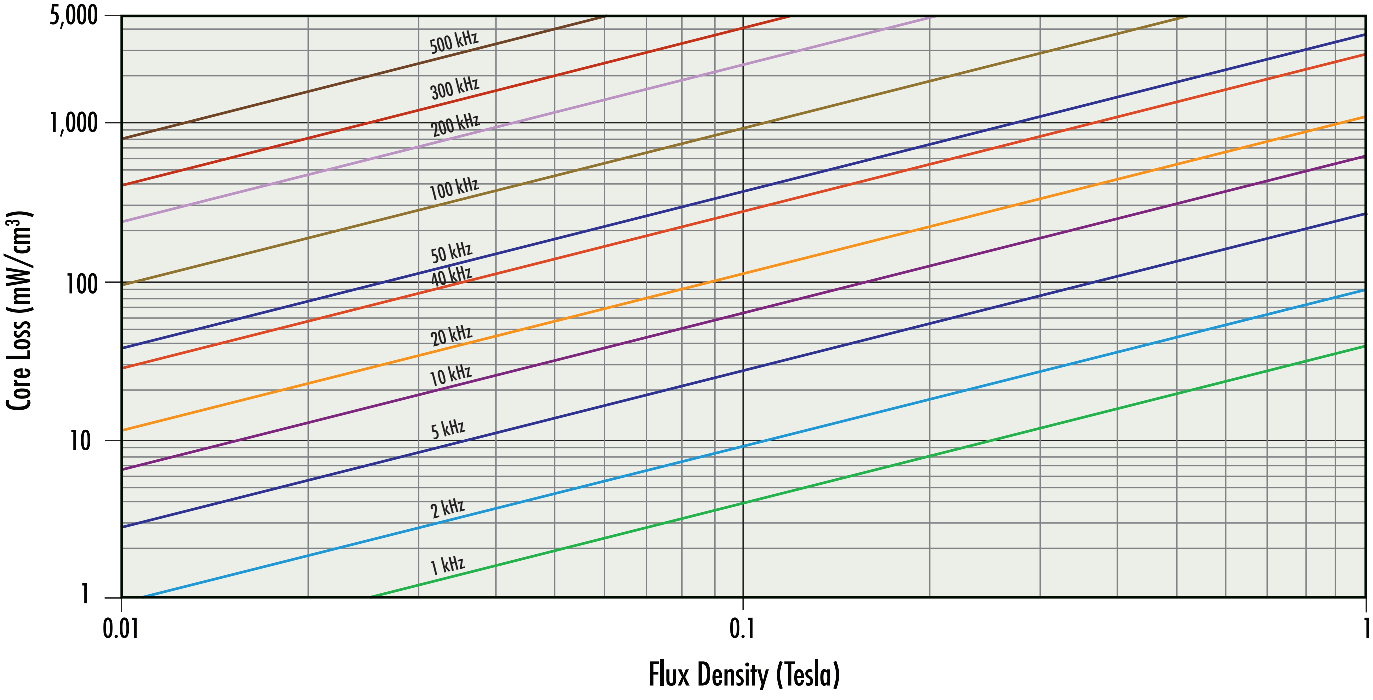


Core Loss Density Curves

High Flux 147µ, 160µ

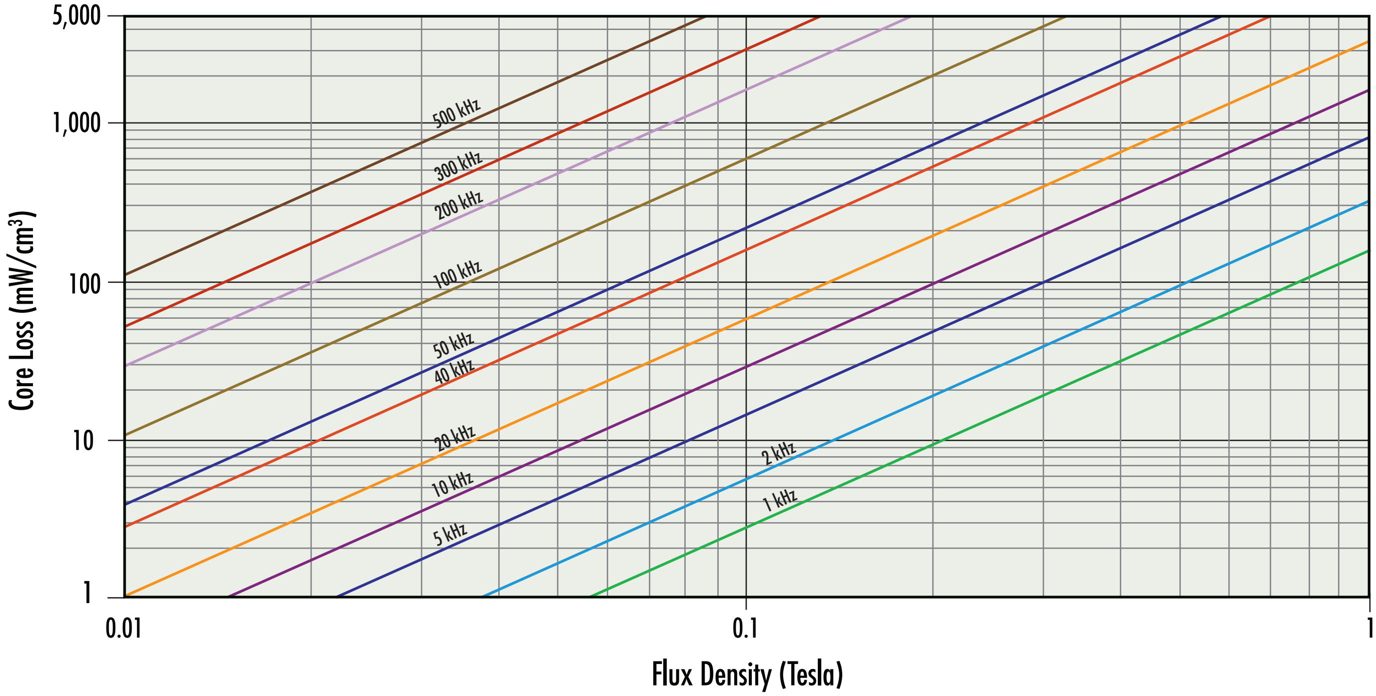


Kool Mµ® 14µ

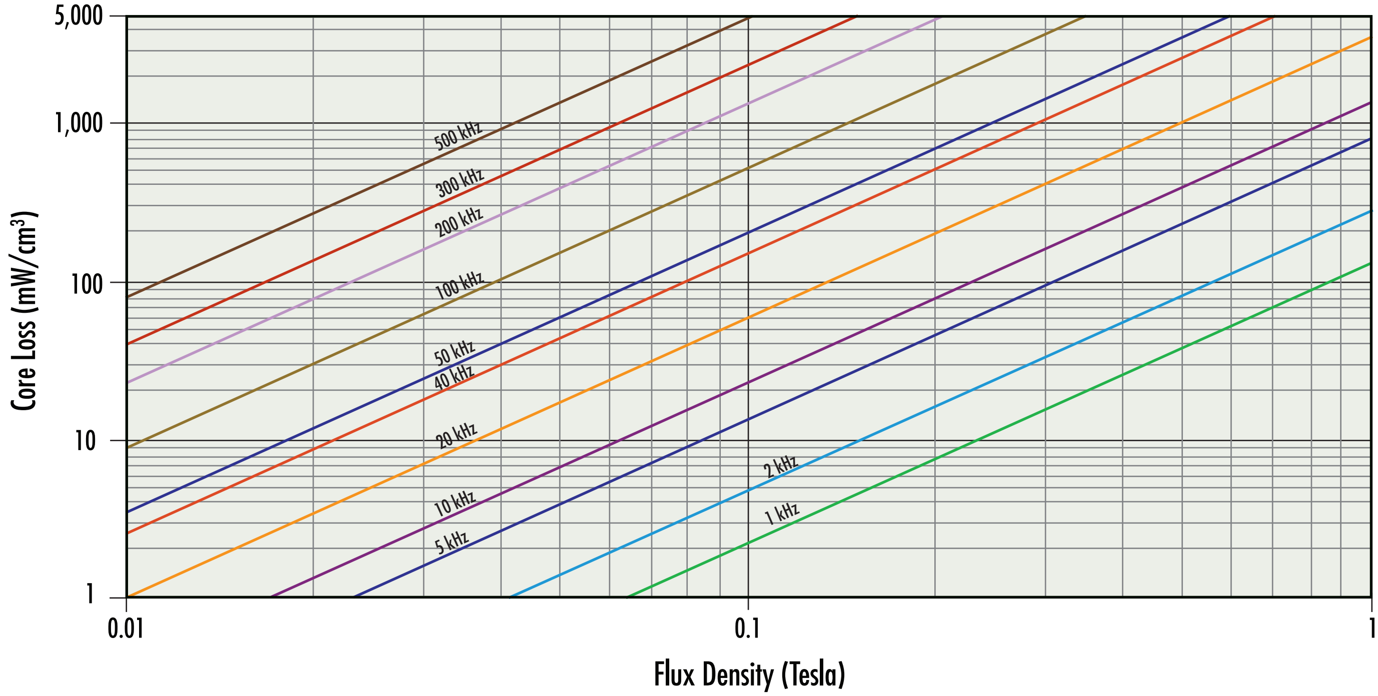


Core Loss Density Curves

Kool Mμ® 26μ, 40μ

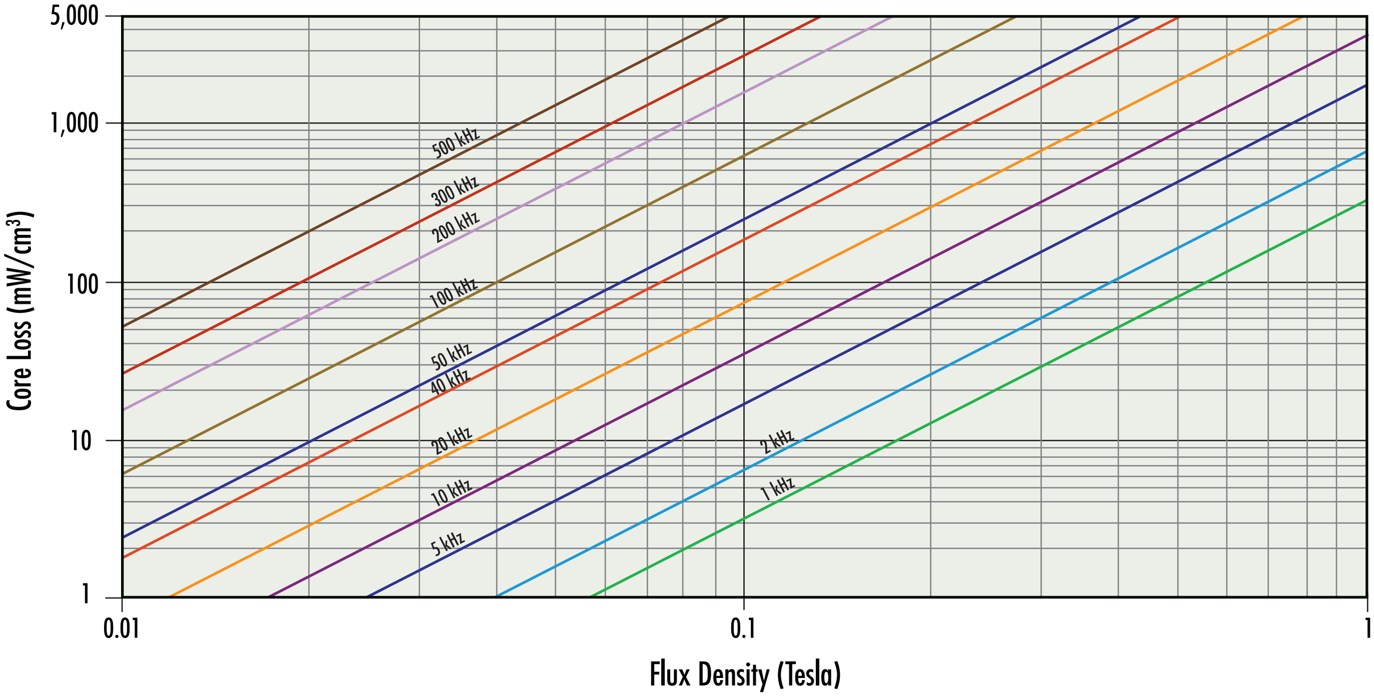


Kool Mμ® 60μ

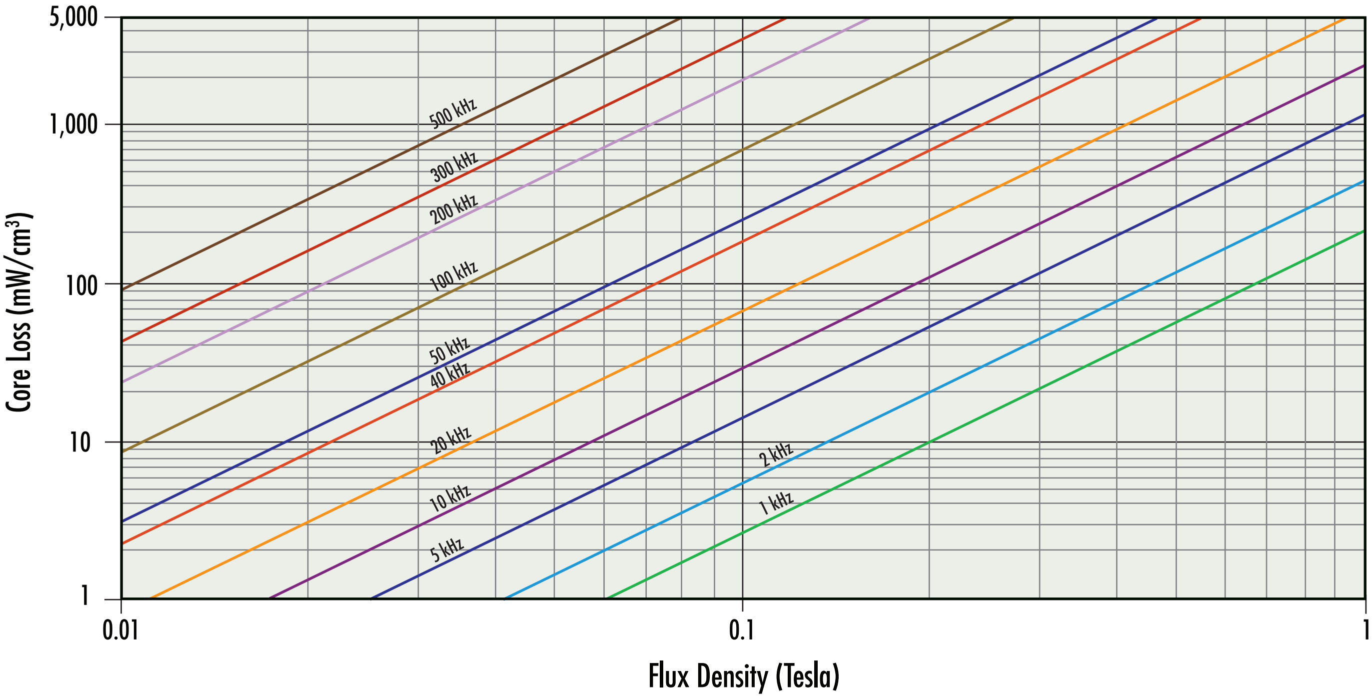


Core Loss Density Curves

Kool Mμ® 75μ, 90μ

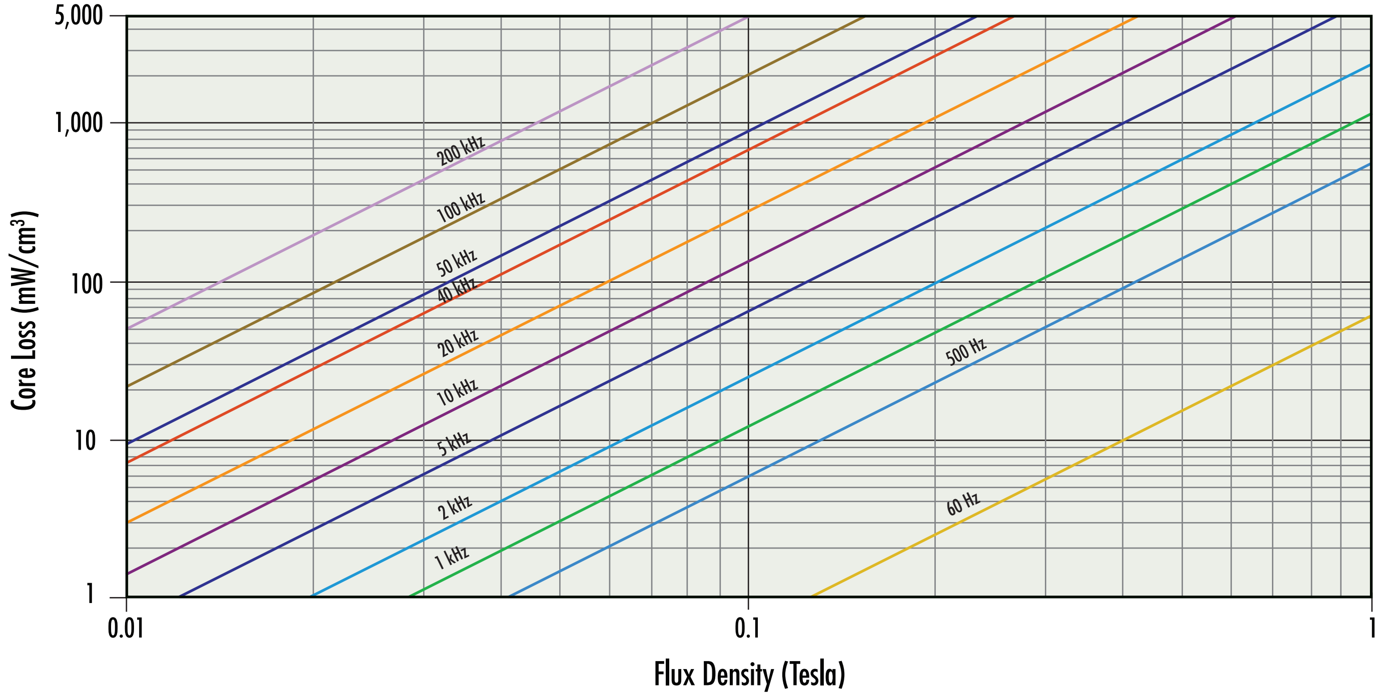


Kool Mμ® 125μ

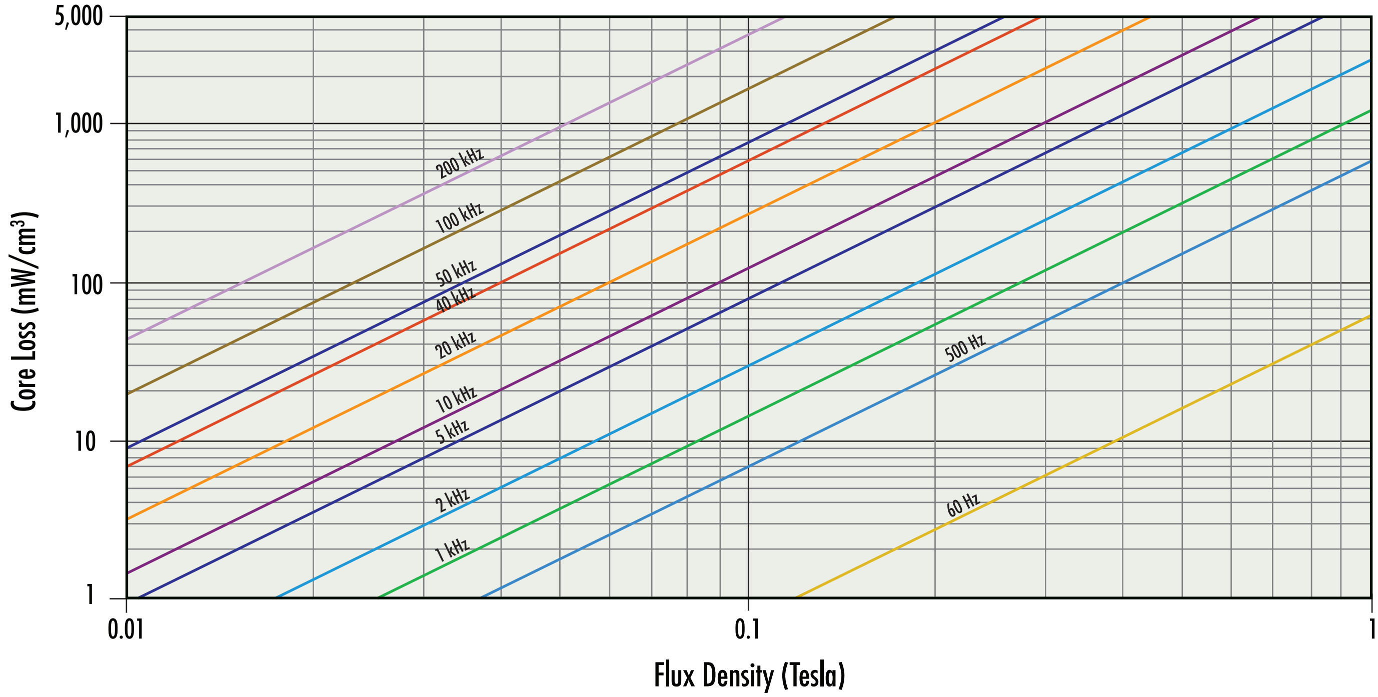


Core Loss Density Curves

XFLUX® 26µ

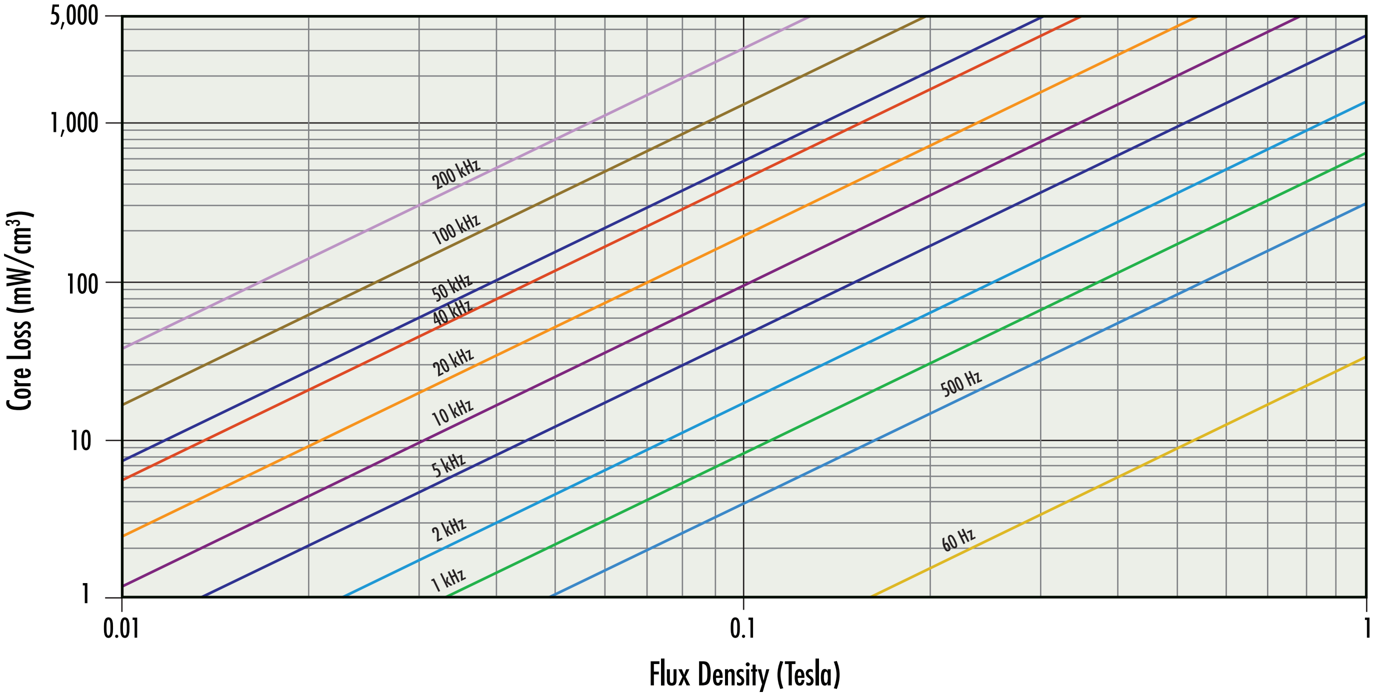


XFLUX® 40µ

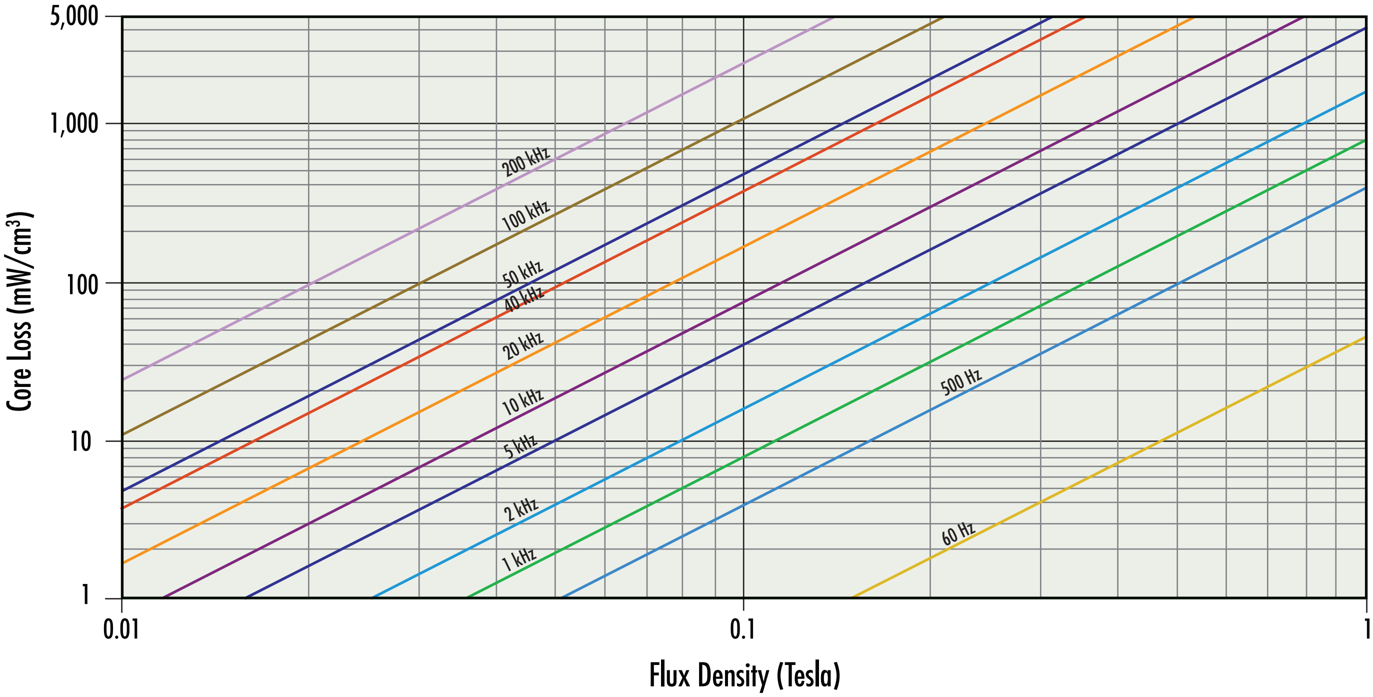


Core Loss Density Curves

XFLUX® 60μ

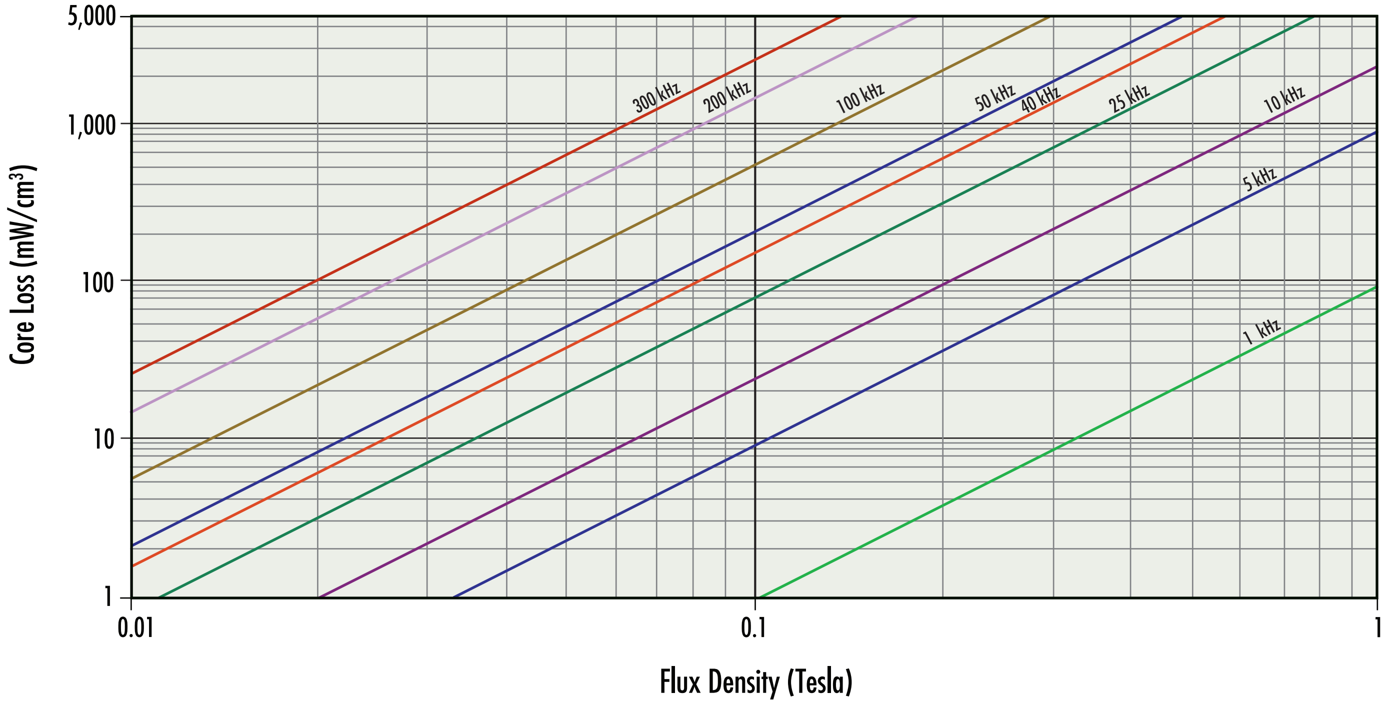


XFLUX® 75μ, 90μ



Core Loss Density Curves

Kool Mµ® MAX 26µ, 60µ



Core Loss Density Curves

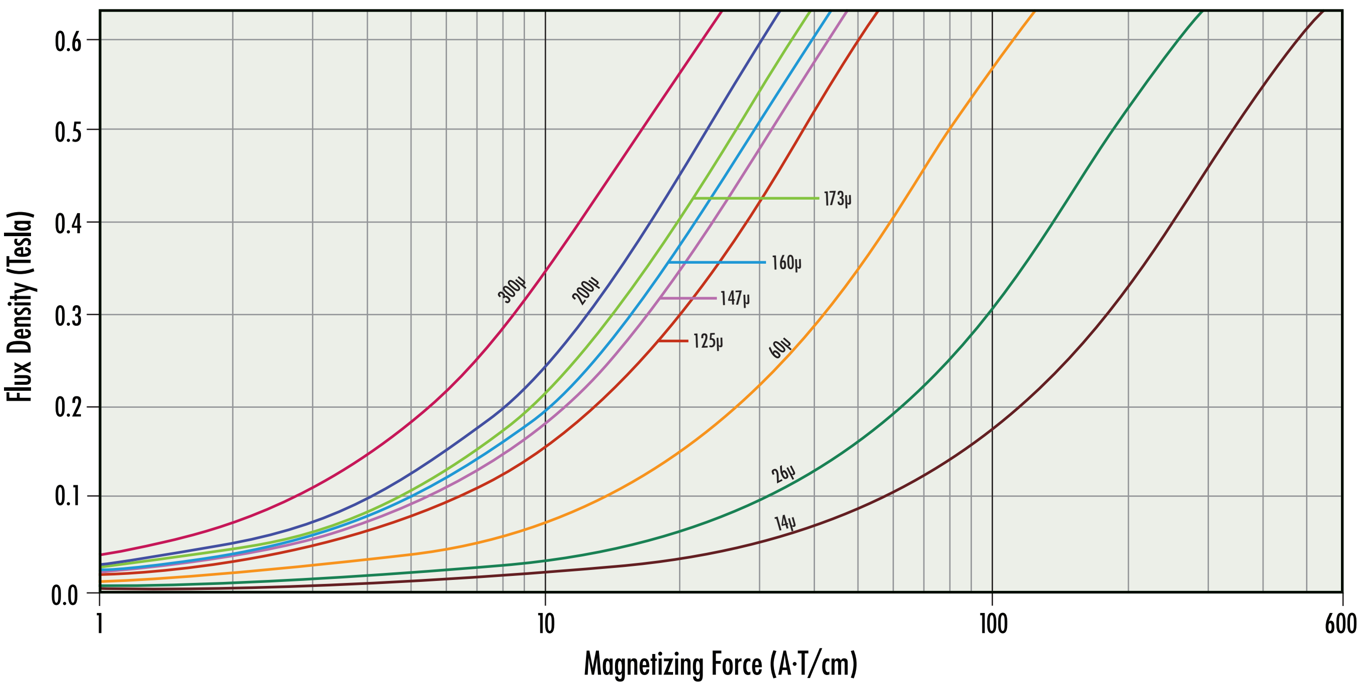
Fit Formula

$P = a(B^b)(f^c)$ (B in Tesla, f in kHz)

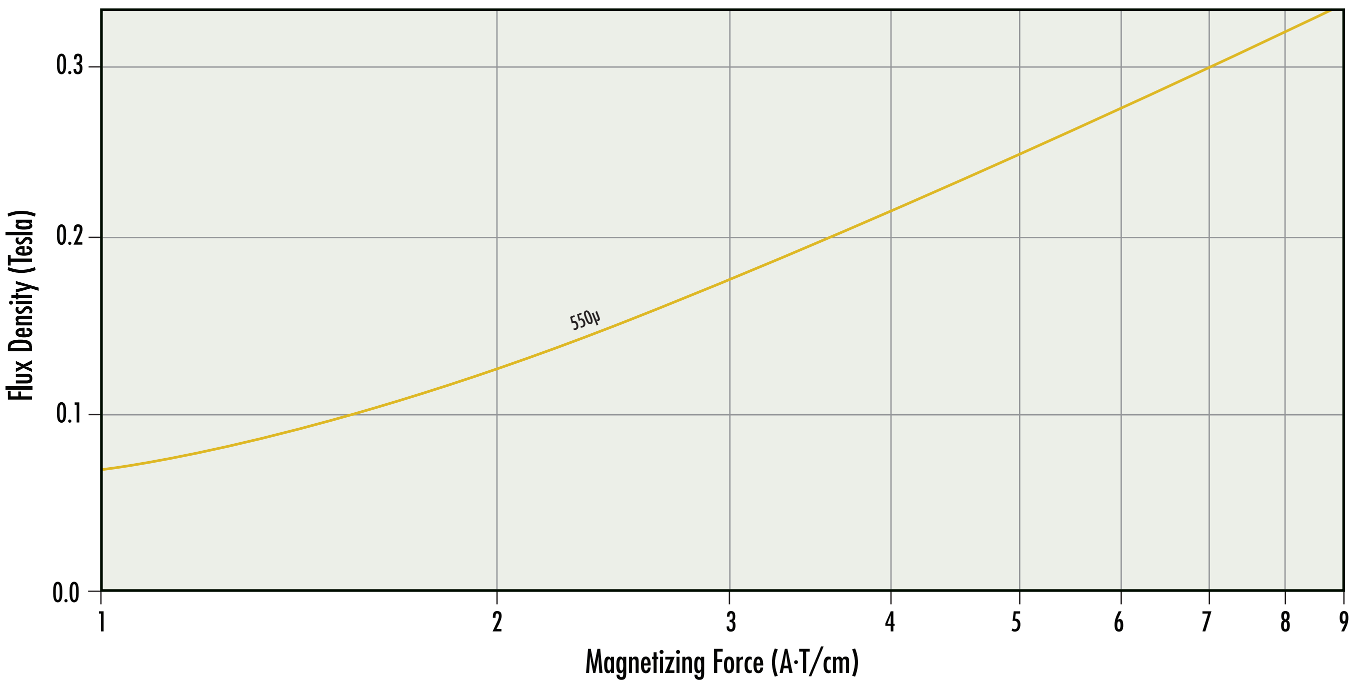
	Perm	freq:	a	b	c
MPP	14µ	> 10kHz	21.06	1.074	1.38
	14µ	< 10kHz	64.02	1.074	1.11
	26µ	> 10kHz	109.17	2.000	1.37
	26µ	< 10kHz	361.62	2.000	1.08
	60µ	> 10kHz	31.32	1.585	1.37
	60µ	< 10kHz	80.12	1.585	1.04
	125µ-173µ	> 10kHz	87.07	2.222	1.56
	125µ-173µ	< 10kHz	254.26	2.222	1.17
	200µ, 300µ	> 10kHz	115.52	2.322	1.59
	200µ, 300µ	< 10kHz	320.32	2.322	1.19
	500µ	> 10kHz	96.89	1.999	1.54
	500µ	< 10kHz	303.43	1.999	1.09
High Flux	14µ	all	181.14	1.386	1.21
	26µ	> 25kHz	532.55	2.170	1.35
	26µ	< 25kHz	1550.54	2.170	1.05
	40µ	> 25kHz	1707.09	2.280	1.14
	40µ	< 25kHz	2021.58	2.280	1.05
	60µ, 125µ	> 25kHz	47.51	1.585	1.43
	60µ, 125µ	< 25kHz	151.44	1.585	1.09
	147µ-160µ	> 25kHz	203.61	2.163	1.52
	147µ-160µ	< 25kHz	883.51	2.163	1.09
Kool Mµ®	14µ	> 10kHz	21.49	1.000	1.33
	14µ	< 10kHz	40.18	1.000	1.22
	26µ, 40µ	> 10kHz	45.48	1.774	1.46
	26µ, 40µ	< 10kHz	170.17	1.774	1.03
	60µ	> 9kHz	62.65	1.781	1.36
	60µ	< 9kHz	136.93	1.781	1.12
	75µ, 90µ	> 10kHz	146.81	2.022	1.33
	75µ, 90µ	< 10kHz	338.51	2.022	1.05
	125µ	> 10kHz	71.93	1.928	1.47
	125µ	< 10kHz	228.46	1.928	1.05
XFlux®	26µ	> 25kHz	761.36	1.977	1.21
	26µ	< 25kHz	1187.96	1.977	1.05
	40µ	> 9kHz	804.88	1.934	1.14
	40µ	< 9kHz	1274.93	1.934	1.06
	60µ	> 10kHz	454.56	1.909	1.19
	60µ	< 10kHz	670.26	1.909	1.06
	75µ, 90µ	> 9kHz	566.54	2.018	1.17
	75µ, 90µ	< 9kHz	862.34	2.018	1.02
Kool Mµ® MAX	26µ, 60µ	>10kHz	86.00	1.998	1.40
	26µ, 60µ	<10kHz	94.67	1.998	1.40

DC Magnetization Curves

MPP 14µ-300µ

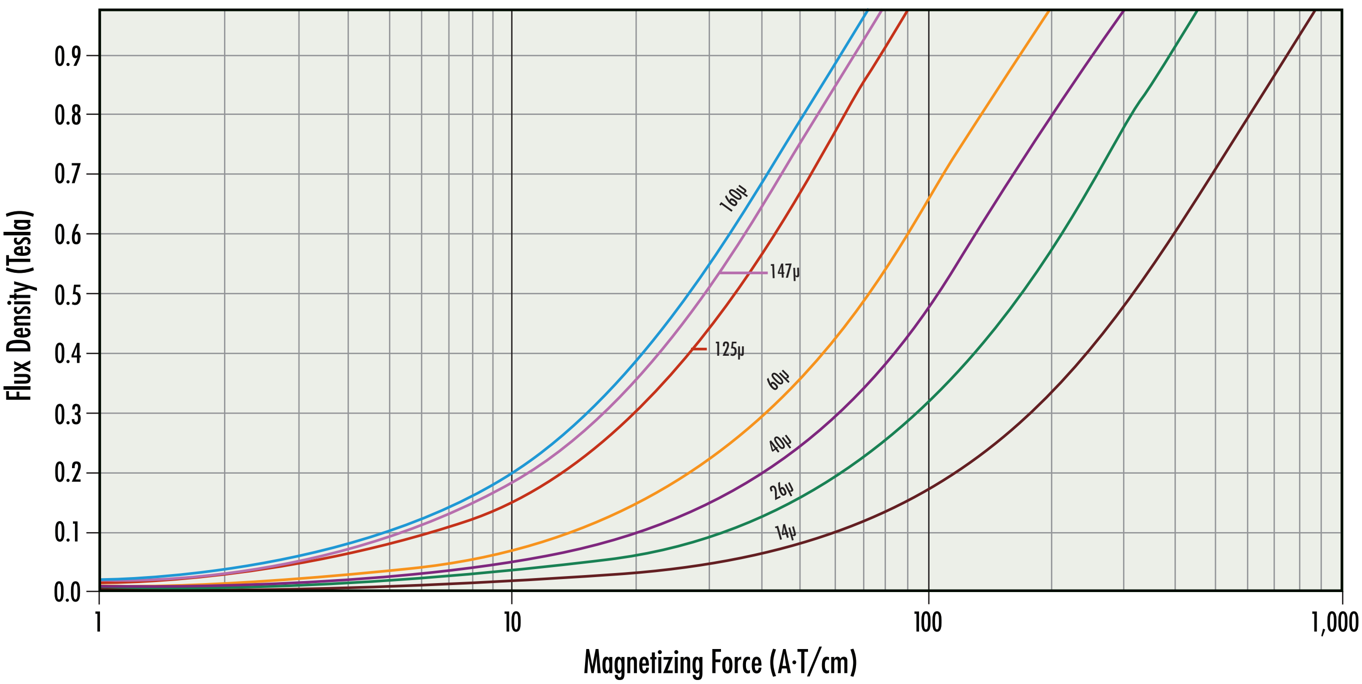


MPP 550µ

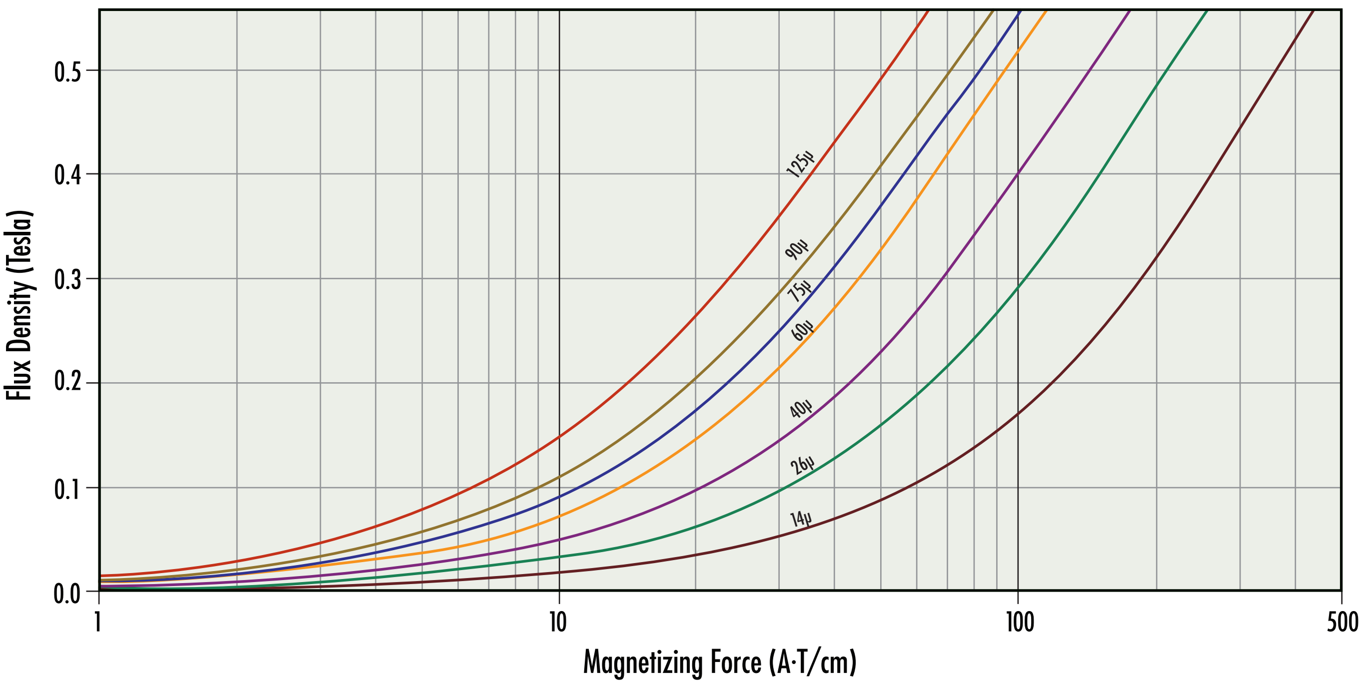


DC Magnetization Curves

High Flux

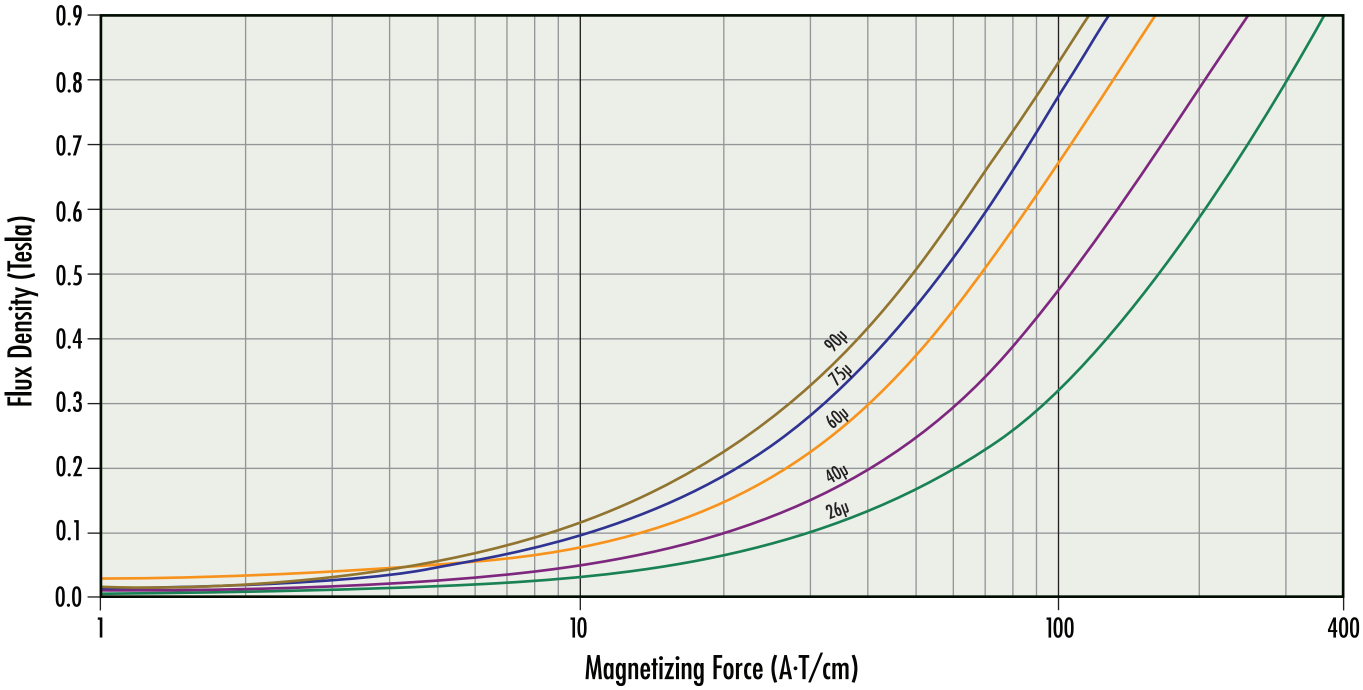


Kool Mμ®

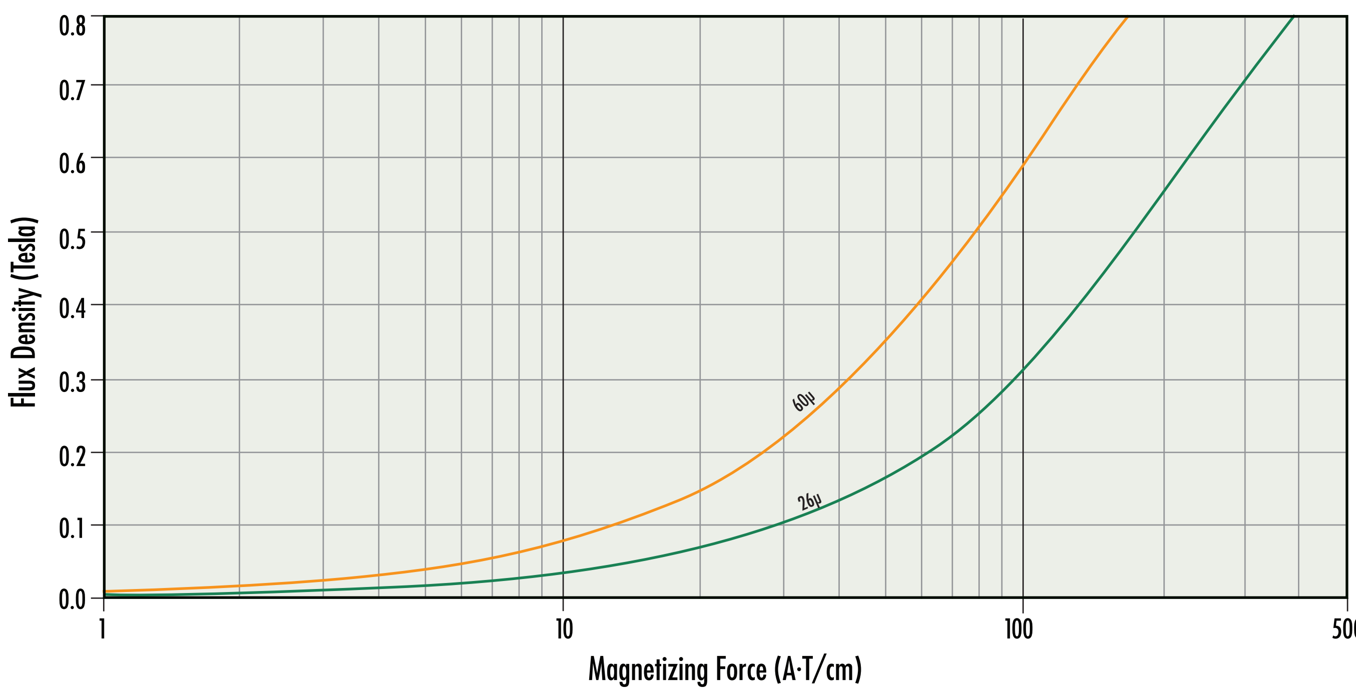


DC Magnetization Curves

XFLUX®



Kool Mµ® MAX



DC Magnetization Curves

Fit Formula

$$B = \left[\frac{a + bH + cH^2}{1 + dH + eH^2}\right]^x$$ Units: B in Tesla; H in A · Turns/cm

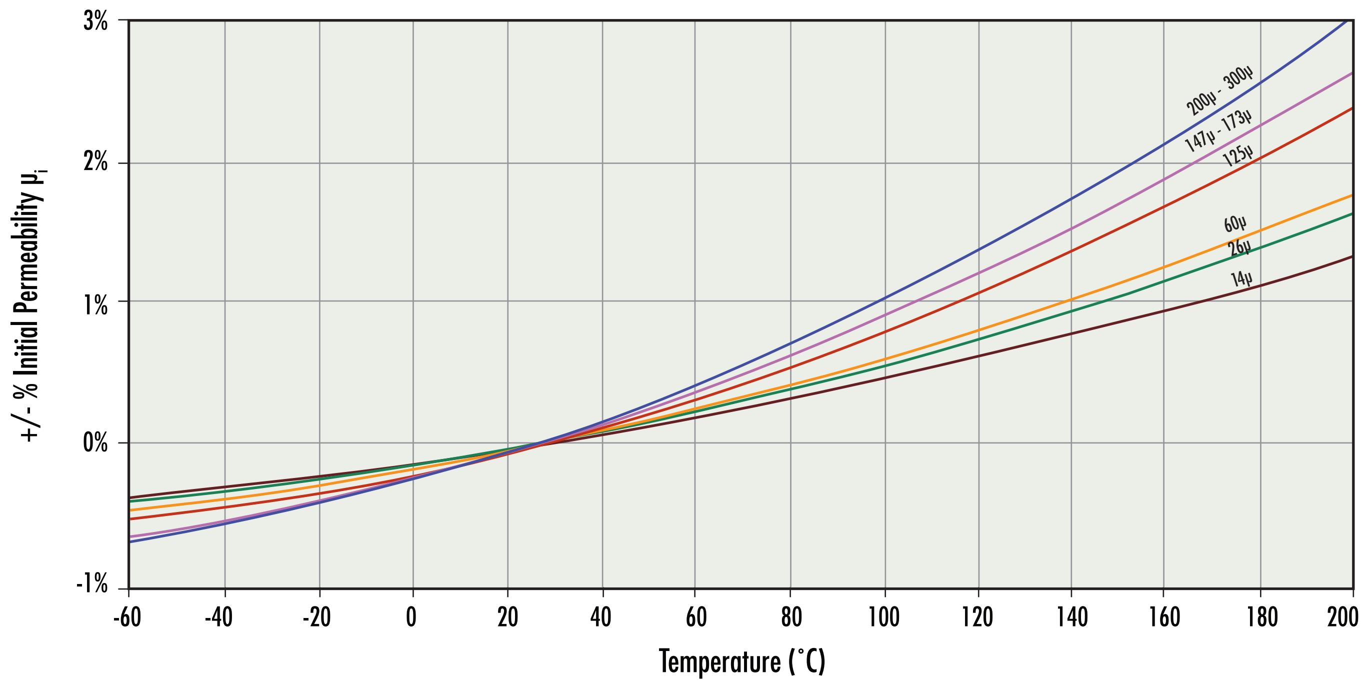
where:

	Perm	a	b	c	d	e	x
MPP	14µ	1.106E-01	1.275E-02	6.686E-04	1.308E-01	6.381E-04	1.876
	26µ	1.112E-01	1.369E-02	7.979E-04	8.732E-02	7.647E-04	1.907
	60µ	7.871E-02	1.893E-02	9.356E-04	5.847E-02	8.919E-04	1.724
	125µ	2.429E-02	2.184E-02	1.287E-03	5.362E-02	1.144E-03	1.258
	147µ	1.707E-02	2.077E-02	1.310E-03	4.408E-02	1.246E-03	1.152
	160µ	1.458E-02	2.140E-02	1.436E-03	4.367E-02	1.389E-03	1.124
	173µ	1.221E-02	2.147E-02	1.468E-03	3.965E-02	1.435E-03	1.089
	200µ	7.098E-03	2.201E-02	1.516E-03	3.398E-02	1.517E-03	1.022
	300µ	0.000E+00	2.808E-02	1.373E-03	1.612E-02	1.905E-03	0.906
	550µ	0.000E+00	7.907E-02	0.000E+00	1.016E-01	2.109E-03	1.013
Kool Mµ®	14µ	1.105E-01	1.301E-02	6.115E-04	1.386E-01	5.735E-04	1.760
	26µ	1.008E-01	1.452E-02	7.846E-04	1.035E-01	7.573E-04	1.754
	40µ	5.180E-02	2.132E-02	7.941E-04	8.447E-02	7.652E-04	1.756
	60µ	5.214E-02	2.299E-02	8.537E-04	7.029E-02	8.183E-04	1.658
	75µ	4.489E-02	2.593E-02	7.949E-04	6.463E-02	7.925E-04	1.595
	90µ	4.182E-02	2.990E-02	7.826E-04	6.542E-02	7.669E-04	1.569
	125µ	1.414E-02	2.851E-02	1.135E-03	7.550E-02	1.088E-03	1.274
High Flux	14µ	1.060E-01	1.305E-02	5.119E-04	1.497E-01	3.616E-04	1.617
	26µ	1.098E-01	1.421E-02	7.332E-04	1.123E-01	5.217E-04	1.695
	40µ	9.617E-02	1.690E-02	8.908E-04	8.503E-02	6.628E-04	1.784
	60µ	8.049E-02	1.887E-02	9.733E-04	7.198E-02	6.927E-04	1.660
	125µ	4.235E-02	2.235E-02	1.330E-03	5.798E-02	8.447E-04	1.324
	147µ	3.315E-02	2.308E-02	1.454E-03	5.459E-02	9.259E-04	1.242
	160µ	2.616E-02	2.332E-02	1.537E-03	5.408E-02	9.642E-04	1.186
XFlux®	26µ	1.093E-01	1.478E-02	6.629E-04	1.085E-01	4.429E-04	1.683
	40µ	8.539E-02	1.772E-02	8.617E-04	8.744E-02	6.280E-04	1.753
	60µ	1.220E-01	1.471E-02	0.000E+00	9.272E-03	5.418E-06	1.837
	75µ	1.081E-01	1.882E-02	1.834E-04	1.999E-02	1.408E-04	1.778
	90µ	5.668E-02	2.116E-02	1.088E-03	5.968E-02	7.969E-04	1.497
Kool Mµ® MAX	26µ	8.741E-02	1.634E-02	7.844E-04	1.044E-01	6.576E-04	1.814
	60µ	6.944E-02	2.004E-02	8.924E-04	6.666E-02	7.314E-04	1.666

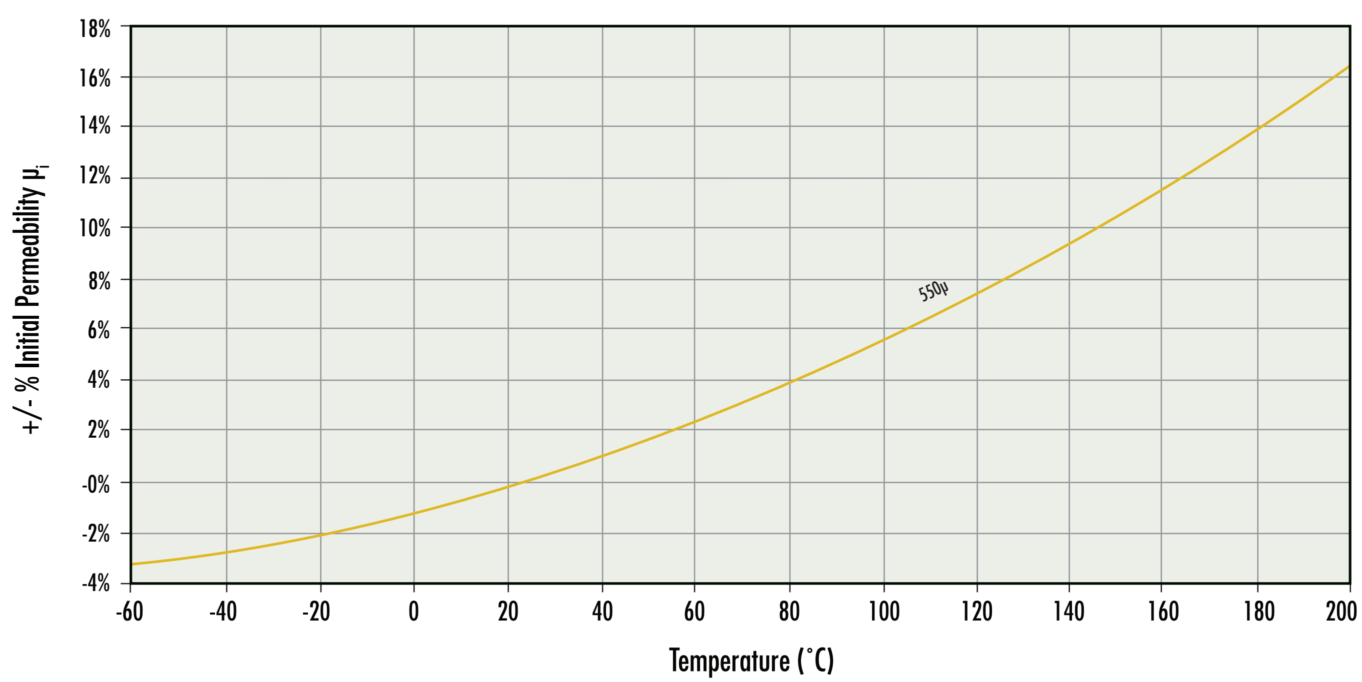
Note: all numbers calculated using A•T/cm

Permeability versus Temperature Curves

MPP 14μ-300μ

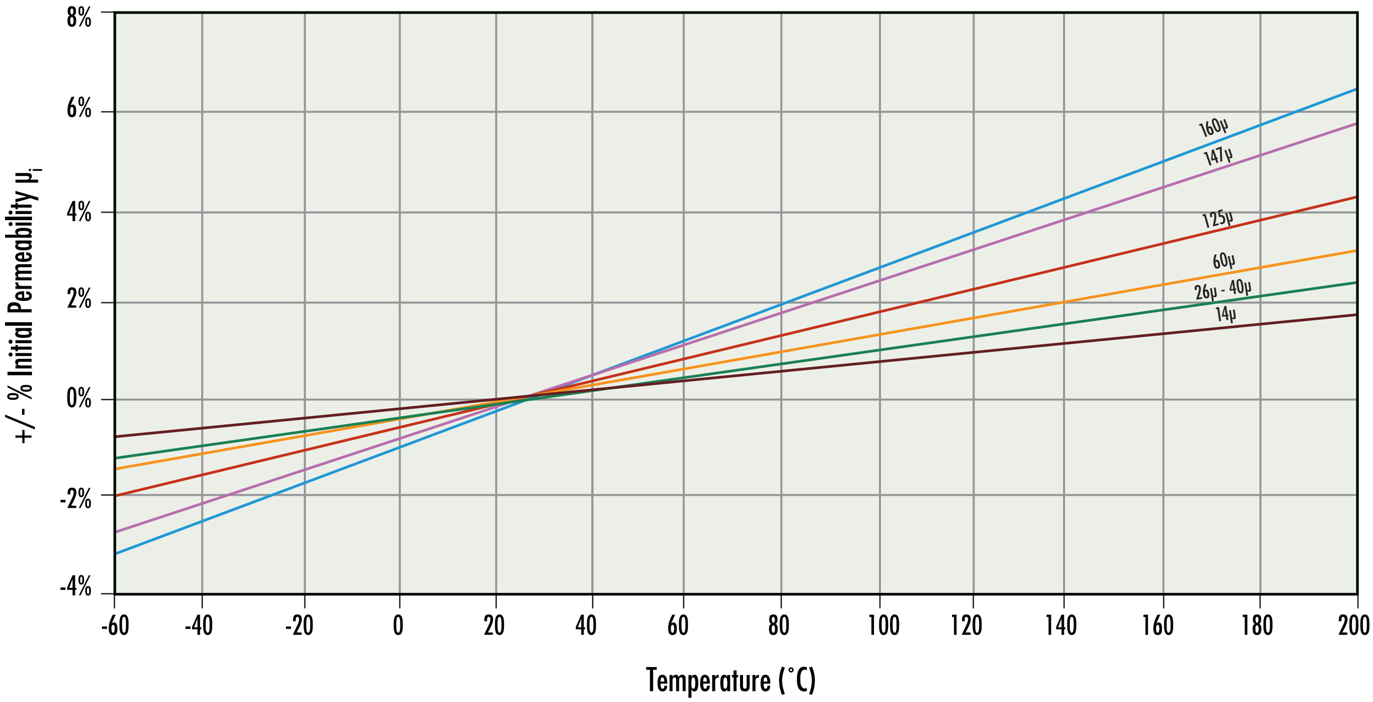


MPP 550μ

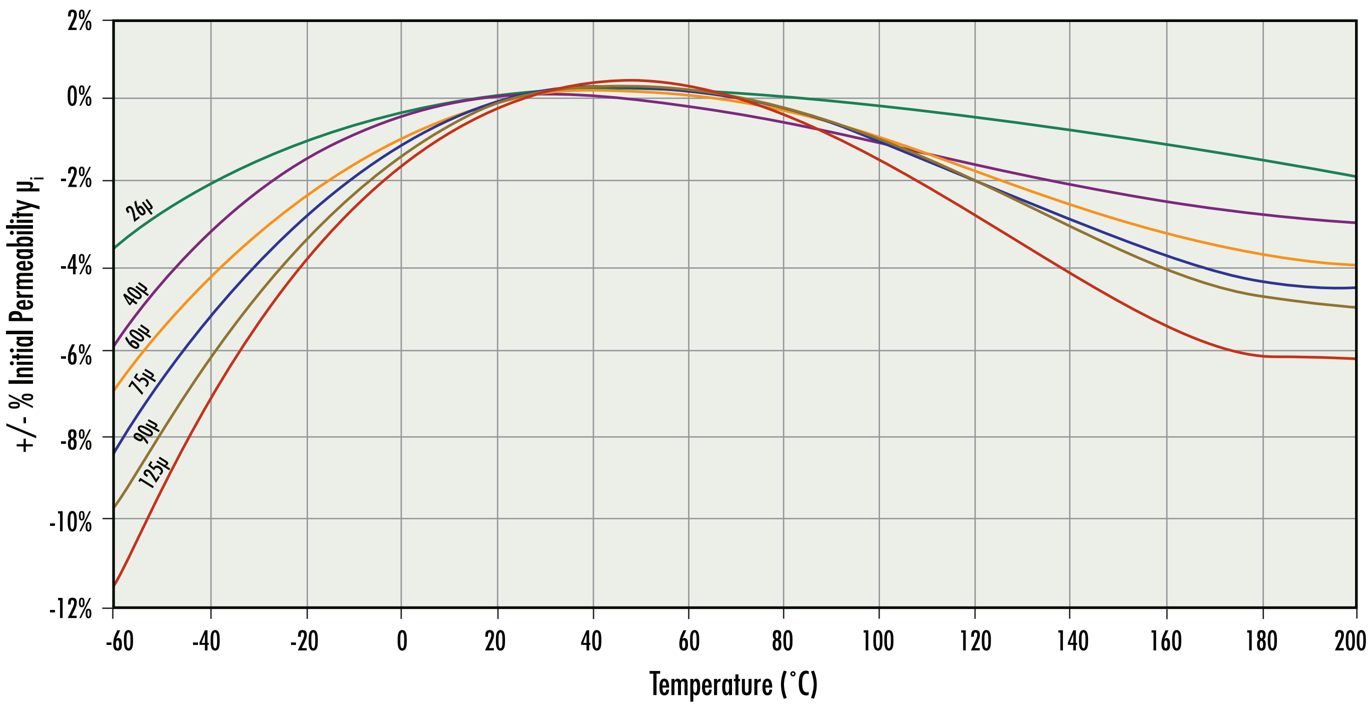


Permeability versus Temperature Curves

High Flux

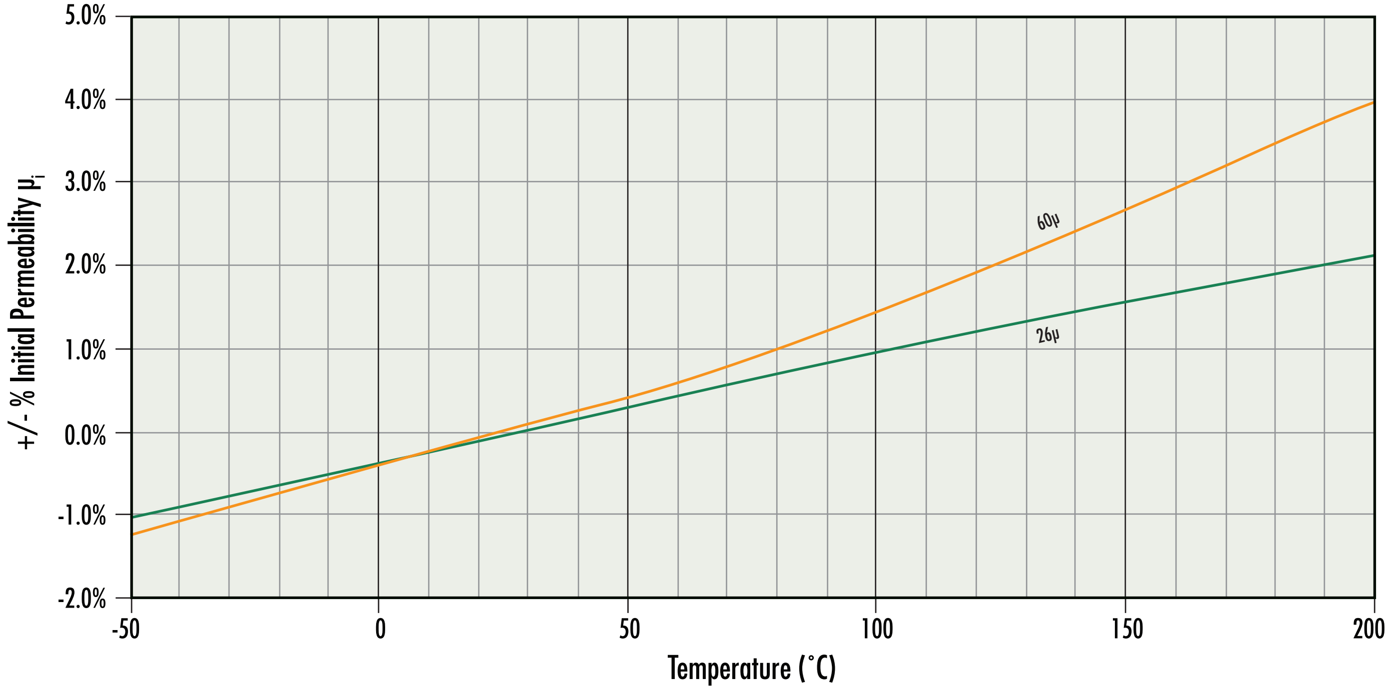


Kool Mμ®



Permeability versus Temperature Curves

XFLUX®



Permeability versus Temperature Curves

Fit Formula

Change compared with $\mu_{25^\circ C} = \dfrac{\mu_T - \mu_{25^\circ C}}{\mu_{25^\circ C}} = a + bT + cT^2$

where:

	Perm	a	b	c
MPP	14µ	-1.300E-03	4.750E-05	1.300E-07
	26µ	-1.431E-03	5.265E-05	1.837E-07
	60µ	-1.604E-03	5.945E-05	1.875E-07
	125µ	-1.939E-03	7.013E-05	2.967E-07
	147µ	-2.308E-03	8.497E-05	2.943E-07
	160µ	-2.308E-03	8.497E-05	2.943E-07
	173µ	-2.308E-03	8.497E-05	2.943E-07
	200µ	-2.528E-03	9.211E-05	3.601E-07
	300µ	-2.528E-03	9.211E-05	3.601E-07
	550µ	-1.309E-02	4.716E-04	2.086E-06
High Flux	14µ	-2.500E-03	9.670E-05	5.560E-08
	26µ	-3.300E-03	1.290E-04	3.800E-08
	60µ	-4.400E-03	1.740E-04	4.090E-08
	125µ	-6.000E-03	2.400E-04	3.220E-08
	147µ	-7.900E-03	3.140E-04	7.310E-08
	160µ	-9.200E-03	3.670E-04	1.750E-08

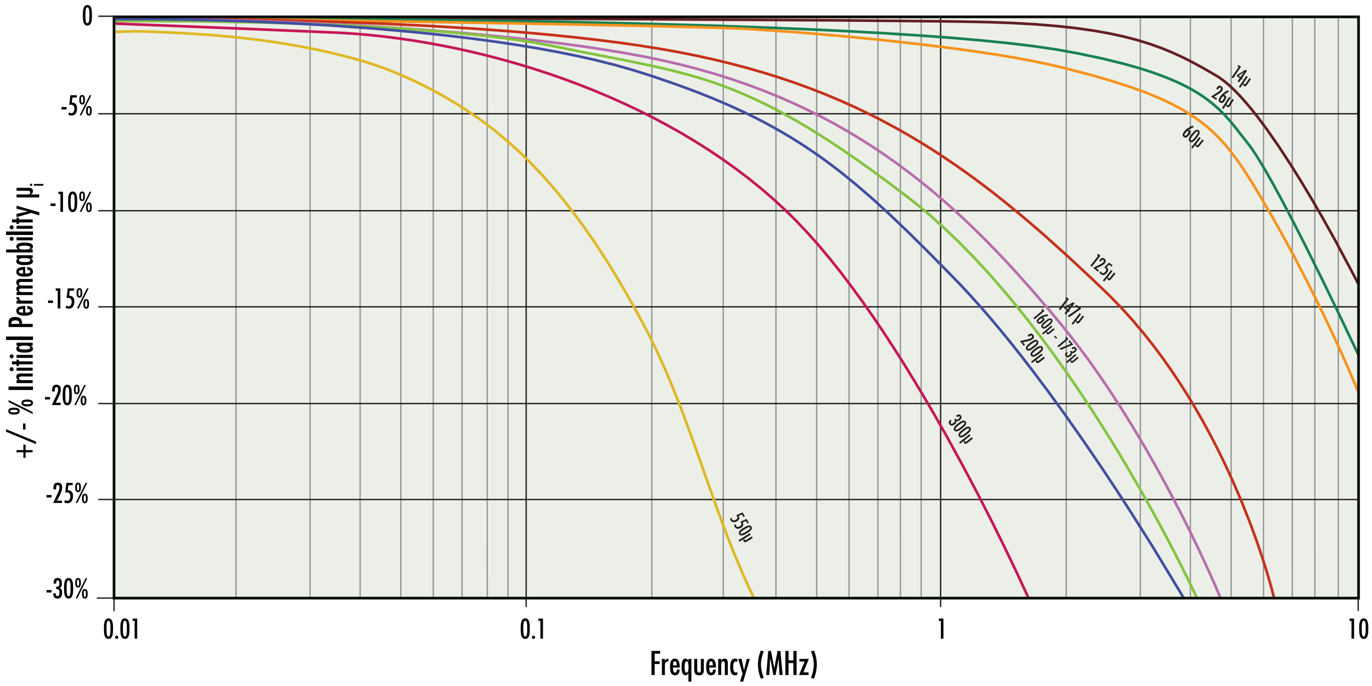
Change compared with $\mu_{25^\circ C} = \dfrac{\mu_T - \mu_{25^\circ C}}{\mu_{25^\circ C}} = a + bT + cT^2 + dT^3 + eT^4$

where:

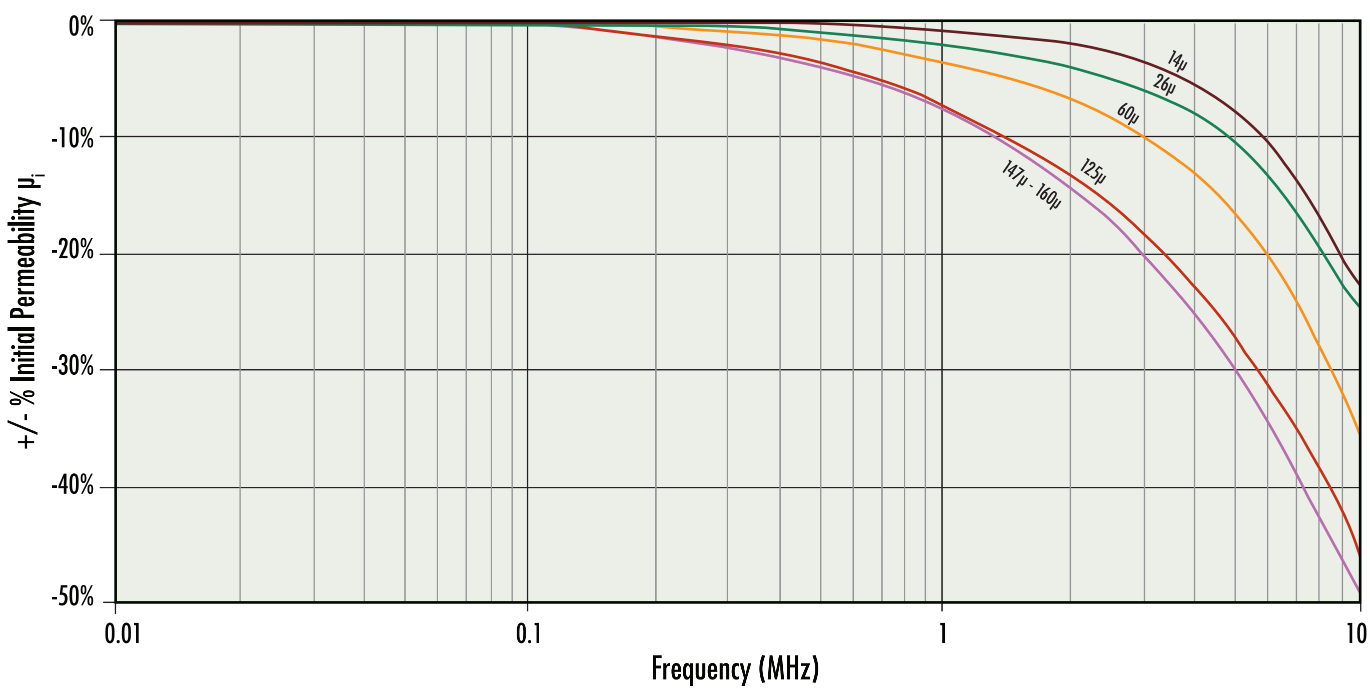
	Perm	a	b	c	d	e
Kool Mµ®	26µ	-4.289E-03	2.521E-04	-3.557E-06	1.384E-08	-2.066E-11
	40µ	-5.034E-03	3.521E-04	-6.797E-06	3.193E-08	-4.916E-11
	60µ	-8.841E-03	5.197E-04	-7.064E-06	1.667E-08	8.820E-12
	75µ	-1.174E-02	6.653E-04	-8.195E-06	1.411E-08	3.032E-11
	90µ	-1.369E-02	7.705E-04	-9.385E-06	1.812E-08	2.524E-11
	125µ	-1.647E-02	9.306E-04	-1.132E-05	1.623E-08	5.722E-11
XFlux®	26µ	-3.879E-03	1.356E-04	1.228E-07	-1.739E-09	4.35E-12
	60µ	-4.010E-03	1.553E-04	-1.875E-08	3.907E-09	-1.213E-11

Permeability versus Frequency Curves

MPP

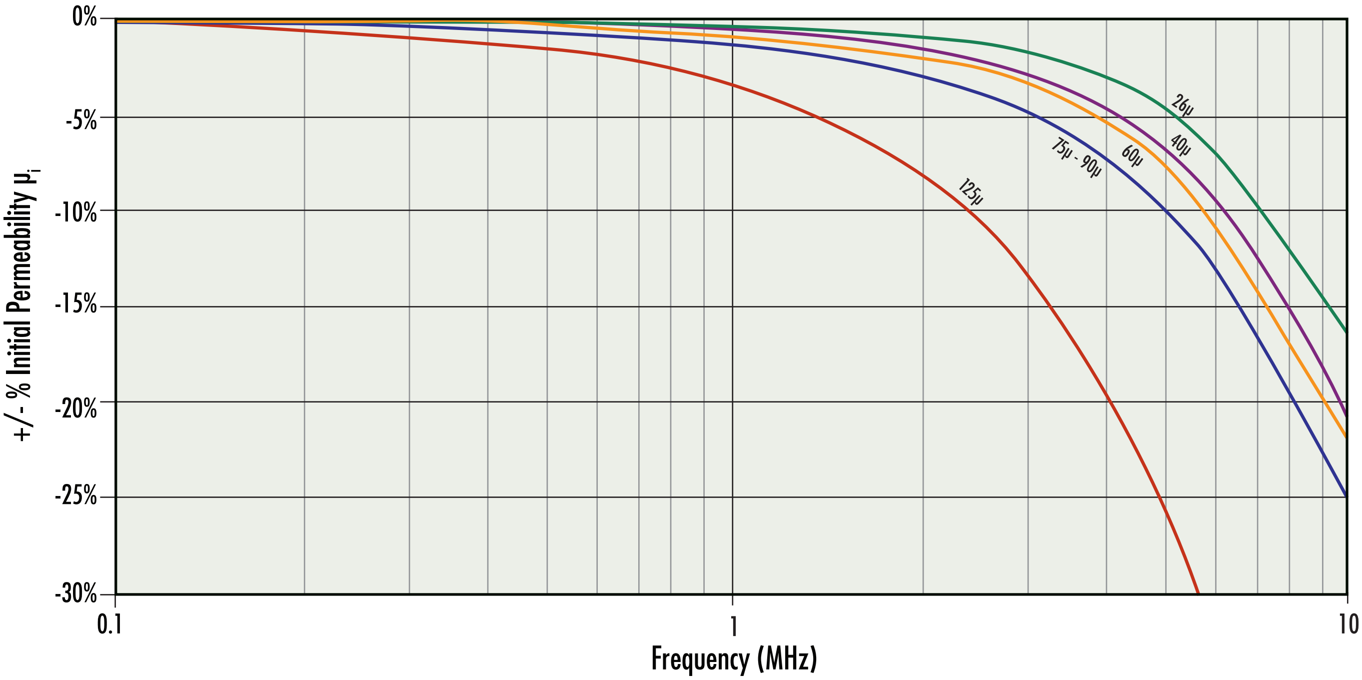


High Flux

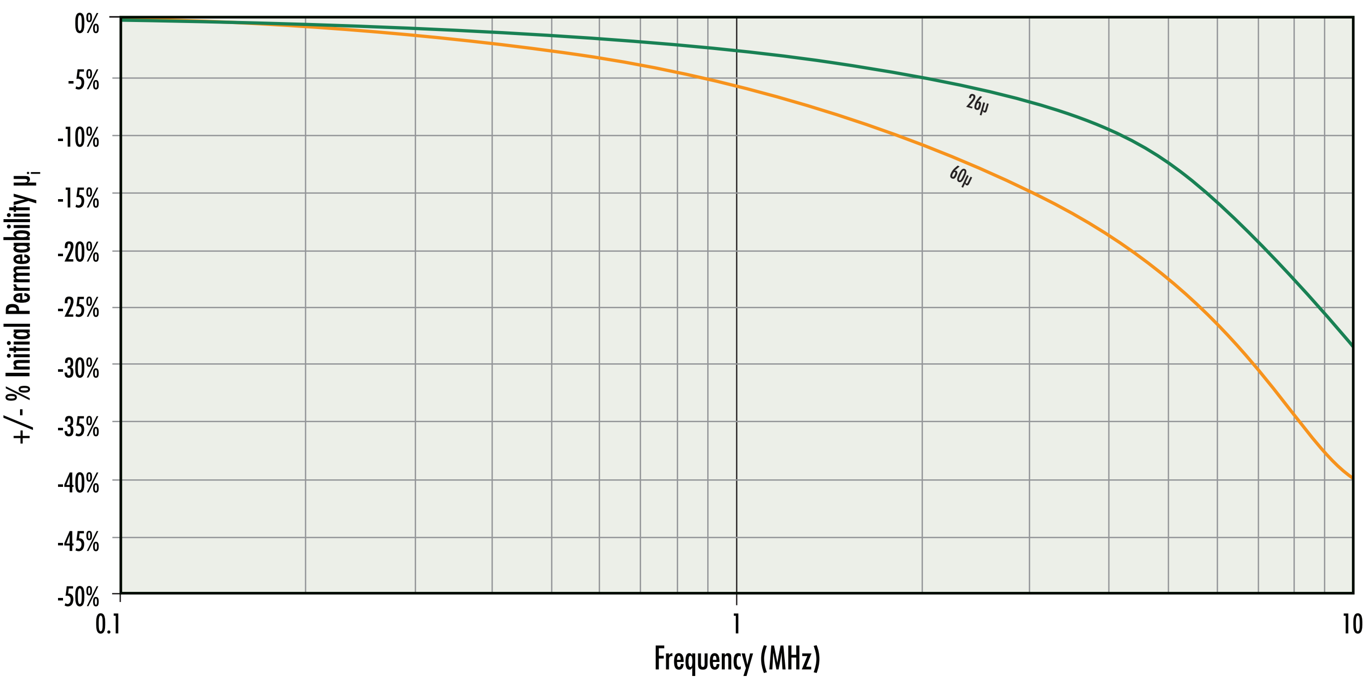


Permeability versus Frequency Curves

Kool Mμ®



XFlux®



Permeability versus Frequency Curves

Fit Formula

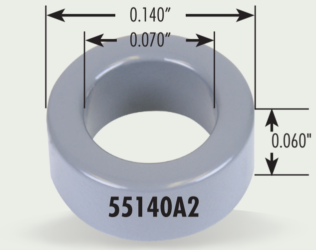
$\pm \mu_i = a + bf + cf^2 + df^3 + ef^4$ Units: f in MHz

where:

	Perm	a	b	c	d	e
MPP	14µ	0	-2.320E-03	7.630E-04	-5.070E-04	3.170E-05
	26µ	0	-1.560E-02	5.190E-03	-1.160E-03	6.230E-05
	60µ	0	-1.820E-02	4.320E-03	-9.780E-04	5.360E-05
	125µ	0	-8.430E-02	1.590E-02	-2.270E-03	1.080E-04
	147µ	0	-1.110E-01	2.040E-02	-2.810E-03	1.300E-04
	160µ	0	-1.290E-01	2.390E-02	-3.080E-03	1.410E-04
	173µ	0	-1.290E-01	2.390E-02	-3.080E-03	1.410E-04
	200µ	0	-1.610E-01	3.820E-02	-5.170E-03	2.160E-04
	300µ	0	-2.590E-01	5.570E-02	-6.530E-03	2.780E-04
	550µ	0	-4.590E-01	-3.3E+00	8.14E+00	-5.73E+00
High Flux	14µ	0	-1.070E-02	5.960E-04	-4.920E-04	3.070E-05
	26µ	0	-2.560E-02	3.430E-03	-7.340E-04	3.990E-05
	60µ	0	-3.870E-02	3.050E-03	-5.490E-04	2.690E-05
	125µ	0	-8.600E-02	1.140E-02	-1.370E-03	6.050E-05
	147µ	0	-8.170E-02	7.330E-03	-6.400E-04	2.390E-05
	160µ	0	-8.590E-02	7.220E-03	-5.530E-04	1.880E-05
Kool Mµ®	26µ	0	-5.500E-03	1.400E-03	-6.200E-04	3.700E-05
	40µ	0	-7.300E-03	8.400E-04	-5.900E-04	3.700E-05
	60µ	0	-1.100E-02	1.600E-03	-7.100E-04	4.400E-05
	75µ	0	-2.000E-02	3.500E-03	-9.500E-04	5.500E-05
	90µ	0	-1.500E-02	6.900E-04	-4.800E-04	3.100E-05
	125µ	0	-3.000E-02	-5.500E-03	2.400E-04	4.500E-06
XFLUX®	26µ	3.000E-04	-3.132E-02	4.902E-03	-1.015E-03	5.543E-05
	60µ	6.805E-03	-7.575E-02	1.206E-02	-1.607E-03	7.524E-05

3.56 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	3.56 mm/0.140 in	1.78 mm/0.070 in	1.52 mm/0.060 in
After Finish (limits)	4.20 mm/0.165 in	1.27 mm/0.050 in	2.16 mm/0.085 in



Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 15%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
60	13	-	-	77141	-	-
75	16	-	-	77445	-	-
90	19	-	-	77444	-	-
125	26	55140	-	77140	-	-
147	31	55139	-	-	-	-
160	33	55138	-	-	-	-
173	36	55134	-	-	-	-
200	42	55137	-	-	-	-
300	62	55135	-	-	-	-

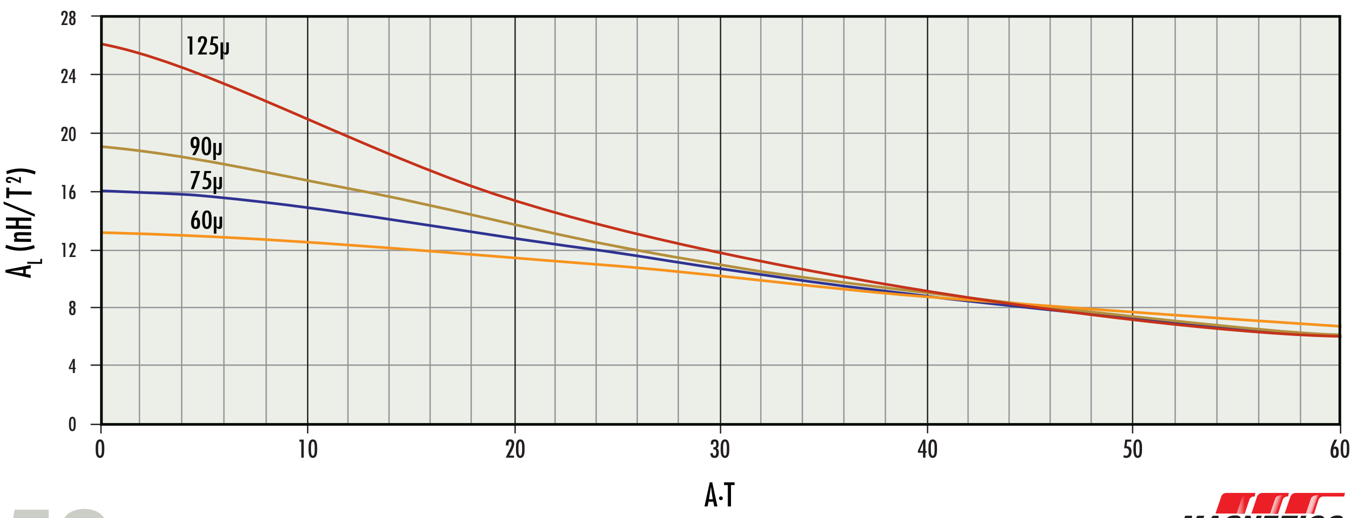
Physical Characteristics	
Window Area	1.27 mm^2
Cross Section	1.30 mm^2
Path Length	8.06 mm
Volume	10.5 mm^3
Weight - MPP	0.094 g
Weight - High Flux	-
Weight - Kool Mµ	0.065 g
Weight - XFLUX	-
Weight - Kool Mµ MAX	-
Area Product	1.65 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	7.24
20%	7.56
25%	7.65
30%	7.70
35%	7.81
40%	7.89
45%	7.98
50%	8.08
60%	8.27
70%	8.48

Wound Coil Dimensions		
40% Winding Factor	OD	4.30 mm
	HT	2.56 mm
Completely Full Window	Max OD	4.95 mm
	Max HT	2.74 mm

Surface Area	
Unwound Core	60 mm^2
40% Winding Factor	70 mm^2

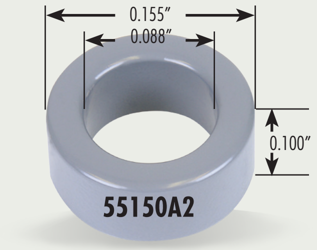
Kool Mµ A_L vs. DC Bias



MAGNETICS®

3.94 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	3.94 mm/0.155 in	2.24 mm/0.088 in	2.54 mm/0.100 in
After Finish (limits)	4.58 mm/0.180 in	1.72 mm/0.068 in	3.18 mm/0.125 in



Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 15%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
60	17	-	-	77151	-	-
75	21	-	-	77155	-	-
90	25	-	-	77154	-	-
125	35	55150	-	77150	-	-
147	41	55149	-	-	-	-
160	45	55148	-	-	-	-
173	48	55144	-	-	-	-
200	56	55147	-	-	-	-
300	84	55145	-	-	-	-

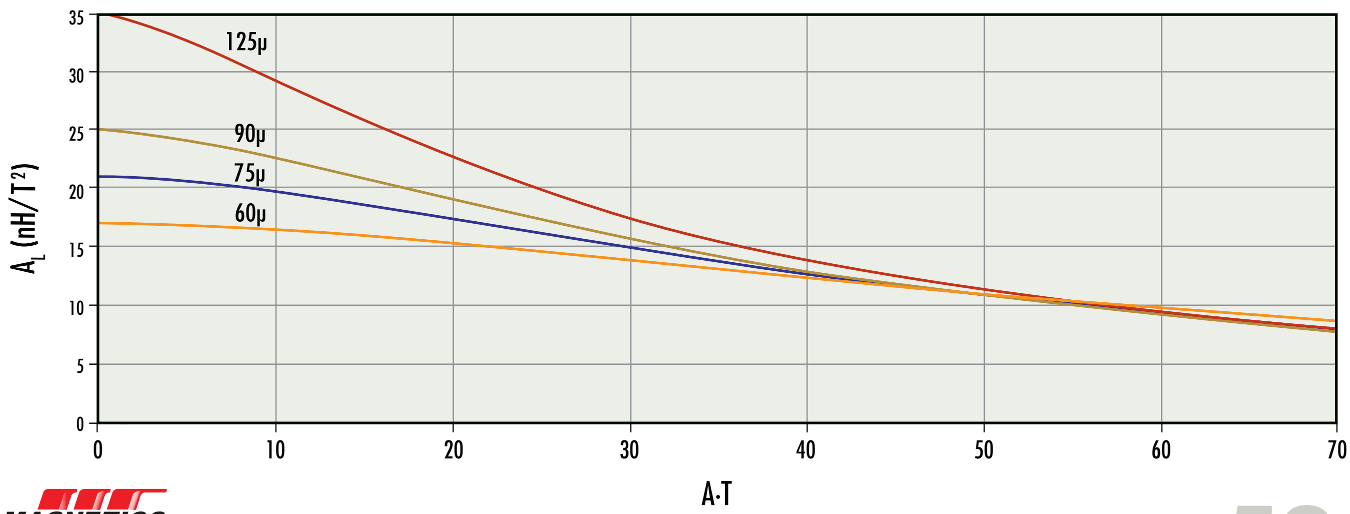
Physical Characteristics	
Window Area	2.32 mm²
Cross Section	2.11 mm²
Path Length	9.42 mm
Volume	19.9 mm³
Weight - MPP	0.17 g
Weight - High Flux	-
Weight - Kool Mµ	0.12 g
Weight - XFLUX	-
Weight - Kool Mµ MAX	-
Area Product	4.90 mm⁴

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	9.20
20%	9.64
25%	9.76
30%	9.84
35%	9.98
40%	10.1
45%	10.2
50%	10.3
60%	10.6
70%	10.9

Wound Coil Dimensions		
40% Winding Factor	OD	4.85 mm
	HT	3.73 mm
Completely Full Window	Max OD	5.77 mm
	Max HT	4.75 mm

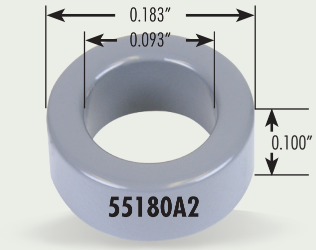
Surface Area	
Unwound Core	90 mm²
40% Winding Factor	110 mm²

Kool Mµ A_L vs. DC Bias



4.65 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	4.65 mm/0.183 in	2.36 mm/0.093 in	2.54 mm/0.100 in
After Finish (limits)	5.29 mm/0.208 in	1.85 mm/0.073 in	3.18 mm/0.125 in



Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 15%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
60	20	55181	-	77181	-	-
75	25	-	-	77185	-	-
90	30	-	-	77184	-	-
125	42	55180	-	77180	-	-
147	49	55179	-	-	-	-
160	53	55178	-	-	-	-
173	57	55174	-	-	-	-
200	67	55177	-	-	-	-
300	99	55175	-	-	-	-

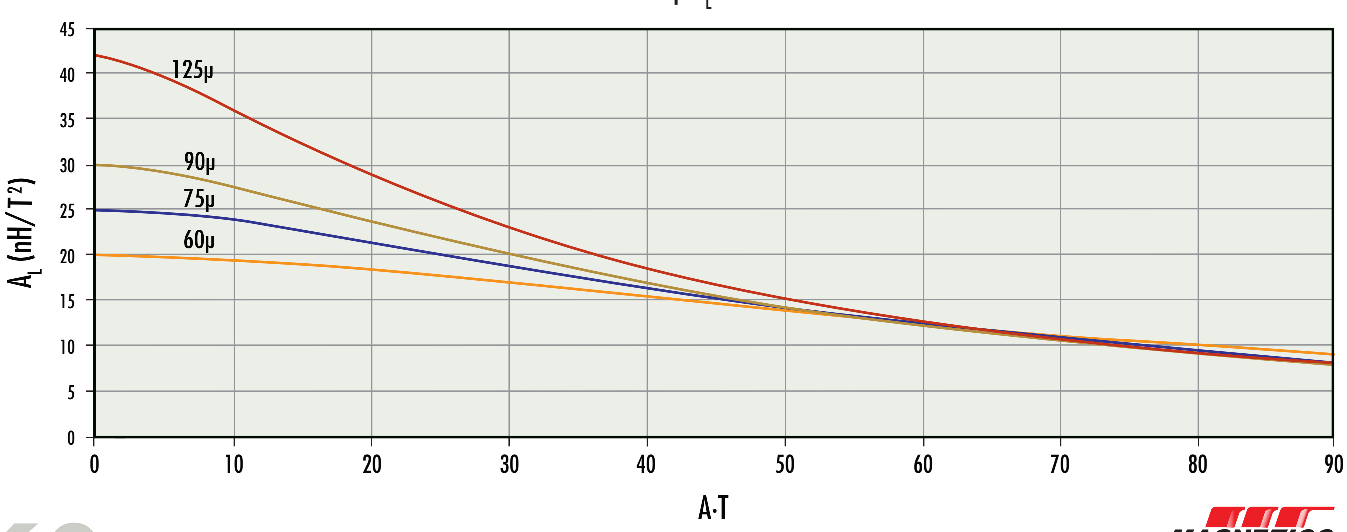
Physical Characteristics	
Window Area	2.69 mm^2
Cross Section	2.85 mm^2
Path Length	10.6 mm
Volume	30.3 mm^3
Weight - MPP	0.25 g
Weight - High Flux	-
Weight - Kool Mμ	0.18 g
Weight - XFlux	-
Weight - Kool Mμ MAX	-
Area Product	7.66 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	9.79
20%	10.3
25%	10.4
30%	10.5
35%	10.6
40%	10.7
45%	10.9
50%	11.0
60%	11.3
70%	11.6

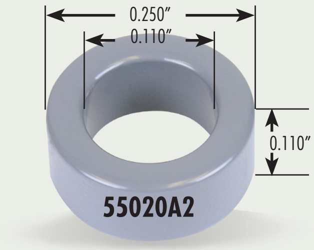
Wound Coil Dimensions		
40% Winding Factor	OD	5.56 mm
	HT	3.73 mm
Completely Full Window	Max OD	6.65 mm
	Max HT	4.94 mm

Surface Area	
Unwound Core	110 mm^2
40% Winding Factor	130 mm^2

Kool Mμ A_L vs. DC Bias



6.35 mm OD



Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	6.35 mm/0.250 in	2.79 mm/0.110 in	2.79 mm/0.110 in
After Finish (limits)	6.99 mm/0.275 in	2.28 mm/0.090 in	3.43 mm/0.135 in

Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mµ®	XFlux®	Kool Mµ® MAX
14	6	55023	58023	-	-	-
26	10	55022	58022	-	-	-
60	24	55021	58021	77021	-	-
75	30	-	-	77825	-	-
90	36	-	-	77824	-	-
125	50	55020	58020	77020	-	-
147	59	55019	58019	-	-	-
160	64	55018	58018	-	-	-
173	69	55014	-	-	-	-
200	80	55017	-	-	-	-
300	120	55015	-	-	-	-
550	220	55016	-	-	-	-

Physical Characteristics	
Window Area	4.08 mm^2
Cross Section	4.70 mm^2
Path Length	13.6 mm
Volume	64.0 mm^3
Weight - MPP	0.59 g
Weight - High Flux	0.55 g
Weight - Kool Mµ	0.39 g
Weight - XFlux	-
Weight - Kool Mµ MAX	-
Area Product	19.2 mm^4

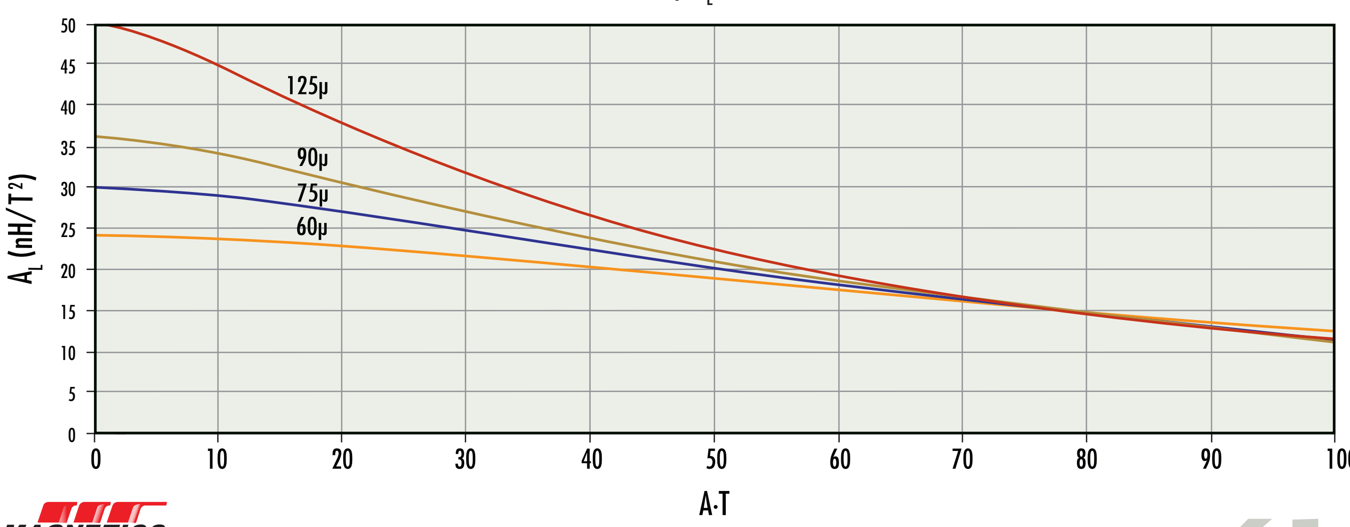
Wound Coil Dimensions		
40% Winding Factor	OD	7.34 mm
	HT	4.12 mm
Completely Full Window	Max OD	8.81 mm
	Max HT	5.38 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	11.6
20%	12.2
25%	12.3
30%	12.4
35%	12.6
40%	12.8
45%	12.9
50%	13.1
60%	13.4
70%	13.9

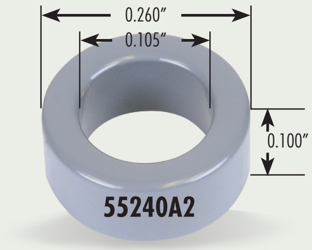
Surface Area	
Unwound Core	170 mm^2
40% Winding Factor	200 mm^2

Kool Mµ A_L vs. DC Bias



6.60 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	6.60 mm/0.260 in	2.67 mm/0.105 in	2.54 mm/0.100 in
After Finish (limits)	7.24 mm/0.285 in	2.15 mm/0.085 in	3.18 mm/0.125 in



Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	6	55243	58243	-	-	-
26	11	55242	58242	-	-	-
60	26	55241	58241	77241	-	-
75	32	-	-	77245	-	-
90	39	-	-	77244	-	-
125	54	55240	58240	77240	-	-
147	64	55239	58239	-	-	-
160	69	55238	58238	-	-	-
173	75	55234	-	-	-	-
200	86	55237	-	-	-	-
300	130	55235	-	-	-	-
550	242	55236	-	-	-	-

Physical Characteristics	
Window Area	3.63 mm^2
Cross Section	4.76 mm^2
Path Length	13.6 mm
Volume	64.9 mm^3
Weight - MPP	0.58 g
Weight - High Flux	0.55 g
Weight - Kool Mμ	0.40 g
Weight - XFlux	-
Weight - Kool Mμ MAX	-
Area Product	17.3 mm^4

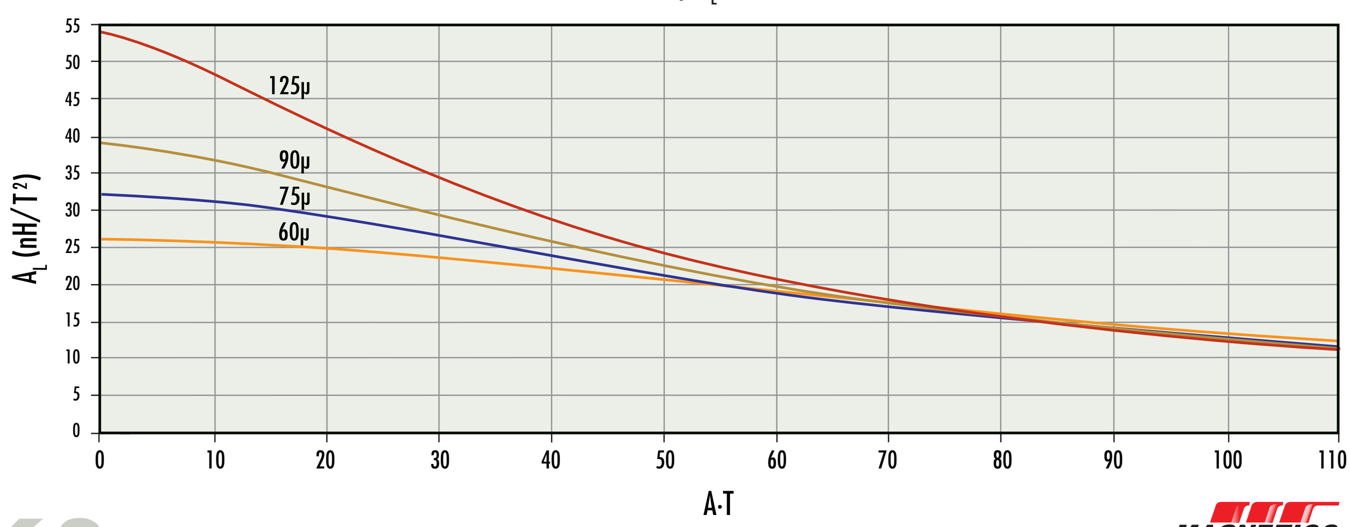
Wound Coil Dimensions		
40% Winding Factor	OD	7.41 mm
	HT	3.87 mm
Completely Full Window	Max OD	9.12 mm
	Max HT	5.13 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

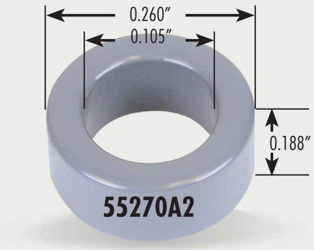
Winding Factor	Length/Turn (mm)
0%	11.4
20%	12.0
25%	12.2
30%	12.3
35%	12.4
40%	12.6
45%	12.7
50%	12.9
60%	13.2
70%	13.6

Surface Area	
Unwound Core	170 mm^2
40% Winding Factor	190 mm^2

Kool Mμ A_L vs. DC Bias



6.60 mm OD



Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	6.60 mm/0.260 in	2.67 mm/0.105 in	4.78 mm/0.188 in
After Finish (limits)	7.24 mm/0.285 in	2.15 mm/0.085 in	5.42 mm/0.213 in

Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	12	55273	58273	-	-	-
26	21	55272	58272	-	-	-
60	50	55271	58271	77271	-	-
75	62	-	-	77875	-	-
90	74	-	-	77874	-	-
125	103	55270	58270	77270	-	-
147	122	55269	58269	-	-	-
160	132	55268	58268	-	-	-
173	144	55264	-	-	-	-
200	165	55267	-	-	-	-
300	247	55265	-	-	-	-
550	466	55266	-	-	-	-

Physical Characteristics	
Window Area	3.63 mm^2
Cross Section	9.20 mm^2
Path Length	13.6 mm
Volume	125 mm^3
Weight - MPP	1.1 g
Weight - High Flux	1.0 g
Weight - Kool Mμ	0.77 g
Weight - XFLUX	-
Weight - Kool Mμ MAX	-
Area Product	33.4 mm^4

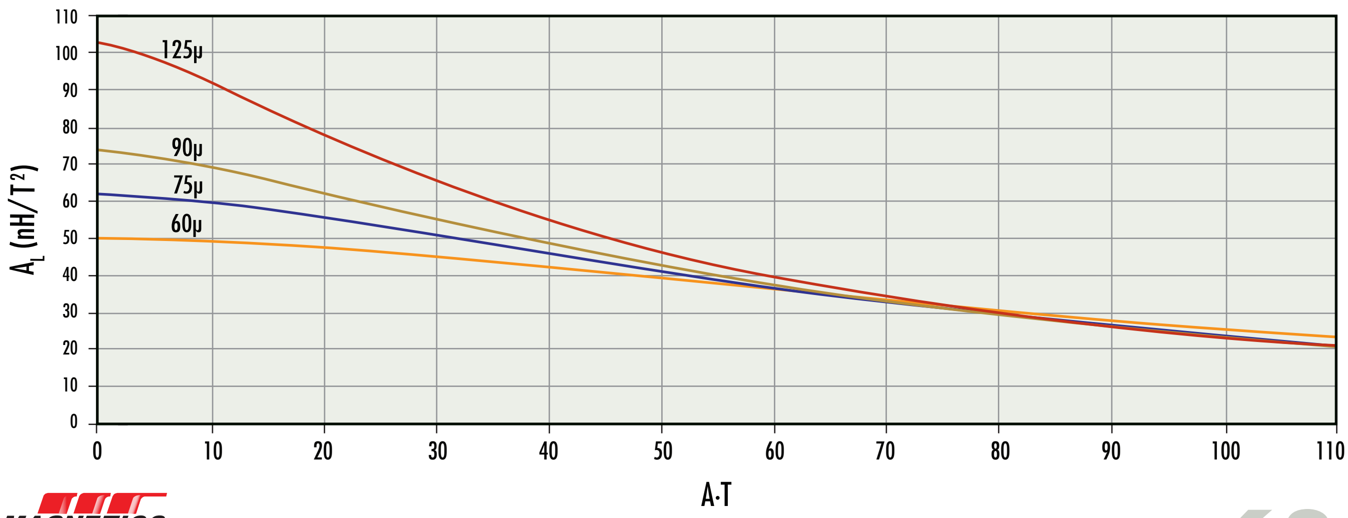
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	16.2
20%	16.7
25%	16.9
30%	17.0
35%	17.1
40%	17.3
45%	17.4
50%	17.6
60%	17.9
70%	18.3

Wound Coil Dimensions		
40% Winding Factor	OD	7.41 mm
	HT	6.11 mm
Completely Full Window	Max OD	9.17 mm
	Max HT	7.42 mm

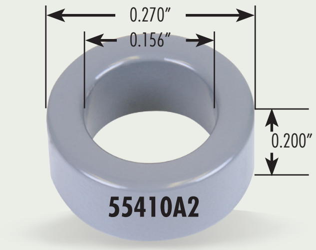
Surface Area	
Unwound Core	230 mm^2
40% Winding Factor	260 mm^2

Kool Mμ A_L vs. DC Bias



6.86 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	6.86 mm/0.270 in	3.96 mm/0.156 in	5.08 mm/0.200 in
After Finish (limits)	7.50 mm/0.295 in	3.45 mm/0.136 in	5.72 mm/0.225 in



Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
14	8	55413	58413	-	-	-
26	14	55412	58412	-	-	-
60	33	55411	58411	77411	-	-
75	42	-	-	77415	-	-
90	50	-	-	77414	-	-
125	70	55410	58410	77410	-	-
147	81	55409	58409	-	-	-
160	89	55408	58408	-	-	-
173	95	55404	-	-	-	-
200	112	55407	-	-	-	-
300	166	55405	-	-	-	-

Physical Characteristics	
Window Area	9.35 mm^2
Cross Section	7.25 mm^2
Path Length	16.5 mm
Volume	120 mm^3
Weight - MPP	1.0 g
Weight - High Flux	0.94 g
Weight - Kool Mµ	0.74 g
Weight - XFLUX	-
Weight - Kool Mµ MAX	-
Area Product	67.8 mm^4

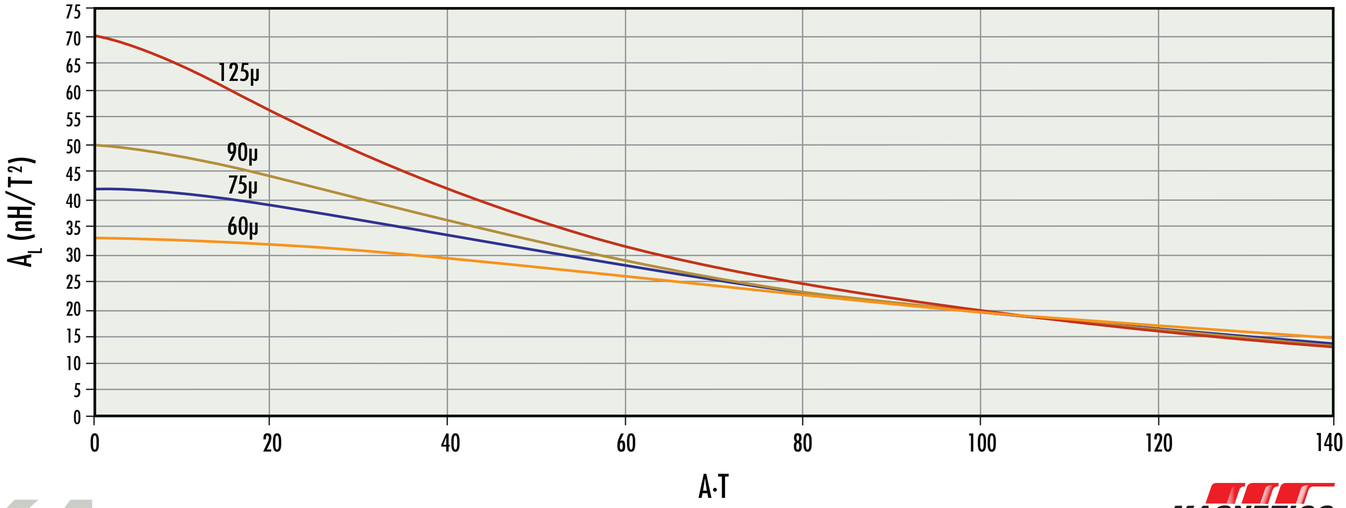
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	15.5
20%	16.4
25%	16.6
30%	16.8
35%	17.0
40%	17.3
45%	17.5
50%	17.8
60%	18.3
70%	18.9

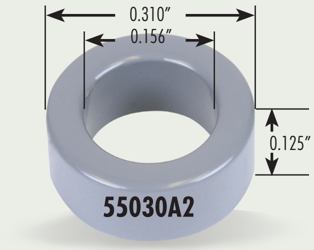
Wound Coil Dimensions		
40% Winding Factor	OD	8.06 mm
	HT	6.84 mm
Completely Full Window	Max OD	9.60 mm
	Max HT	10.0 mm

Surface Area	
Unwound Core	260 mm^2
40% Winding Factor	330 mm^2

Kool Mµ A_L vs. DC Bias



7.87 mm OD



Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	7.87 mm/0.310 in	3.96 mm/0.156 in	3.18 mm/0.125 in
After Finish (limits)	8.51 mm/0.335 in	3.45 mm/0.136 in	3.81 mm/0.150 in

Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	6	55033	58033	-	-	-
26	11	55032	58032	-	-	-
60	25	55031	58031	77031	-	-
75	31	-	-	77835	-	-
90	37	-	-	77834	-	-
125	52	55030	58030	77030	-	-
147	62	55029	58029	-	-	-
160	66	55028	58028	-	-	-
173	73	55024	-	-	-	-
200	83	55027	-	-	-	-
300	124	55025	-	-	-	-
550	229	55026	-	-	-	-

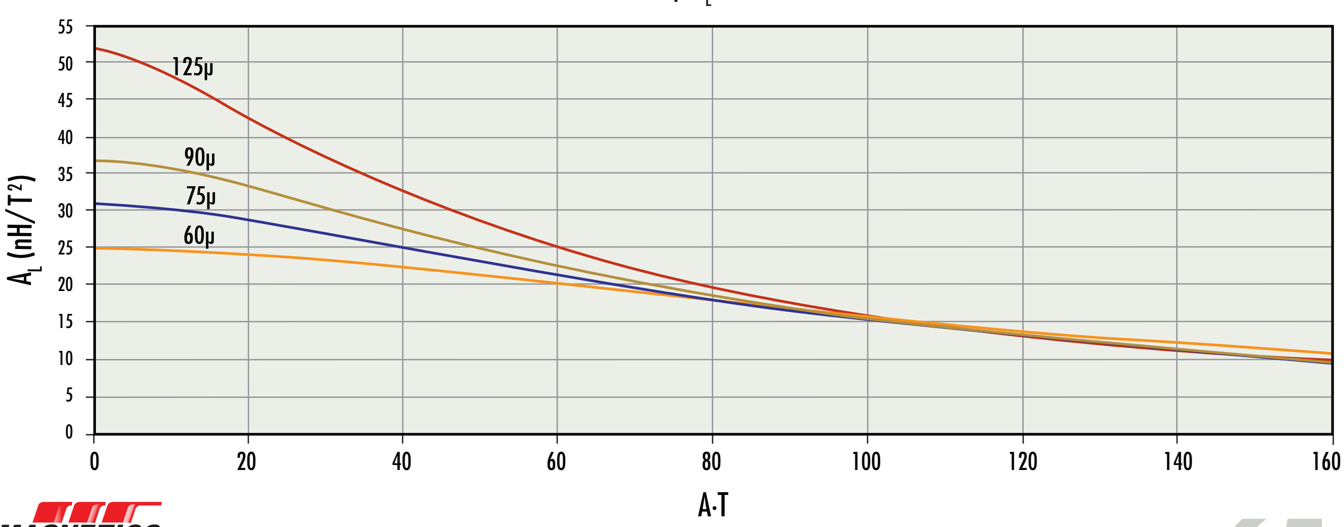
Physical Characteristics	
Window Area	9.35 mm^2
Cross Section	5.99 mm^2
Path Length	17.9 mm
Volume	107 mm^3
Weight - MPP	0.92 g
Weight - High Flux	0.87 g
Weight - Kool Mμ	0.68 g
Weight - XFlux	-
Weight - Kool Mμ MAX	-
Area Product	56.0 mm^4

Winding Turn Length * Reference General Winding Data pgs. 103 - 107	
Winding Factor	Length/Turn (mm)
0%	12.7
20%	13.6
25%	13.8
30%	14.0
35%	14.3
40%	14.5
45%	14.7
50%	15.0
60%	15.5
70%	16.1

Wound Coil Dimensions		
40% Winding Factor	OD	9.07 mm
	HT	4.93 mm
Completely Full Window	Max OD	11.0 mm
	Max HT	6.73 mm

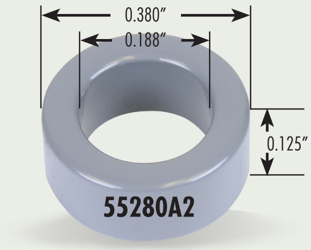
Surface Area	
Unwound Core	240 mm^2
40% Winding Factor	310 mm^2

Kool Mμ A_L vs. DC Bias



9.65 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	9.65 mm/0.380 in	4.78 mm/0.188 in	3.18 mm/0.125 in
After Finish (limits)	10.3 mm/0.405 in	4.26 mm/0.168 in	3.81 mm/0.150 in



Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
14	6	55283	58283	-	-	-
26	11	55282	58282	-	-	-
60	25	55281	58281	77281	-	-
75	32	-	-	77885	-	-
90	38	-	-	77884	-	-
125	53	55280	58280	77280	-	-
147	63	55279	58279	-	-	-
160	68	55278	58278	-	-	-
173	74	55274	-	-	-	-
200	84	55277	-	-	-	-
300	128	55275	-	-	-	-
550	232	55276	-	-	-	-

Physical Characteristics	
Window Area	14.3 mm^2
Cross Section	7.52 mm^2
Path Length	21.8 mm
Volume	164 mm^3
Weight - MPP	1.4 g
Weight - High Flux	1.3 g
Weight - Kool Mµ	1.0 g
Weight - XFLUX	-
Weight - Kool Mµ MAX	-
Area Product	107 mm^4

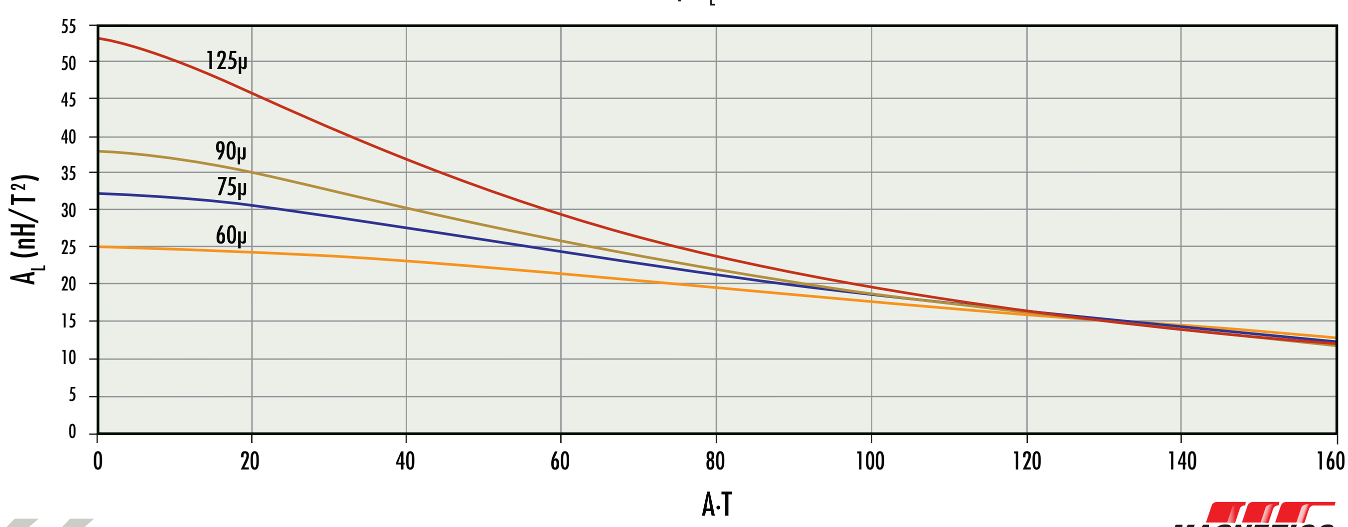
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	13.6
20%	14.7
25%	15.0
30%	15.3
35%	15.6
40%	15.9
45%	16.2
50%	16.5
60%	17.2
70%	17.9

Wound Coil Dimensions		
40% Winding Factor	OD	11.0 mm
	HT	5.17 mm
Completely Full Window	Max OD	13.4 mm
	Max HT	7.44 mm

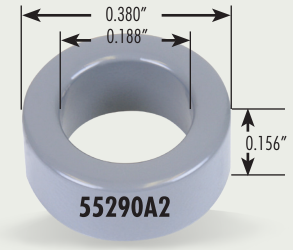
Surface Area	
Unwound Core	310 mm^2
40% Winding Factor	410 mm^2

Kool Mµ A_L vs. DC Bias



9.65 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	9.65 mm/0.380 in	4.78 mm/0.188 in	3.96 mm/0.156 in
After Finish (limits)	10.3 mm/0.405 in	4.26 mm/0.168 in	4.60 mm/0.181 in



Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	7	55293	58293	-	-	-
26	14	55292	58292	-	-	-
60	32	55291	58291	77291	-	-
75	40	-	-	77295	-	-
90	48	-	-	77294	-	-
125	66	55290	58290	77290	-	-
147	78	55289	58289	-	-	-
160	84	55288	58288	-	-	-
173	92	55284	-	-	-	-
200	105	55287	-	-	-	-
300	159	55285	-	-	-	-
550	290	55286	-	-	-	-

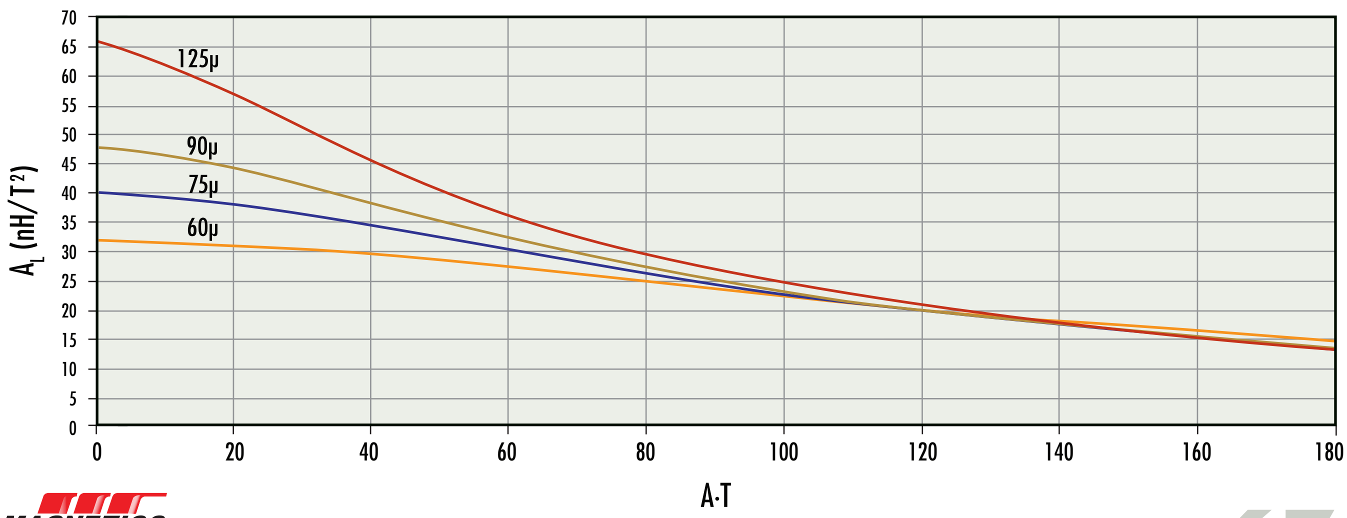
Physical Characteristics	
Window Area	14.3 mm²
Cross Section	9.45 mm²
Path Length	21.8 mm
Volume	206 mm³
Weight - MPP	1.8 g
Weight - High Flux	1.7 g
Weight - Kool Mμ	1.4 g
Weight - XFlux	-
Weight - Kool Mμ MAX	-
Area Product	135 mm⁴

Winding Turn Length * *Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	15.2
20%	16.4
25%	16.6
30%	16.9
35%	17.2
40%	17.4
45%	17.8
50%	18.1
60%	18.7
70%	19.5

Wound Coil Dimensions		
40% Winding Factor	OD	11.0 mm
	HT	5.96 mm
Completely Full Window	Max OD	13.4 mm
	Max HT	8.20 mm

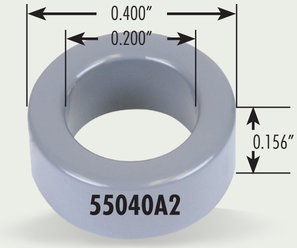
Surface Area	
Unwound Core	350 mm²
40% Winding Factor	450 mm²

Kool Mμ A_L vs. DC Bias



10.2 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	10.2 mm/0.400 in	5.08 mm/0.200 in	3.96 mm/0.156 in
After Finish (limits)	10.8 mm/0.425 in	4.57 mm/0.180 in	4.60 mm/0.181 in



Permeability (µ)	A_L ± 8% Kool Mµ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
14	7	55043	58043	-	-	-
26	14	55042	58042	-	-	-
60	32	55041	58041	77041	-	-
75	40	-	-	77845	-	-
90	48	-	-	77844	-	-
125	66	55040	58040	77040	-	-
147	78	55039	58039	-	-	-
160	84	55038	58038	-	-	-
173	92	55034	-	-	-	-
200	105	55037	-	-	-	-
300	159	55035	-	-	-	-
550	290	55036	-	-	-	-

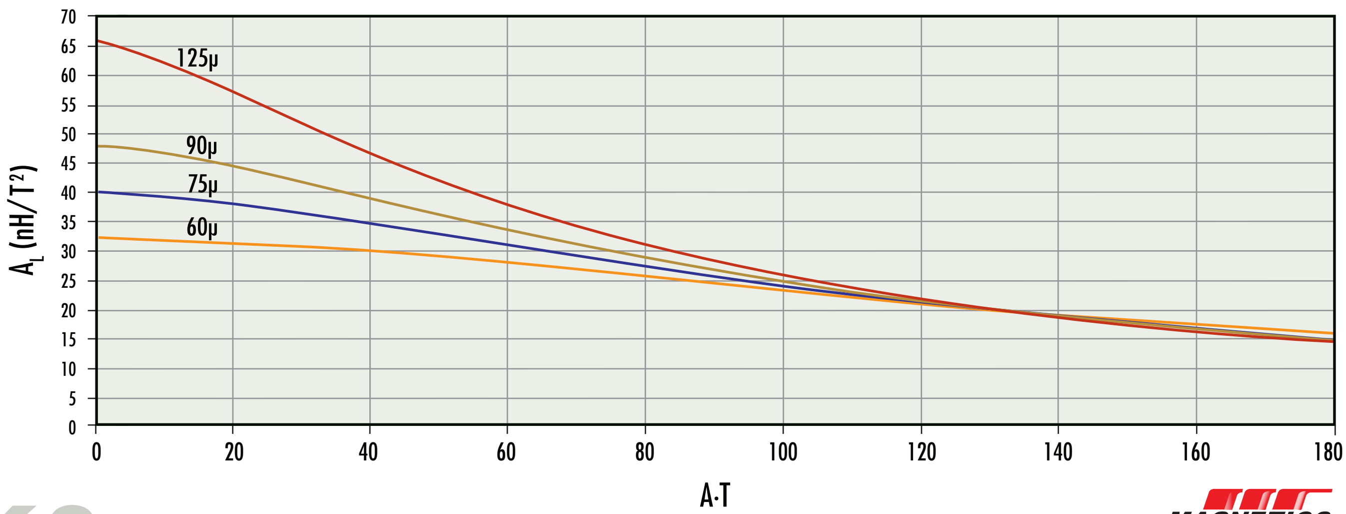
Physical Characteristics	
Window Area	16.4 mm^2
Cross Section	9.57 mm^2
Path Length	23.0 mm
Volume	220 mm^3
Weight - MPP	1.9 g
Weight - High Flux	1.8 g
Weight - Kool Mµ	1.5 g
Weight - XFLUX	-
Weight - Kool Mµ MAX	-
Area Product	156 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	15.4
20%	16.6
25%	16.9
30%	17.1
35%	17.5
40%	17.8
45%	18.1
50%	18.4
60%	19.2
70%	20.0

Wound Coil Dimensions		
40% Winding Factor	OD	11.5 mm
	HT	5.96 mm
Completely Full Window	Max OD	14.1 mm
	Max HT	8.46 mm

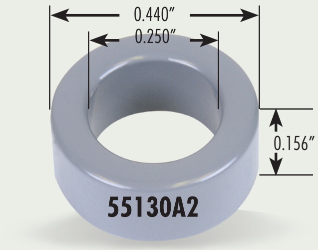
Surface Area	
Unwound Core	370 mm^2
40% Winding Factor	480 mm^2

Kool Mµ A_L vs. DC Bias



11.2 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	11.2 mm/0.440 in	6.35 mm/0.250 in	3.96 mm/0.156 in
After Finish (limits)	11.9 mm/0.465 in	5.84 mm/0.230 in	4.60 mm/0.181 in



Permeability (μ)	A_L ± 8% Kool Mμ A_L ± 12%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	6	55133	58133	-	-	-
26	11	55132	58132	-	-	-
60	26	55131	58131	77131	-	-
75	32	-	-	77335	-	-
90	38	-	-	77334	-	-
125	53	55130	58130	77130	-	-
147	63	55129	58129	-	-	-
160	68	55128	58128	-	-	-
173	74	55124	-	-	-	-
200	85	55127	-	-	-	-
300	127	55125	-	-	-	-

Physical Characteristics	
Window Area	26.8 mm²
Cross Section	9.06 mm²
Path Length	26.9 mm
Volume	244 mm³
Weight - MPP	2.1 g
Weight - High Flux	2.0 g
Weight - Kool Mμ	1.5 g
Weight - XFLUX	-
Weight - Kool Mμ MAX	-
Area Product	243 mm⁴

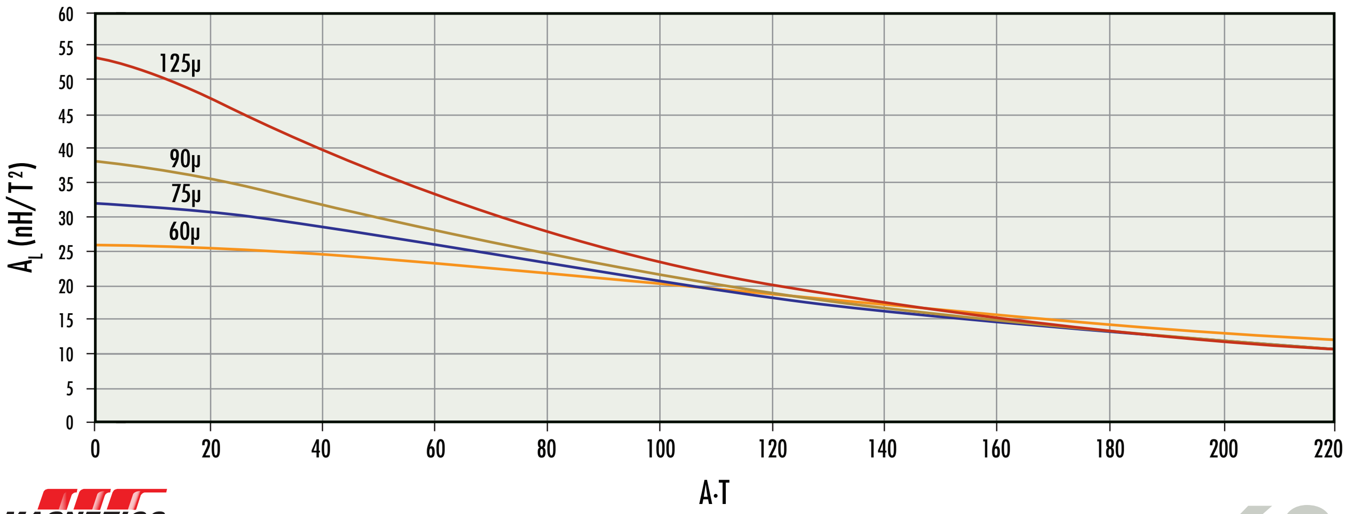
Wound Coil Dimensions		
40% Winding Factor	OD	12.9 mm
	HT	6.53 mm
Completely Full Window	Max OD	15.7 mm
	Max HT	8.97 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	15.2
20%	16.7
25%	17.0
30%	17.4
35%	17.8
40%	18.1
45%	18.6
50%	19.0
60%	19.9
70%	20.9

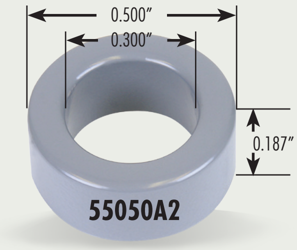
Surface Area	
Unwound Core	420 mm²
40% Winding Factor	600 mm²

Kool Mμ A_L vs. DC Bias



12.7 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	12.7 mm/0.500 in	7.62 mm/0.300 in	4.75 mm/0.187 in
After Finish (limits)	13.5 mm/0.530 in	6.98 mm/0.275 in	5.52 mm/0.217 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	6.4	55053	58053	-	-	-
26	12	55052	58052	77052	78052	79052
40	18	-	-	-	78056	-
60	27	55051	58051	77051	78051	79051
75	34	-	-	77055	78055	-
90	40	-	-	77054	78054	-
125	56	55050	58050	77050	-	-
147	67	55049	58049	-	-	-
160	72	55048	58048	-	-	-
173	79	55044	-	-	-	-
200	90	55047	-	-	-	-
300	134	55045	-	-	-	-
550	255	55046	-	-	-	-

Physical Characteristics	
Window Area	38.3 mm²
Cross Section	10.9 mm²
Path Length	31.2 mm
Volume	340 mm³
Weight - MPP	3.1 g
Weight - High Flux	2.9 g
Weight - Kool Mμ	2.2 g
Weight - XFLUX	2.5 g
Weight - Kool Mμ MAX	2.2 g
Area Product	417 mm⁴

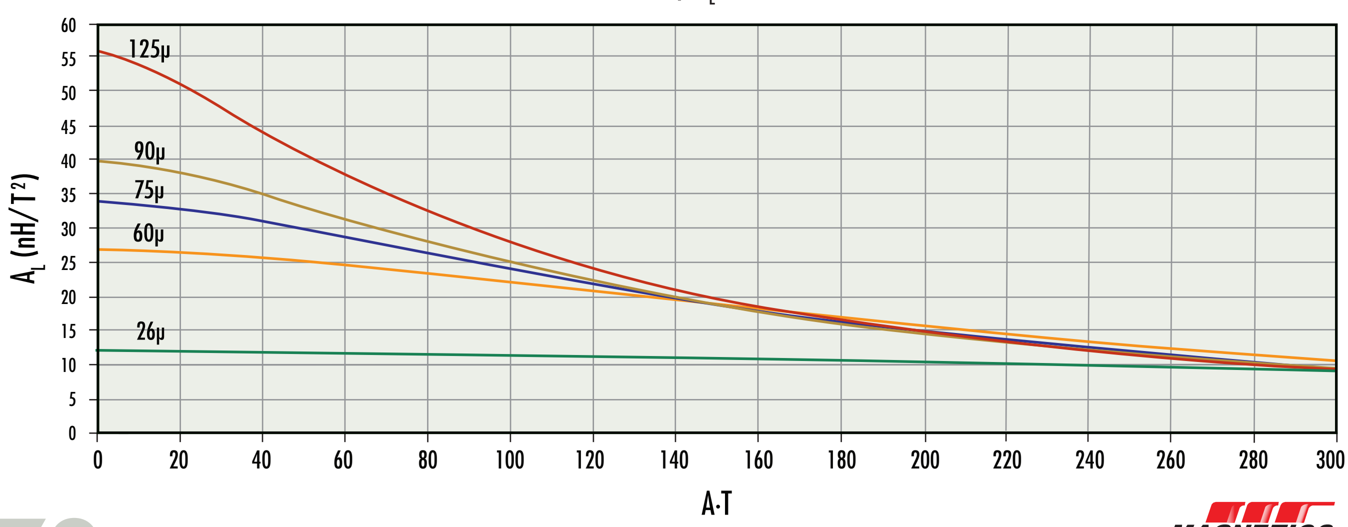
Wound Coil Dimensions		
40% Winding Factor	OD	14.6 mm
	HT	7.66 mm
Completely Full Window	Max OD	18.2 mm
	Max HT	11.5 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	17.5
20%	19.3
25%	19.8
30%	20.1
35%	20.7
40%	21.1
45%	21.7
50%	22.1
60%	23.2
70%	24.5

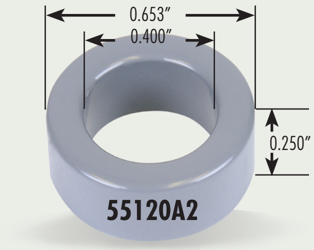
Surface Area	
Unwound Core	560 mm²
40% Winding Factor	800 mm²

Kool Mμ A_L vs. DC Bias



16.6 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	16.6 mm/0.653 in	10.2 mm/0.400 in	6.35 mm/0.250 in
After Finish (limits)	17.3 mm/0.680 in	9.52 mm/0.375 in	7.12 mm/0.280 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	8	55123	58123	-	-	-
26	15	55122	58122	-	78122	79122
40	24	-	-	-	78113	-
60	35	55121	58121	77121	78121	79121
75	43	-	-	77225	78225	-
90	52	-	-	77224	78224	-
125	72	55120	58120	77120	-	-
147	88	55119	58119	-	-	-
160	92	55118	58118	-	-	-
173	104	55114	-	-	-	-
200	115	55117	-	-	-	-
300	173	55115	-	-	-	-
550	317	55116	-	-	-	-

Physical Characteristics	
Window Area	71.2 mm^2
Cross Section	19.2 mm^2
Path Length	41.2 mm
Volume	791 mm^3
Weight - MPP	6.8 g
Weight - High Flux	6.3 g
Weight - Kool Mμ	5.0 g
Weight - XFLUX	5.6 g
Weight - Kool Mμ MAX	4.9 g
Area Product	1,370 mm^4

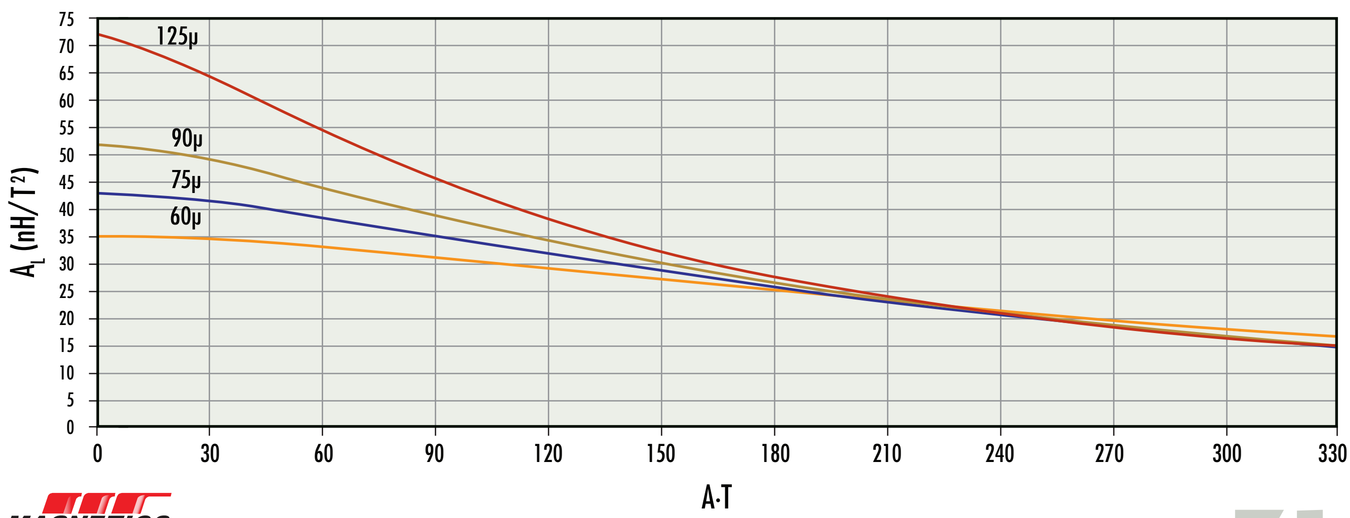
Wound Coil Dimensions		
40% Winding Factor	OD	18.8 mm
	HT	10.1 mm
Completely Full Window	Max OD	23.7 mm
	Max HT	15.2 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	22.1
20%	24.6
25%	25.2
30%	25.6
35%	26.4
40%	27.0
45%	27.7
50%	28.4
60%	29.8
70%	31.5

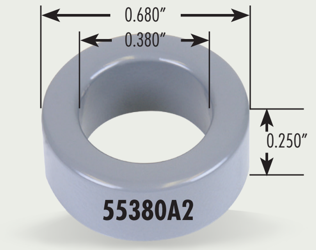
Surface Area	
Unwound Core	920 mm^2
40% Winding Factor	1,300 mm^2

Kool Mμ A_L vs. DC Bias



17.3 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	17.3 mm/0.680 in	9.65 mm/0.380 in	6.35 mm/0.250 in
After Finish (limits)	18.1 mm/0.710 in	9.01 mm/0.355 in	7.12 mm/0.280 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	10	55383	58383	-	-	-
26	19	55382	58382	-	78382	79382
40	28	-	-	-	78386	-
60	43	55381	58381	77381	78381	79381
75	53	-	-	77385	78385	-
90	64	-	-	77384	78384	-
125	89	55380	58380	77380	-	-
147	105	55379	58379	-	-	-
160	114	55378	58378	-	-	-
173	123	55374	-	-	-	-
200	142	55377	-	-	-	-
300	214	55375	-	-	-	-

Physical Characteristics	
Window Area	63.8 mm^2
Cross Section	23.2 mm^2
Path Length	41.4 mm
Volume	960 mm^3
Weight - MPP	8.2 g
Weight - High Flux	7.7 g
Weight - Kool Mμ	5.9 g
Weight - XFlux	7.2 g
Weight - Kool Mμ MAX	5.9 g
Area Product	1,480 mm^4

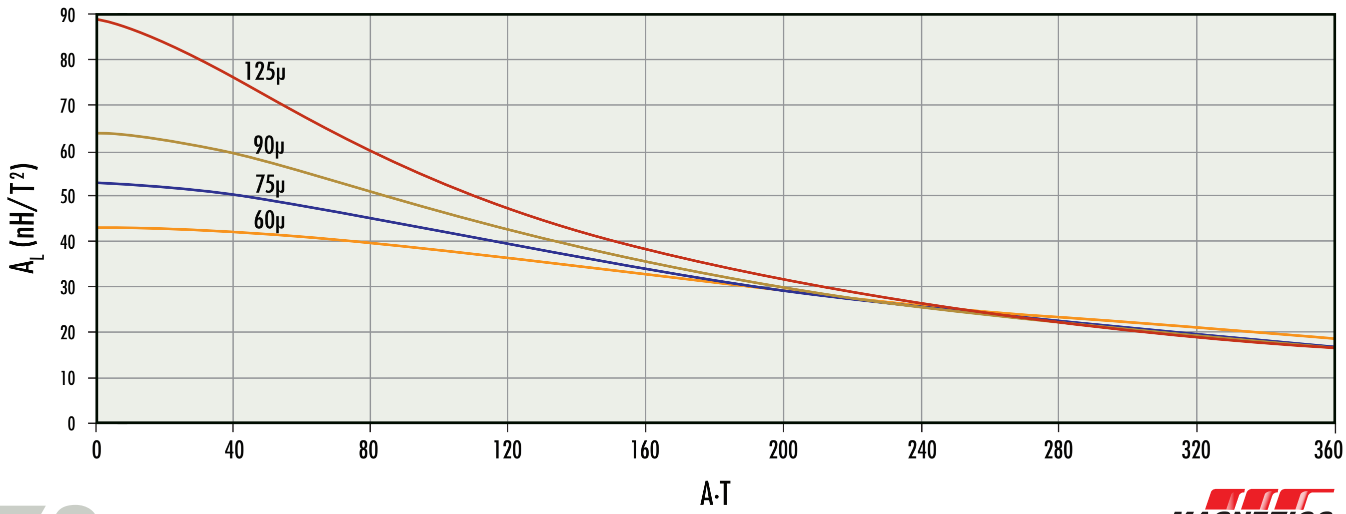
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	23.2
20%	25.6
25%	26.2
30%	26.6
35%	27.4
40%	28.0
45%	28.6
50%	29.3
60%	30.8
70%	32.4

Wound Coil Dimensions		
40% Winding Factor	OD	19.6 mm
	HT	10.1 mm
Completely Full Window	Max OD	24.9 mm
	Max HT	16.3 mm

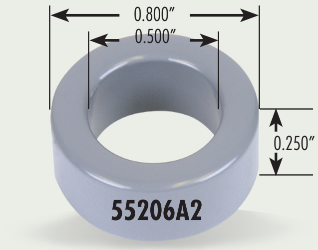
Surface Area	
Unwound Core	990 mm^2
40% Winding Factor	1,400 mm^2

Kool Mμ A_L vs. DC Bias



20.3 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	20.3 mm/0.800 in	12.7 mm/0.500 in	6.35mm/0.250 in
After Finish (limits)	21.1 mm/0.830 in	12.0 mm/0.475 in	7.12 mm/0.280 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	7.8	55209	58209	-	-	-
26	14	55208	58208	-	78208	79208
40	21	-	-	77847	78847	-
60	32	55848	58848	77848	78848	79848
75	41	-	-	77211	78211	-
90	49	-	-	77210	78210	-
125	68	55206	58206	77206	-	-
147	81	55205	58205	-	-	-
160	87	55204	58204	-	-	-
173	96	55200	-	-	-	-
200	109	55203	-	-	-	-
300	163	55201	-	-	-	-
550	320	55202	-	-	-	-

Physical Characteristics	
Window Area	114 mm²
Cross Section	22.1 mm²
Path Length	50.9 mm
Volume	1,120 mm³
Weight - MPP	9.4 g
Weight - High Flux	8.9 g
Weight - Kool Mμ	7.1 g
Weight - XFLUX	7.9 g
Weight - Kool Mμ MAX	7.2 g
Area Product	2,520 mm⁴

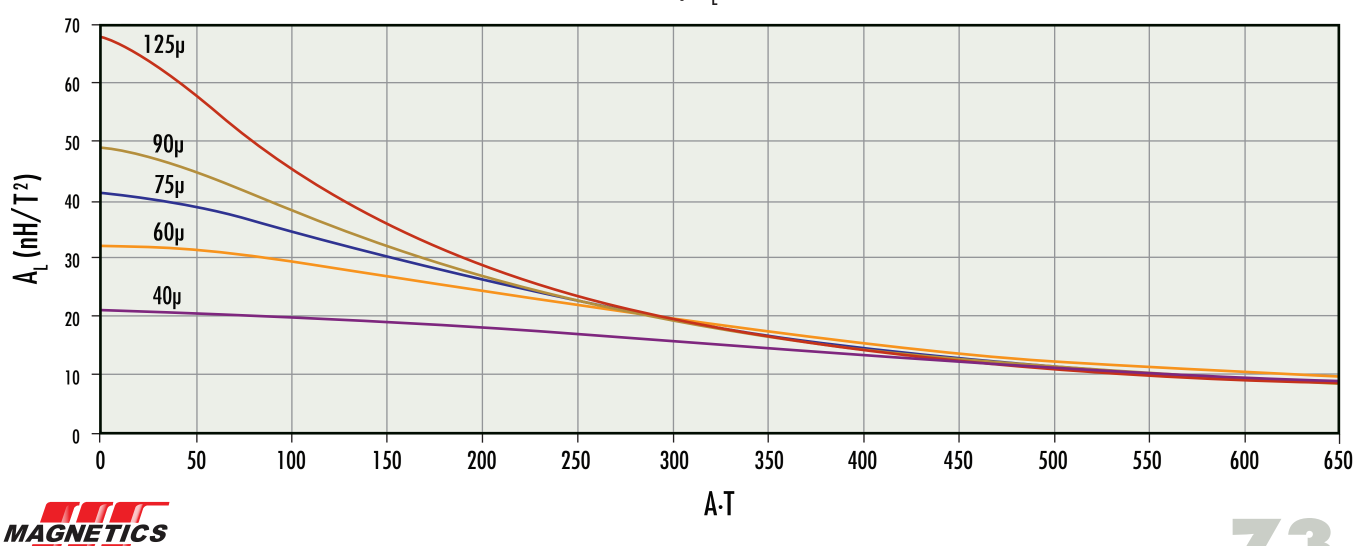
Wound Coil Dimensions		
40% Winding Factor	OD	22.9 mm
	HT	10.7 mm
Completely Full Window	Max OD	29.2 mm
	Max HT	17.4 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	23.3
20%	26.4
25%	27.2
30%	27.8
35%	28.8
40%	29.5
45%	30.5
50%	31.3
60%	33.2
70%	35.4

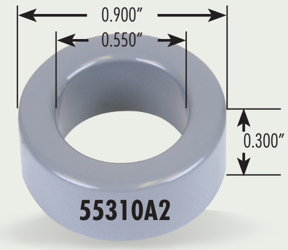
Surface Area	
Unwound Core	1,200 mm²
40% Winding Factor	1,900 mm²

Kool Mμ A_L vs. DC Bias



22.9 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	22.9 mm/0.900 in	14.0 mm/0.550 in	7.62 mm/0.300 in
After Finish (limits)	23.7 mm/0.930 in	13.3 mm/0.525 in	8.39 mm/0.330 in



Permeability (µ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
14	9.9	55313	58313	-	-	-
26	19	55312	58312	77312	78312	79312
40	29	-	-	77316	78316	-
60	43	55059	58059	77059	78059	79059
75	54	-	-	77315	78315	-
90	65	-	-	77314	78314	-
125	90	55310	58310	77310	-	-
147	106	55309	58309	-	-	-
160	115	55308	58308	-	-	-
173	124	55304	-	-	-	-
200	144	55307	-	-	-	-
300	216	55305	-	-	-	-
550	396	55306	-	-	-	-

Physical Characteristics	
Window Area	139 mm²
Cross Section	31.7 mm²
Path Length	56.7 mm
Volume	1,800 mm³
Weight - MPP	16 g
Weight - High Flux	15 g
Weight - Kool Mµ	12 g
Weight - XFLUX	13 g
Weight - Kool Mµ MAX	12 g
Area Product	4,430 mm⁴

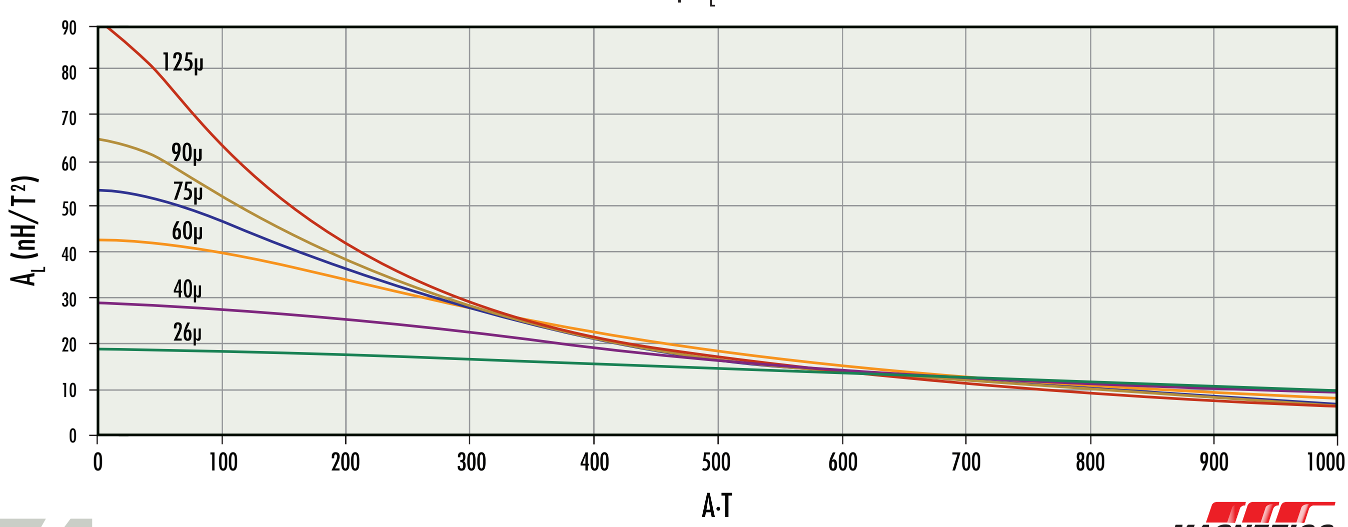
Wound Coil Dimensions		
40% Winding Factor	OD	25.7 mm
	HT	12.4 mm
Completely Full Window	Max OD	32.6 mm
	Max HT	19.8 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	27.0
20%	30.5
25%	31.3
30%	32.0
35%	33.1
40%	33.9
45%	34.9
50%	35.9
60%	38.0
70%	40.4

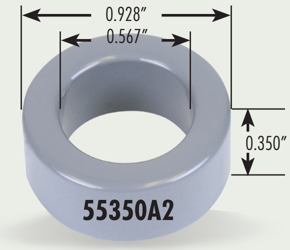
Surface Area	
Unwound Core	1,600 mm²
40% Winding Factor	2,400 mm²

Kool Mµ A_L vs. DC Bias



23.6 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	23.6 mm/0.928 in	14.4 mm/0.567 in	8.89 mm/0.350 in
After Finish (limits)	24.4 mm/0.958 in	13.7 mm/0.542 in	9.66 mm/0.380 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	12	55353	58353	-	-	-
26	22	55352	58352	77352	78352	79352
40	34	-	-	77356	78356	-
60	51	55351	58351	77351	78351	79351
75	62	-	-	77355	78355	-
90	76	-	-	77354	78354	-
125	105	55350	58350	77350	-	-
147	124	55349	58349	-	-	-
160	135	55348	58348	-	-	-
173	146	55344	-	-	-	-
200	169	55347	-	-	-	-
300	253	55345	-	-	-	-

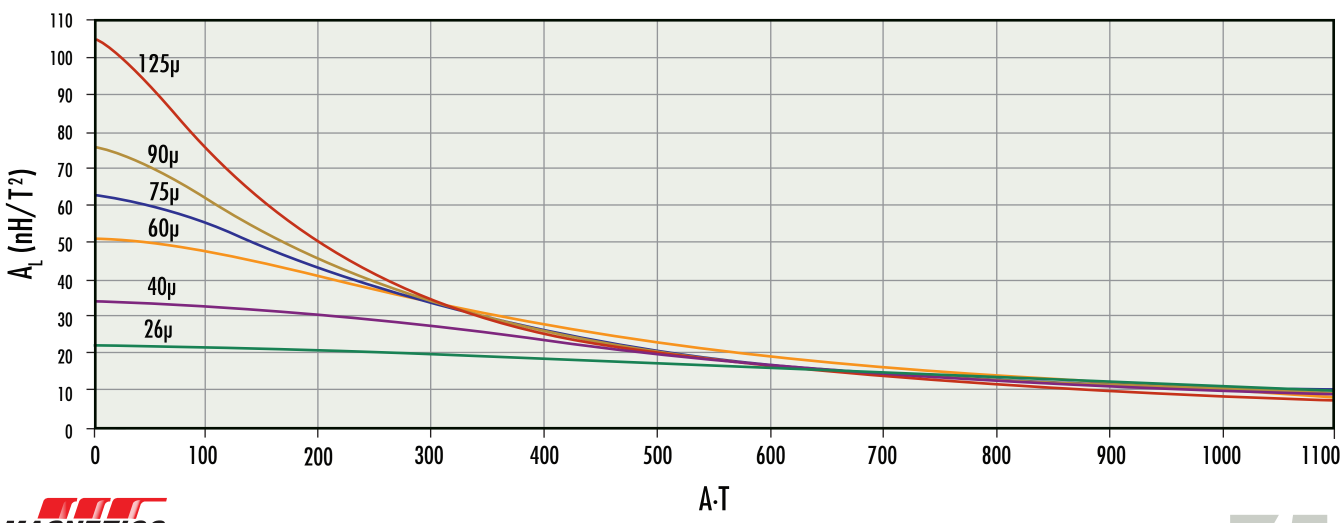
Physical Characteristics	
Window Area	149 mm²
Cross Section	38.8 mm²
Path Length	58.8 mm
Volume	2,280 mm³
Weight - MPP	20 g
Weight - High Flux	19 g
Weight - Kool Mμ	14 g
Weight - XFLUX	16 g
Weight - Kool Mμ MAX	14 g
Area Product	5,770 mm⁴

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	29.8
20%	33.4
25%	34.2
30%	35.0
35%	36.1
40%	36.9
45%	38.0
50%	38.9
60%	41.1
70%	43.6

Wound Coil Dimensions		
40% Winding Factor	OD	26.7 mm
	HT	14.2 mm
Completely Full Window	Max OD	33.5 mm
	Max HT	21.4 mm

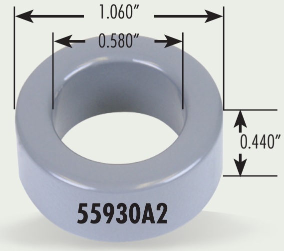
Surface Area	
Unwound Core	1,800 mm²
40% Winding Factor	2,700 mm²

Kool Mμ A_L vs. DC Bias



26.9 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	26.90 mm/1.060 in	14.7 mm/0.580 in	11.2 mm/0.440 in
After Finish (limits)	27.69 mm/1.090 in	14.1 mm/0.555 in	12.0 mm/0.470 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	18	55933	58933	-	-	-
26	32	55932	58932	77932	78932	79932
40	50	-	-	77936	78936	-
60	75	55894	58894	77894	78894	79894
75	94	-	-	77935	78935	-
90	113	-	-	77934	78934	-
125	157	55930	58930	77930	-	-
147	185	55929	58929	-	-	-
160	201	55928	58928	-	-	-
173	217	55924	-	-	-	-
200	251	55927	-	-	-	-
300	377	55925	-	-	-	-
550	740	55926	-	-	-	-

Physical Characteristics	
Window Area	156 mm²
Cross Section	65.4 mm²
Path Length	63.5 mm
Volume	4,150 mm³
Weight - MPP	36 g
Weight - High Flux	34 g
Weight - Kool Mμ	26 g
Weight - XFlux	29 g
Weight - Kool Mμ MAX	26 g
Area Product	10,200 mm⁴

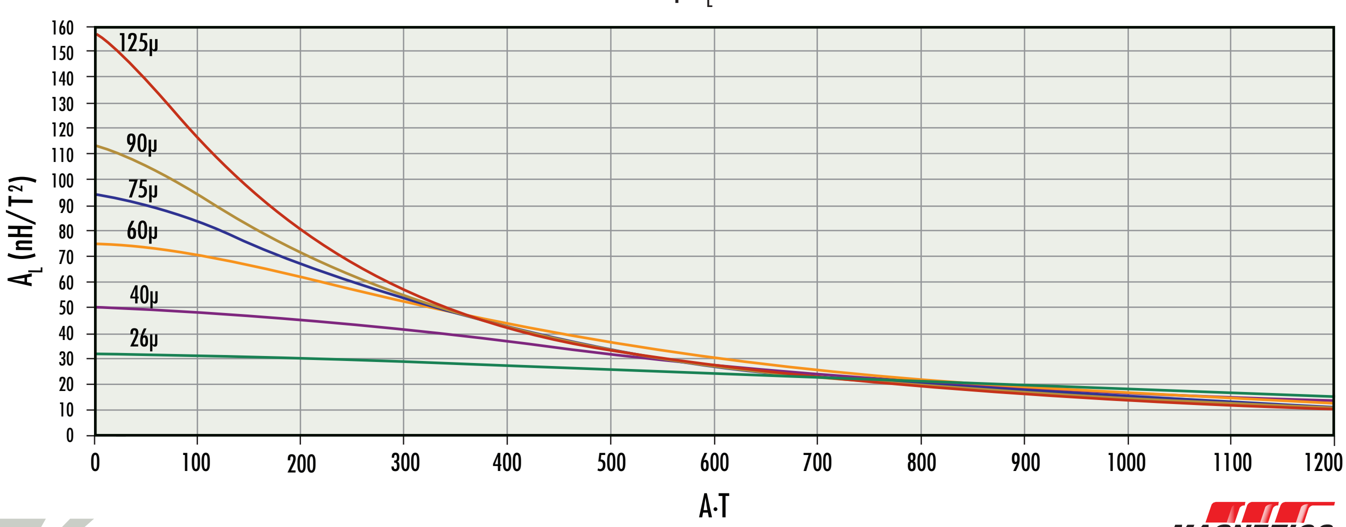
Wound Coil Dimensions		
40% Winding Factor	OD	30.0 mm
	HT	16.5 mm
Completely Full Window	Max OD	37.3 mm
	Max HT	24.0 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	37.5
20%	41.1
25%	41.9
30%	42.8
35%	43.8
40%	44.6
45%	45.7
50%	46.6
60%	48.8
70%	51.3

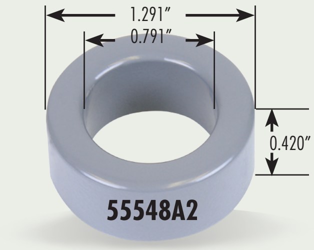
Surface Area	
Unwound Core	2,400 mm²
40% Winding Factor	3,500 mm²

Kool Mμ A_L vs. DC Bias



32.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	32.8 mm/1.291 in	20.1 mm/0.791 in	10.7 mm/0.420 in
After Finish (limits)	33.66 mm/1.325 in	19.4 mm/0.766 in	11.5 mm/0.450 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	14	55551	58551	-	-	-
26	28	55550	58550	77550	78550	79550
40	41	-	-	77555	78555	-
60	61	55071	58071	77071	78071	79071
75	76	-	-	77553	78553	-
90	91	-	-	77552	78552	-
125	127	55548	58548	77548	-	-
147	150	55547	58547	-	-	-
160	163	55546	58546	-	-	-
173	176	55542	-	-	-	-
200	203	55545	-	-	-	-
300	305	55543	-	-	-	-
550	559	55544	-	-	-	-

Physical Characteristics

Window Area	297 mm^2
Cross Section	65.6 mm^2
Path Length	81.4 mm
Volume	5,340 mm^3
Weight - MPP	47 g
Weight - High Flux	44 g
Weight - Kool Mμ	34 g
Weight - XFLUX	38 g
Weight - Kool Mμ MAX	34 g
Area Product	19,500 mm^4

Wound Coil Dimensions

40% Winding Factor	OD	36.8 mm
	HT	17.8 mm
Completely Full Window	Max OD	46.7 mm
	Max HT	28.0 mm

Winding Turn Length

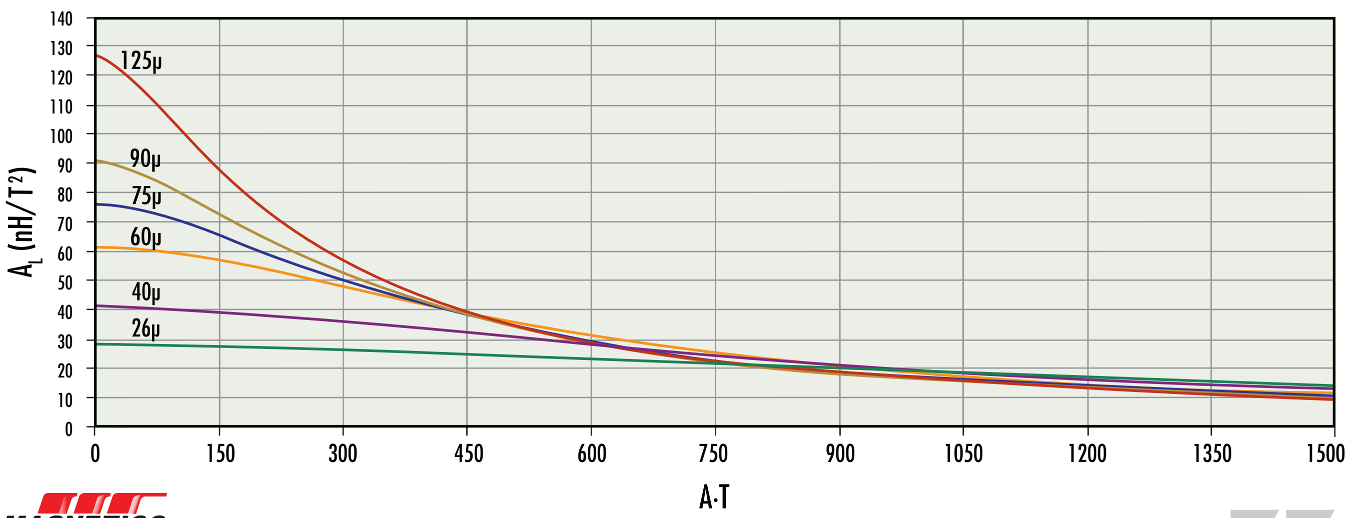
** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	37.4
20%	42.4
25%	43.5
30%	44.7
35%	46.1
40%	47.2
45%	48.8
50%	50.1
60%	53.2
70%	56.7

Surface Area

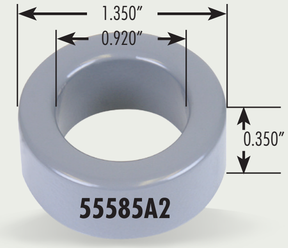
Unwound Core	3,100 mm^2
40% Winding Factor	4,900 mm^2

Kool Mμ A_L vs. DC Bias



34.3 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	34.30 mm/1.350 in	23.4 mm/0.920 in	8.89 mm/0.350 in
After Finish (limits)	35.18 mm/1.385 in	22.5 mm/0.888 in	9.78 mm/0.385 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	9	55588	58588	-	-	-
26	16	55587	58587	77587	78587	79587
40	25	-	-	77591	78591	-
60	38	55586	58586	77586	78586	79586
75	47	-	-	77590	78590	-
90	57	-	-	77589	78589	-
125	79	55585	58585	77585	-	-
147	93	55584	58584	-	-	-
160	101	55583	58583	-	-	-
173	109	55579	-	-	-	-
200	126	55582	-	-	-	-
300	190	55580	-	-	-	-
550	348	55581	-	-	-	-

Physical Characteristics	
Window Area	399 mm^2
Cross Section	46.4 mm^2
Path Length	89.5 mm
Volume	4,150 mm^3
Weight - MPP	35 g
Weight - High Flux	33 g
Weight - Kool Mμ	25 g
Weight - XFLUX	29 g
Weight - Kool Mμ MAX	26 g
Area Product	18,500 mm^4

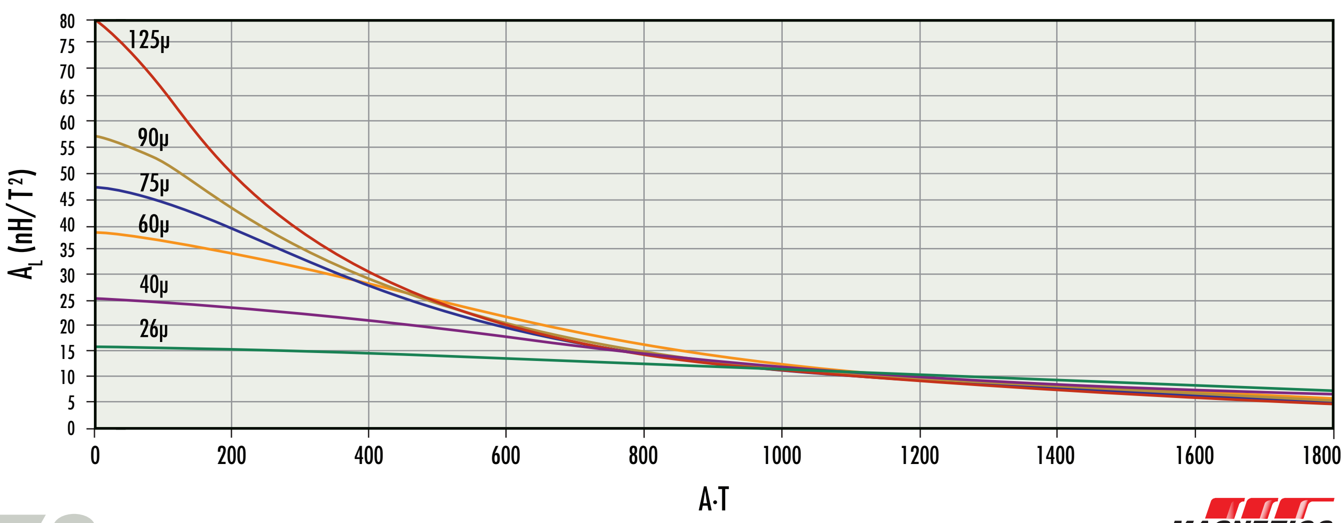
Wound Coil Dimensions		
40% Winding Factor	OD	40.5 mm
	HT	16.8 mm
Completely Full Window	Max OD	50.1 mm
	Max HT	29.0 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	32.2
20%	38.1
25%	39.6
30%	40.6
35%	42.5
40%	44.0
45%	45.6
50%	47.3
60%	50.8
70%	54.9

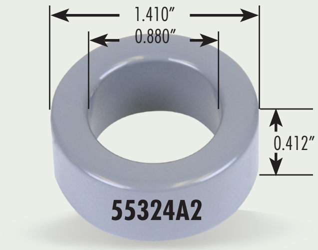
Surface Area	
Unwound Core	2,900 mm^2
40% Winding Factor	5,500 mm^2

Kool Mμ A_L vs. DC Bias



35.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	35.80 mm/1.410 in	22.4 mm/0.880 in	10.5 mm/0.412 in
After Finish (limits)	36.71 mm/1.445 in	21.5 mm/0.848 in	11.4 mm/0.447 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	13	55327	58327	-	-	-
26	24	55326	58326	77326	78326	79326
40	37	-	-	77330	78330	-
60	56	55076	58076	77076	78076	79076
75	70	-	-	77329	78329	-
90	84	-	-	77328	78328	-
125	117	55324	58324	77324	-	-
147	138	55323	58323	-	-	-
160	150	55322	58322	-	-	-
173	162	55318	-	-	-	-
200	187	55321	-	-	-	-
300	281	55319	-	-	-	-
550	515	55320	-	-	-	-

Physical Characteristics	
Window Area	364 mm²
Cross Section	67.8 mm²
Path Length	89.8 mm
Volume	6,090 mm³
Weight - MPP	52 g
Weight - High Flux	49 g
Weight - Kool Mμ	37 g
Weight - XFLUX	43 g
Weight - Kool Mμ MAX	38 g
Area Product	24,700 mm⁴

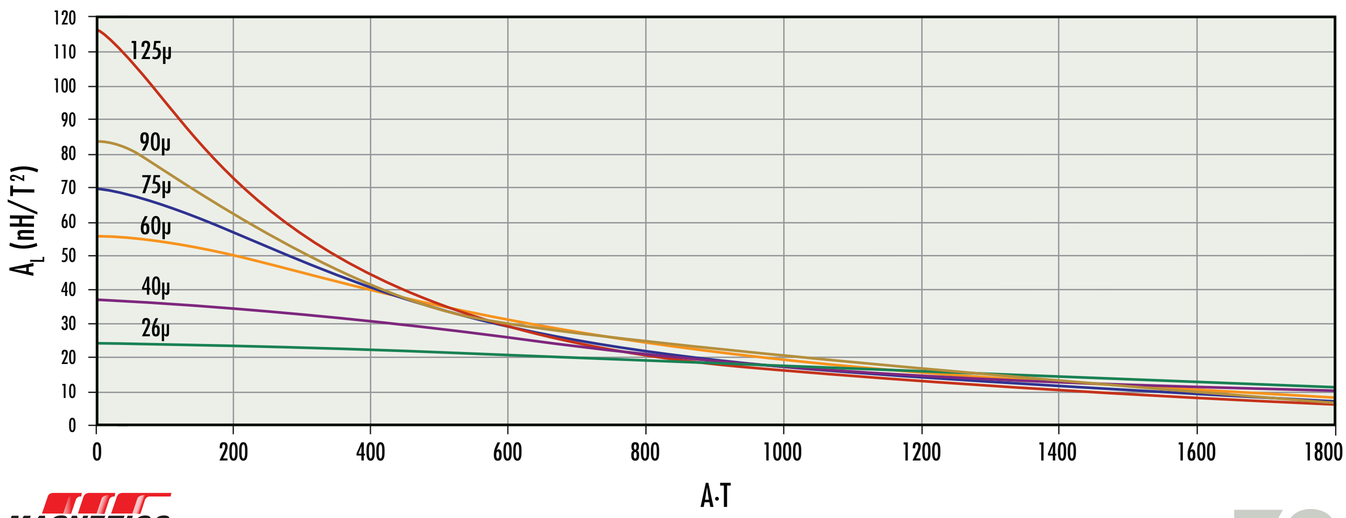
Wound Coil Dimensions		
40% Winding Factor	OD	40.2 mm
	HT	18.4 mm
Completely Full Window	Max OD	51.1 mm
	Max HT	29.6 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	37.9
20%	43.5
25%	44.8
30%	46.0
35%	47.6
40%	48.9
45%	50.6
50%	52.0
60%	55.5
70%	59.3

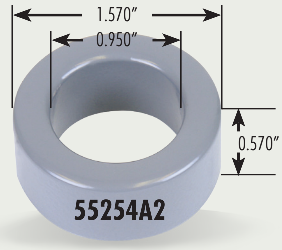
Surface Area	
Unwound Core	3,400 mm²
40% Winding Factor	5,700 mm²

Kool Mμ A_L vs. DC Bias



39.9 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	39.90 mm/1.570 in	24.1 mm/0.950 in	14.5 mm/0.570 in
After Finish (limits)	40.77 mm/1.605 in	23.3 mm/0.918 in	15.4 mm/0.605 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	19	55257	58257	-	-	-
26	35	55256	58256	77256	78256	79256
40	54	-	-	77260	78260	-
60	81	55083	58083	77083	78083	79083
75	101	-	-	77259	78259	-
90	121	-	-	77258	78258	-
125	168	55254	58254	77254	-	-
147	198	55253	58253	-	-	-
160	215	55252	58252	-	-	-
173	233	55248	-	-	-	-
200	269	55251	-	-	-	-
300	403	55249	-	-	-	-
550	740	55250	-	-	-	-

Physical Characteristics	
Window Area	427 mm²
Cross Section	107 mm²
Path Length	98.4 mm
Volume	10,600 mm³
Weight - MPP	92 g
Weight - High Flux	87 g
Weight - Kool Mμ	65 g
Weight - XFLUX	78 g
Weight - Kool Mμ MAX	65 g
Area Product	45,800 mm⁴

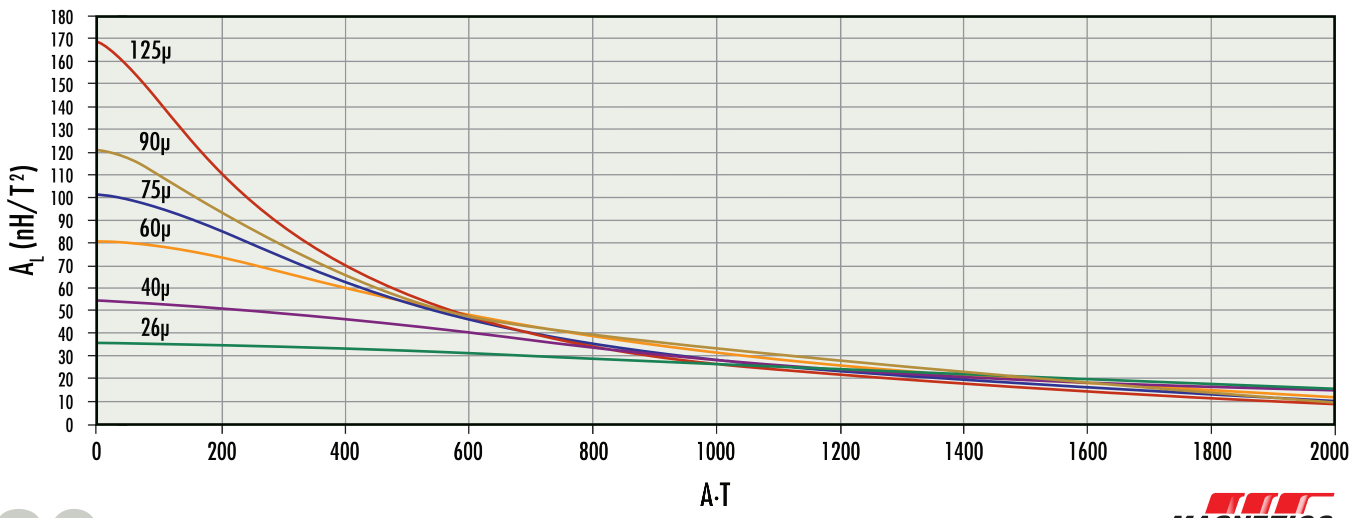
Wound Coil Dimensions		
40% Winding Factor	OD	44.3 mm
	HT	22.4 mm
Completely Full Window	Max OD	56.4 mm
	Max HT	35.2 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	48.2
20%	54.3
25%	55.8
30%	57.0
35%	58.8
40%	60.2
45%	62.1
50%	63.7
60%	67.3
70%	71.5

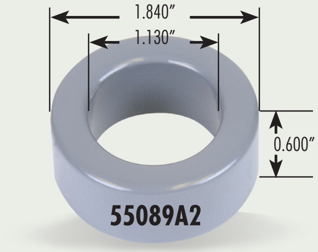
Surface Area	
Unwound Core	4,800 mm²
40% Winding Factor	7,300 mm²

Kool Mμ A_L vs. DC Bias



46.7 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	46.70 mm/1.840 in	28.70 mm/1.130 in	15.2 mm/0.600 in
After Finish (limits)	47.63 mm/1.875 in	27.88 mm/1.098 in	16.2 mm/0.635 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	20	55092	58092	-	-	-
26	37	55091	58091	77091	78091	79091
40	57	-	-	77095	78095	-
60	86	55090	58090	77090	78090	79090
75	107	-	-	77094	78094	-
90	128	-	-	77093	78093	-
125	178	55089	58089	77089	-	-
147	210	55088	-	-	-	-
160	228	55087	-	-	-	-
173	246	55082	-	-	-	-
200	285	55086	-	-	-	-
300	427	55084	-	-	-	-

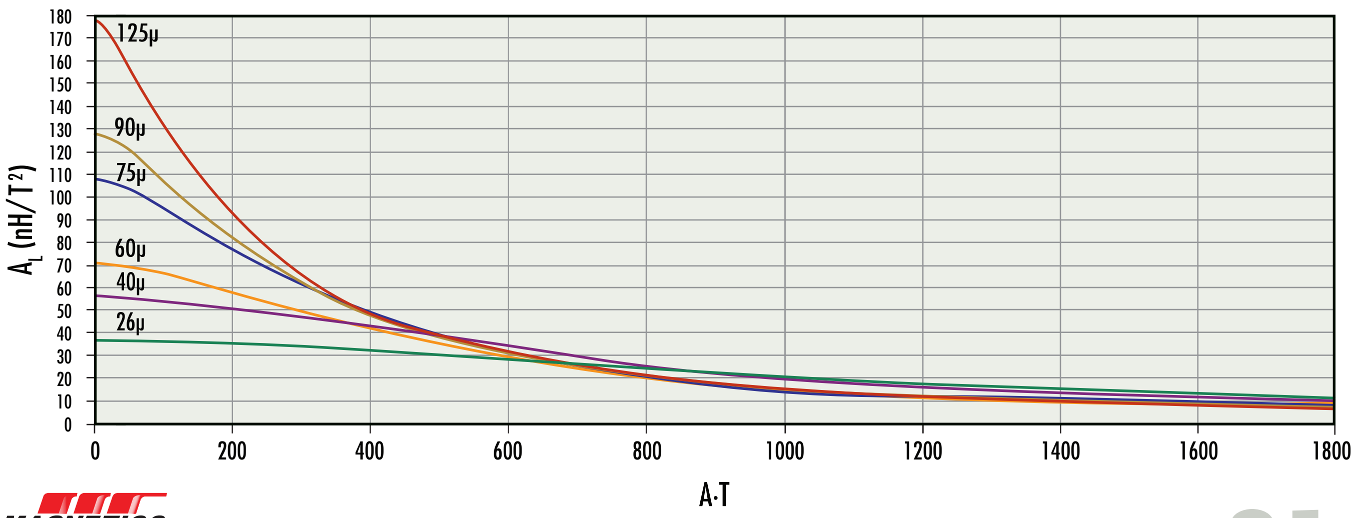
Physical Characteristics	
Window Area	610 mm^2
Cross Section	134 mm^2
Path Length	116 mm
Volume	15,600 mm^3
Weight - MPP	130 g
Weight - High Flux	120 g
Weight - Kool Mμ	96 g
Weight - XFLUX	110 g
Weight - Kool Mμ MAX	100 g
Area Product	81,800 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	52.0
20%	59.1
25%	61.0
30%	62.2
35%	64.5
40%	66.4
45%	68.2
50%	70.4
60%	74.7
70%	79.5

Wound Coil Dimensions		
40% Winding Factor	OD	52.0 mm
	HT	24.9 mm
Completely Full Window	Max OD	66.3 mm
	Max HT	39.8 mm

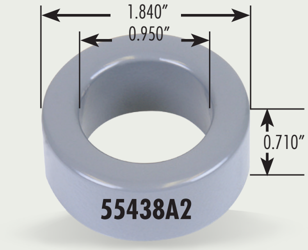
Surface Area	
Unwound Core	6,100 mm^2
40% Winding Factor	9,800 mm^2

Kool Mμ A_L vs. DC Bias



46.7 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	46.70 mm/1.840 in	24.1 mm/0.950 in	18.0 mm/0.710 in
After Finish (limits)	47.63 mm/1.875 in	23.3 mm/0.918 in	19.0 mm/0.745 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	32	55441	58441	-	-	-
26	59	55440	58440	77440	78440	79440
40	90	-	-	77431	78431	-
60	135	55439	58439	77439	78439	79439
75	169	-	-	77443	78443	-
90	202	-	-	77442	78442	-
125	281	55438	58438	77438	-	-
147	330	55437	58437	-	-	-
160	360	55436	-	-	-	-
173	390	55432	-	-	-	-
200	450	55435	-	-	-	-
300	674	55433	-	-	-	-

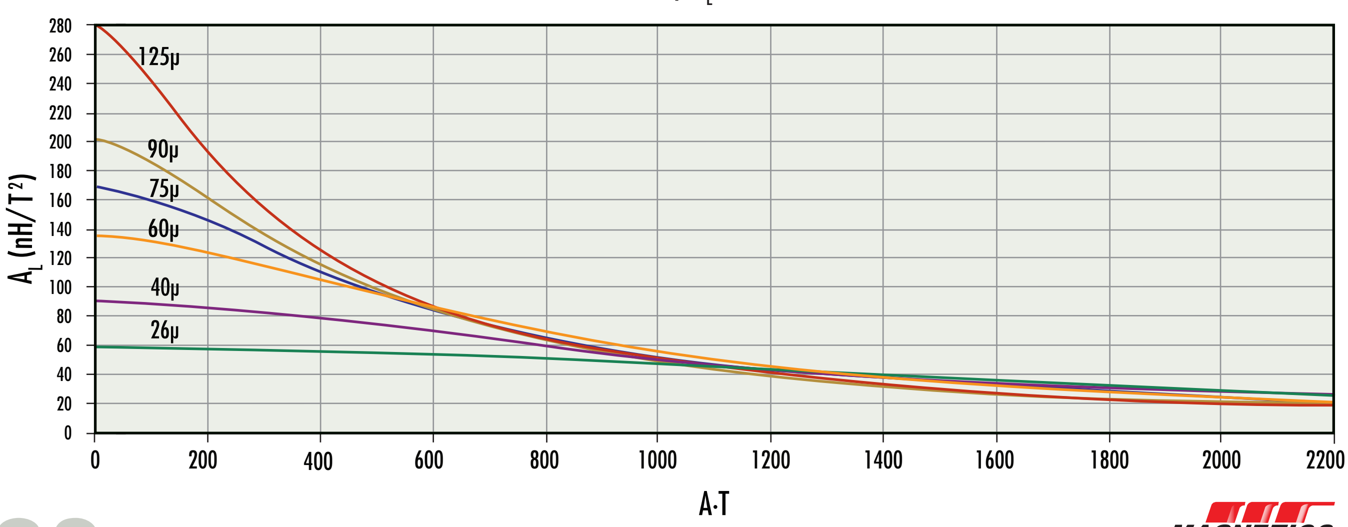
Physical Characteristics	
Window Area	427 mm^2
Cross Section	199 mm^2
Path Length	107 mm
Volume	21,300 mm^3
Weight - MPP	180 g
Weight - High Flux	170 g
Weight - Kool Mμ	130 g
Weight - XFLUX	150 g
Weight - Kool Mμ MAX	130 g
Area Product	85,900 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	62.1
20%	68.2
25%	69.7
30%	70.9
35%	72.7
40%	74.1
45%	76.0
50%	77.6
60%	81.2
70%	85.4

Wound Coil Dimensions		
40% Winding Factor	OD	51.2 mm
	HT	26.0 mm
Completely Full Window	Max OD	63.8 mm
	Max HT	38.7 mm

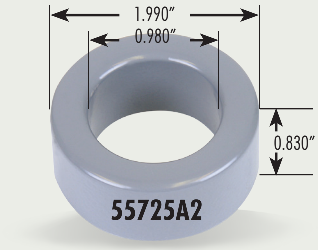
Surface Area	
Unwound Core	6,900 mm^2
40% Winding Factor	9,600 mm^2

Kool Mμ A_L vs. DC Bias



50.5 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	50.55 mm/1.990 in	24.89 mm/0.980 in	21.08 mm/0.830 in
After Finish (limits)	51.31 mm/2.020 in	23.88 mm/0.940 in	21.59 mm/0.850 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	41	55728	58728	-	-	-
26	76	55727	58727	77727	78727	79727
40	117	-	-	77733	78733	-
60	175	55726	58726	77726	78726	79726
75	219	-	-	77729	78729	-
90	263	-	-	77730	78730	-
125	366	55725	58725	77725	-	-

Physical Characteristics	
Window Area	452 mm²
Cross Section	262 mm²
Path Length	1,135 mm
Volume	29,700 mm³
Weight - MPP	250 g
Weight - High Flux	230 g
Weight - Kool Mμ	185 g
Weight - XFLUX	210 g
Weight - Kool Mμ MAX	200 g
Area Product	118,000 mm⁴

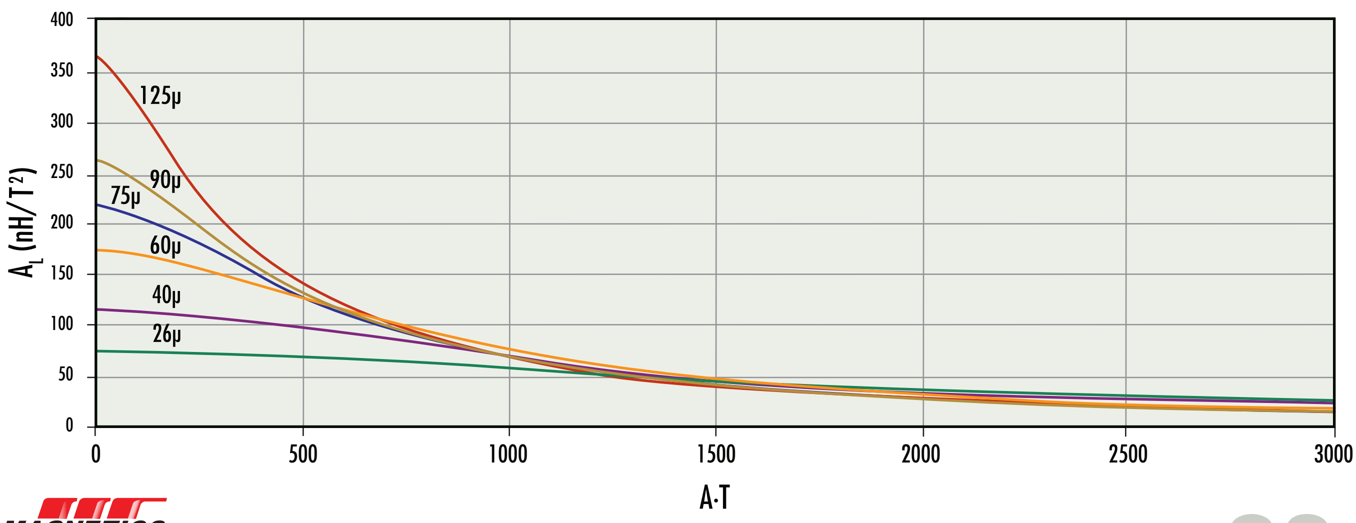
Wound Coil Dimensions		
40% Winding Factor	OD	64.0 mm
	HT	39.6 mm
Completely Full Window	Max OD	72.0 mm
	Max HT	42.0 mm

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	131
20%	137
25%	138
30%	140
35%	142
40%	143
45%	145
50%	147
60%	150
70%	155

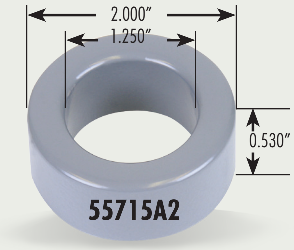
Surface Area	
Unwound Core	23,310 mm²
40% Winding Factor	33,600 mm²

Kool Mμ A_L vs. DC Bias



50.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	50.80 mm/2.000 in	31.80 mm/1.250 in	13.5 mm/0.530 in
After Finish (limits)	51.69 mm/2.035 in	30.93 mm/1.218 in	14.4 mm/0.565 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	17	55718	58718	-	-	-
26	32	55717	58717	77717	78717	79717
40	49	-	-	77721	78721	-
60	73	55716	58716	77716	78716	79716
75	91	-	-	77720	78720	-
90	109	-	-	77719	78719	-
125	152	55715	58715	77715	-	-
147	179	55714	58714	-	-	-
160	195	55713	-	-	-	-
173	210	55709	-	-	-	-
200	243	55712	-	-	-	-
300	365	55710	-	-	-	-

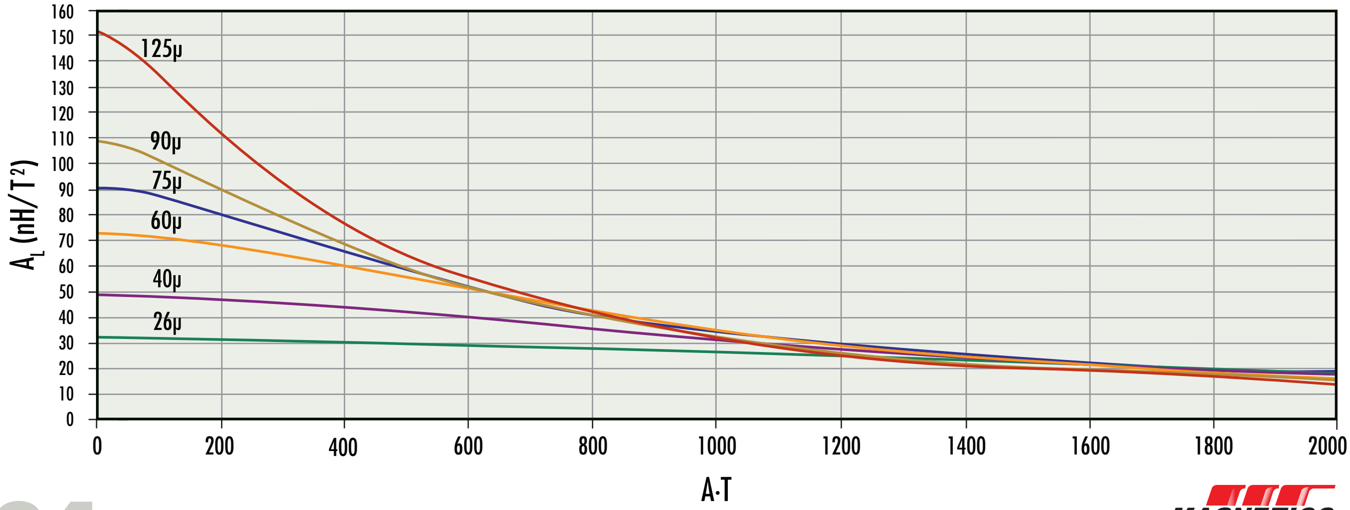
Physical Characteristics	
Window Area	751 mm^2
Cross Section	125 mm^2
Path Length	127 mm
Volume	15,900 mm^3
Weight - MPP	140 g
Weight - High Flux	130 g
Weight - Kool Mμ	98 g
Weight - XFlux	110 g
Weight - Kool Mμ MAX	98 g
Area Product	94,000 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	49.5
20%	57.4
25%	59.6
30%	61.0
35%	63.5
40%	65.5
45%	67.7
50%	70.1
60%	74.9
70%	80.3

Wound Coil Dimensions		
40% Winding Factor	OD	56.6 mm
	HT	24.2 mm
Completely Full Window	Max OD	72.4 mm
	Max HT	40.6 mm

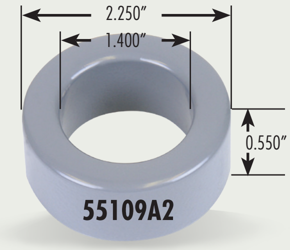
Surface Area	
Unwound Core	6,400 mm^2
40% Winding Factor	11,000 mm^2

Kool Mμ A_L vs. DC Bias



57.2 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	57.20 mm/2.250 in	35.60 mm/1.400 in	14.0 mm/0.550 in
After Finish (limits)	58.04 mm/2.285 in	34.74 mm/1.368 in	14.9 mm/0.585 in



Permeability (µ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mµ®	XFlux®	Kool Mµ® MAX
14	18	55112	58112	-	-	-
26	33	55111	58111	77111	78111	79111
40	50	-	-	77212	78212	-
60	75	55110	58110	77110	78110	79110
75	94	-	-	77214	78214	-
90	112	-	-	77213	78213	-
125	156	55109	58109	77109	-	-
147	185	55108	-	-	-	-
160	200	55107	-	-	-	-
173	218	55103	-	-	-	-
200	250	55106	-	-	-	-
300	374	55104	-	-	-	-

Physical Characteristics

Window Area	948 mm^2
Cross Section	144 mm^2
Path Length	143 mm
Volume	20,700 mm^3
Weight - MPP	180 g
Weight - High Flux	170 g
Weight - Kool Mµ	130 g
Weight - XFlux	150 g
Weight - Kool Mµ MAX	130 g
Area Product	137,000 mm^4

Winding Turn Length

** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	53.0
20%	61.9
25%	64.3
30%	65.8
35%	68.7
40%	71.0
45%	73.2
50%	76.0
60%	81.3
70%	87.1

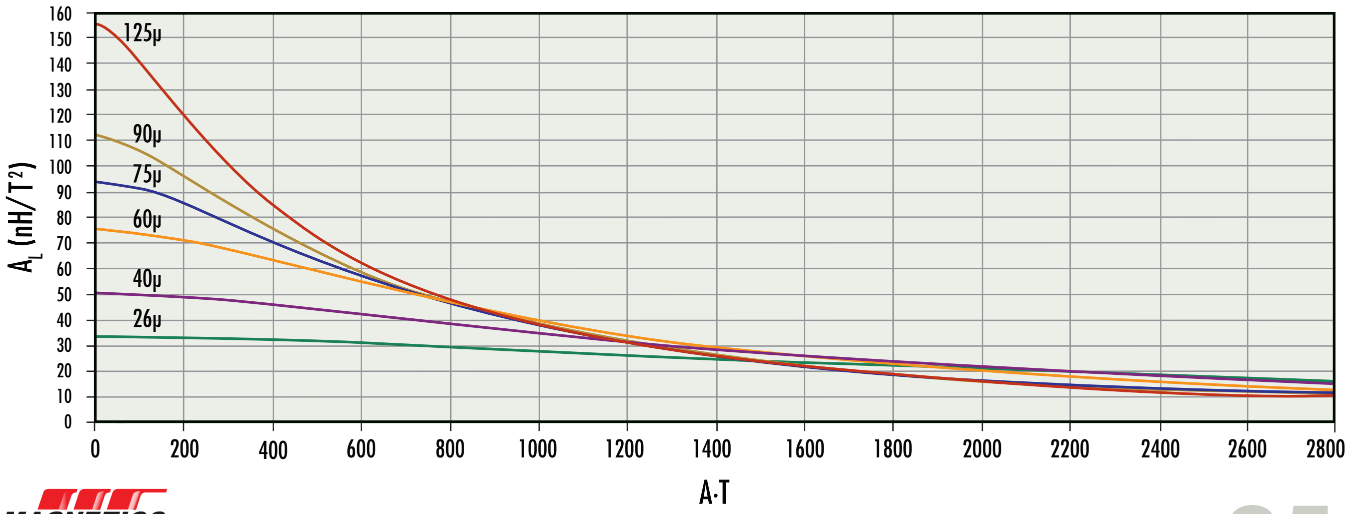
Wound Coil Dimensions

40% Winding Factor	OD	63.5 mm
	HT	25.9 mm
Completely Full Window	Max OD	81.3 mm
	Max HT	44.4 mm

Surface Area

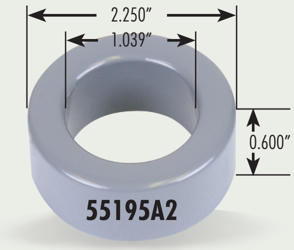
Unwound Core	7,700 mm^2
40% Winding Factor	13,000 mm^2

Kool Mµ A_L vs. DC Bias



57.2 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	57.20 mm/2.250 in	26.40 mm/1.039 in	15.2 mm/0.600 in
After Finish (limits)	58.04 mm/2.285 in	25.57 mm/1.007 in	16.2 mm/0.635 in



Permeability (µ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mµ®	XFLUX®	Kool Mµ® MAX
14	32	55190	58190	-	-	-
26	60	55191	58191	77191	78191	79191
40	92	-	-	77189	78189	-
60	138	55192	58192	77192	78192	79192
75	172	-	-	77193	78193	-
90	207	-	-	77194	78194	-
125	287	55195	58195	77195	-	-
147	306	55196	-	-	-	-
160	333	55197	-	-	-	-
173	360	55198	-	-	-	-
200	417	55199	-	-	-	-

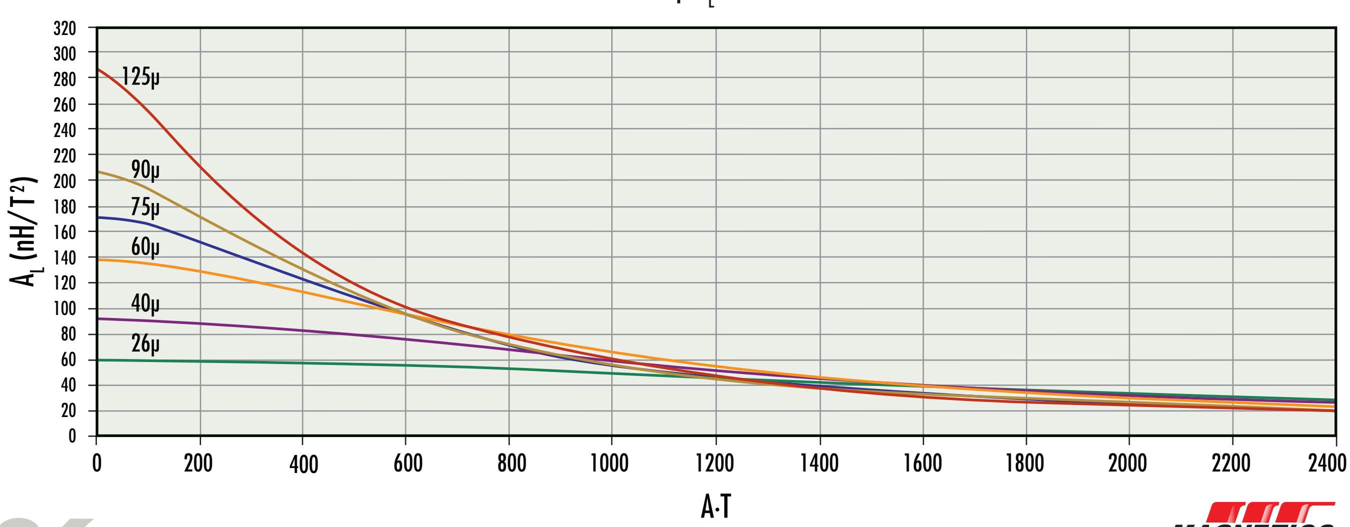
Physical Characteristics	
Window Area	514 mm^2
Cross Section	229 mm^2
Path Length	125 mm
Volume	28,600 mm^3
Weight - MPP	240 g
Weight - High Flux	230 g
Weight - Kool Mµ	180 g
Weight - XFLUX	200 g
Weight - Kool Mµ MAX	175 g
Area Product	118,000 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	64.6
20%	71.2
25%	72.9
30%	74.1
35%	76.3
40%	77.8
45%	79.8
50%	81.6
60%	85.6
70%	90.1

Wound Coil Dimensions		
40% Winding Factor	OD	62.0 mm
	HT	24.0 mm
Completely Full Window	Max OD	75.7 mm
	Max HT	34.0 mm

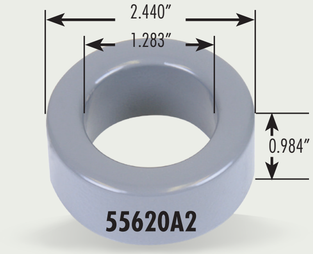
Surface Area	
Unwound Core	8,500 mm^2
40% Winding Factor	12,000 mm^2

Kool Mµ A_L vs. DC Bias



62.0 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	62.00 mm/2.440 in	32.60 mm/1.283 in	25.0 mm/0.984 in
After Finish (limits)	62.91 mm/2.477 in	31.69 mm/1.248 in	25.91 mm/1.020 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	44	55614	58614	77614	-	-
26	82	55615	58615	77615	78615	79615
40	126	-	58616	77616	78616	-
60	189	55617	58617	77617	78617	79617
75	237	-	-	77618	78618	-
90	284	-	-	77619	78619	-
125	394	55620	58620	77620	-	-

Physical Characteristics	
Window Area	789 mm²
Cross Section	360 mm²
Path Length	144 mm
Volume	51,800 mm³
Weight - MPP	460 g
Weight - High Flux	440 g
Weight - Kool Mμ	340 g
Weight - XFLUX	380 g
Weight - Kool Mμ MAX	350 g
Area Product	284,000 mm⁴

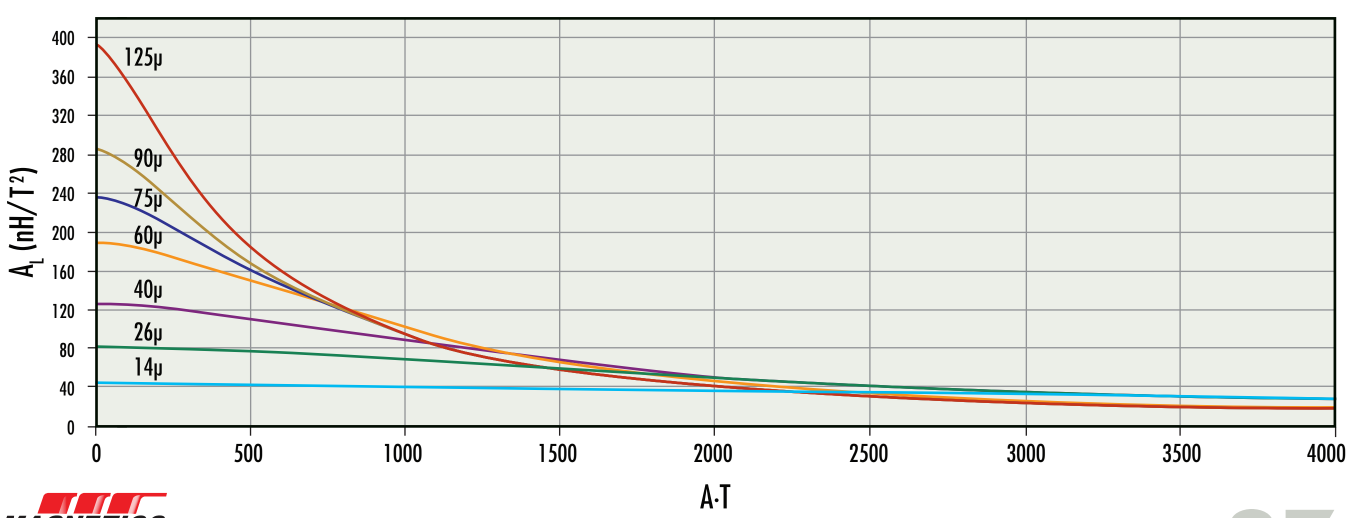
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	83.0
20%	91.3
25%	93.4
30%	94.9
35%	97.5
40%	99.5
45%	102
50%	104
60%	109
70%	115

Wound Coil Dimensions		
40% Winding Factor	OD	75.3 mm
	HT	39.7 mm
Completely Full Window	Max OD	81.4 mm
	Max HT	47.4 mm

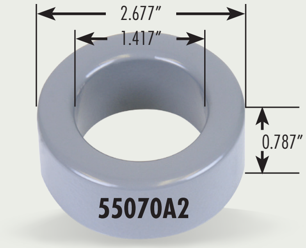
Surface Area	
Unwound Core	12,000 mm²
40% Winding Factor	21,000 mm²

Kool Mμ A_L vs. DC Bias



68.0 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	68.00 mm/2.677 in	35.99 mm/1.417 in	19.99 mm/0.787 in
After Finish (limits)	69.42 mm/2.733 in	34.67 mm/1.365 in	21.41 mm/0.843 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	35	55075	58075	77075	-	-
26	65	55074	58074	77074	78074	79074
40	100	-	58073	77073	78073	-
60	143	55072	58072	77072	78072	79072
75	187	-	-	77069	78069	-
90	225	-	-	77068	78068	-
125	312	55070	58070	77070	-	-

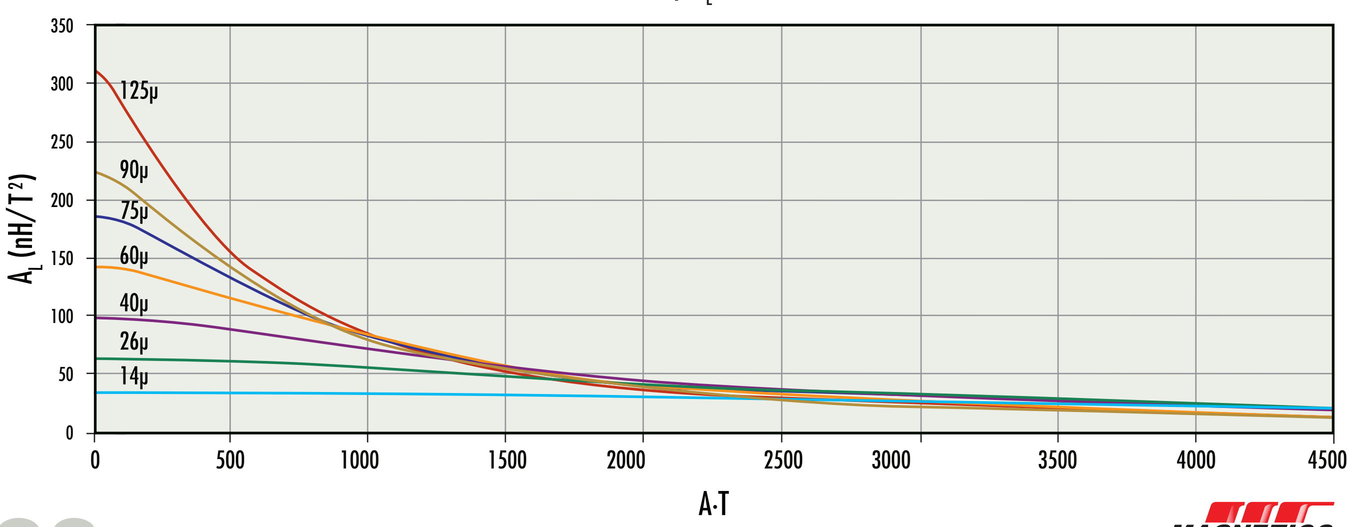
Physical Characteristics	
Window Area	945 mm^2
Cross Section	314 mm^2
Path Length	158 mm
Volume	49,700 mm^3
Weight - MPP	440 g
Weight - High Flux	420 g
Weight - Kool Mμ	320 g
Weight - XFLUX	360 g
Weight - Kool Mμ MAX	360 g
Area Product	297,000 mm^4

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	77.7
20%	86.6
25%	89.0
30%	90.5
35%	93.4
40%	95.7
45%	97.9
50%	100.1
60%	106.0
70%	112.0

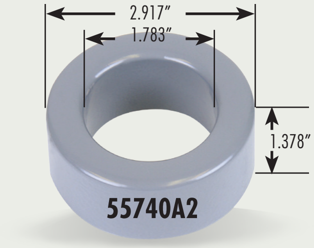
Wound Coil Dimensions		
40% Winding Factor	OD	79.3 mm
	HT	37.2 mm
Completely Full Window	Max OD	89.2 mm
	Max HT	45.4 mm

Surface Area	
Unwound Core	12,700 mm^2
40% Winding Factor	18,400 mm^2

Kool Mμ A_L vs. DC Bias



74.1 mm OD



Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	74.10 mm/2.917 in	45.30 mm/1.783 in	35.00 mm/1.378 in
After Finish (limits)	75.01 mm/2.953 in	44.39 mm/1.748 in	35.92 mm/1.414 in

Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	48	55734	58734	77734	-	-
26	88	55735	58735	77735	78735	79735
40	136	-	58736	77736	78736	-
60	204	55737	58737	77737	78737	79737
75	255	-	-	77738	78738	-
90	306	-	-	77739	78739	-
125	425	55740	-	77740	-	-

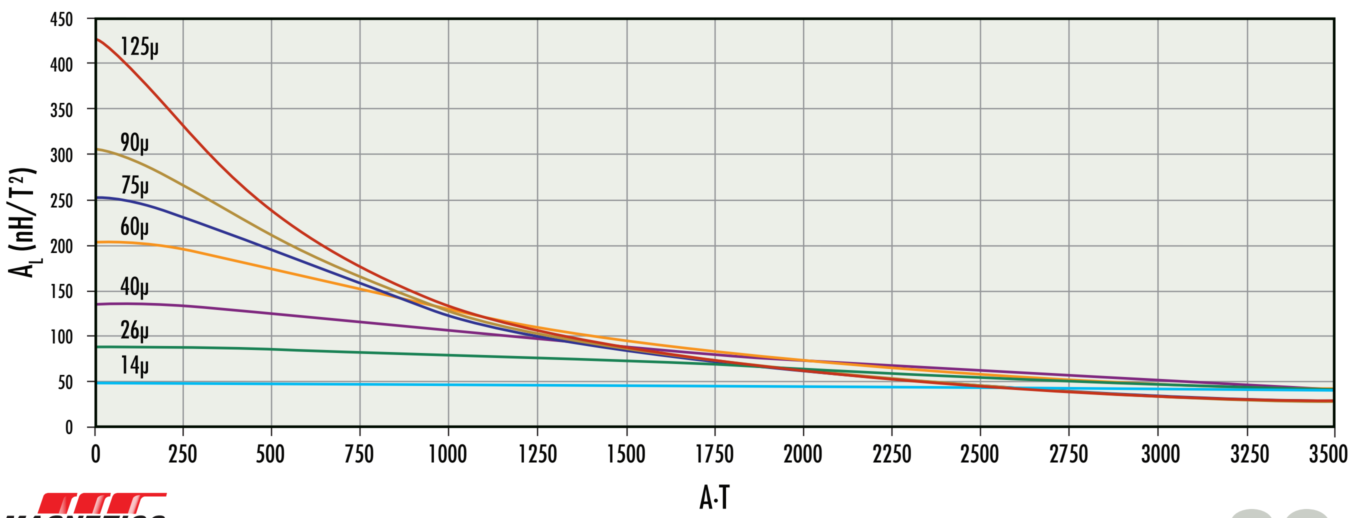
Physical Characteristics	
Window Area	1,550 mm^2
Cross Section	497 mm^2
Path Length	184 mm
Volume	91,400 mm^3
Weight - MPP	790 g
Weight - High Flux	750 g
Weight - Kool Mμ	570 g
Weight - XFLUX	660 g
Weight - Kool Mμ MAX	580 g
Area Product	769,000 mm^4

Winding Turn Length *Reference General Winding Data pgs. 103 - 107	
Winding Factor	Length/Turn (mm)
0%	102
20%	114
25%	117
30%	119
35%	122
40%	125
45%	129
50%	132
60%	139
70%	147

Wound Coil Dimensions		
40% Winding Factor	OD	91.0 mm
	HT	55.2 mm
Completely Full Window	Max OD	102 mm
	Max HT	65.7 mm

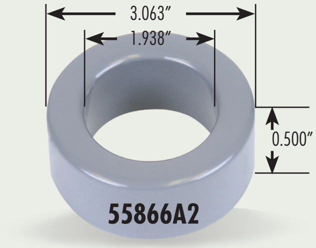
Surface Area	
Unwound Core	19,000 mm^2
40% Winding Factor	33,000 mm^2

Kool Mμ A_L vs. DC Bias



77.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	77.80 mm/3.063 in	49.20 mm/1.938 in	12.7 mm/0.500 in
After Finish (limits)	78.95 mm/3.108 in	48.20 mm/1.898 in	13.9 mm/0.545 in



Permeability (µ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mµ®	XFlux®	Kool Mµ® MAX
14	16	55869	58869	77869	-	-
26	30	55868	58868	77868	78868	79868
40	45	-	-	77872	78872	-
60	68	55867	58867	77867	78867	79867
75	85	-	-	-	78871	-
90	102	-	-	-	78870	-
125	142	55866	58866	77866	-	-

Physical Characteristics	
Window Area	1,820 mm^2
Cross Section	176 mm^2
Path Length	196 mm
Volume	34,500 mm^3
Weight - MPP	290 g
Weight - High Flux	270 g
Weight - Kool Mµ	210 g
Weight - XFlux	240 g
Weight - Kool Mµ MAX	210 g
Area Product	321,000 mm^4

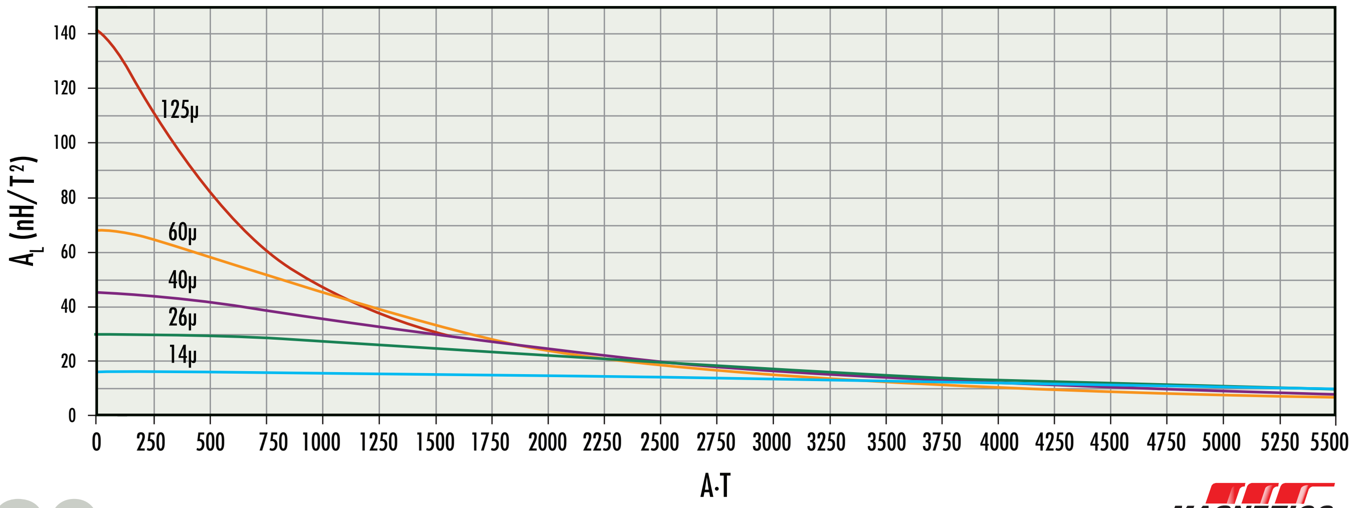
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	58.4
20%	70.9
25%	74.1
30%	76.3
35%	80.4
40%	83.5
45%	86.7
50%	90.4
60%	98.1
70%	107

Wound Coil Dimensions		
40% Winding Factor	OD	86.6 mm
	HT	29.1 mm
Completely Full Window	Max OD	112 mm
	Max HT	54.3 mm

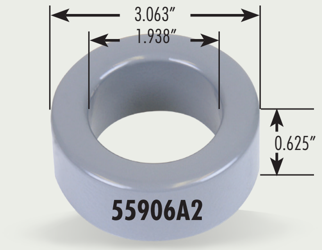
Surface Area	
Unwound Core	11,000 mm^2
40% Winding Factor	23,000 mm^2

Kool Mµ A_L vs. DC Bias



77.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	77.80 mm/3.063 in	49.20 mm/1.938 in	15.9 mm/0.625 in
After Finish (limits)	78.95 mm/3.108 in	48.20 mm/1.898 in	17.1 mm/0.670 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFlux®	Kool Mμ® MAX
14	20	55909	58909	77909	-	-
26	37	55908	58908	77908	78908	79908
40	57	-	-	77912	78912	-
60	85	55907	58907	77907	78907	79907
75	106	-	-	-	78911	-
90	128	-	-	-	78910	-
125	177	55906	58906	77906	-	-

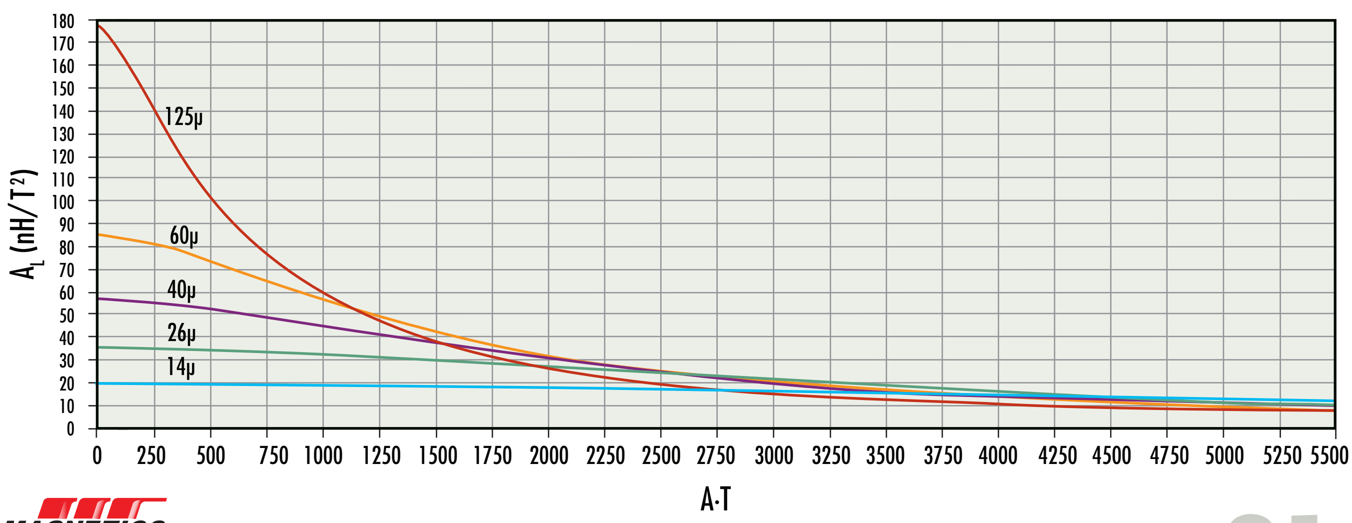
Physical Characteristics	
Window Area	1,820 mm²
Cross Section	221 mm²
Path Length	196 mm
Volume	43,400 mm³
Weight - MPP	380 g
Weight - High Flux	360 g
Weight - Kool Mμ	280 g
Weight - XFlux	320 g
Weight - Kool Mμ MAX	280 g
Area Product	403,000 mm⁴

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	64.7
20%	77.2
25%	80.5
30%	82.7
35%	86.8
40%	89.9
45%	93.1
50%	96.8
60%	104
70%	113

Wound Coil Dimensions		
40% Winding Factor	OD	86.6 mm
	HT	32.3 mm
Completely Full Window	Max OD	113 mm
	Max HT	57.7 mm

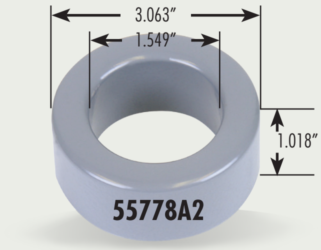
Surface Area	
Unwound Core	13,000 mm²
40% Winding Factor	24,000 mm²

Kool Mμ A_L vs. DC Bias



77.8 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	77.80 mm/3.063 in	39.34 mm/1.549 in	25.85 mm/1.018 in
After Finish (limits)	78.95 mm/3.108 in	38.34 mm/1.509 in	26.85 mm/1.057 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	47	55774	58774	77774	-	-
26	88	55775	58775	77775	78775	-
40	135	-	58776	77776	78776	-
60	205	55777	58777	77777	78777	-
125	425	55778	58778	77778	-	-

Physical Characteristics	
Window Area	1,150 mm^2
Cross Section	478 mm^2
Path Length	170 mm
Volume	81,500 mm^3
Weight - MPP	700 g
Weight - High Flux	640 g
Weight - Kool Mμ	550 g
Weight - XFLUX	550 g
Weight - Kool Mμ MAX	-
Area Product	550,000 mm^4

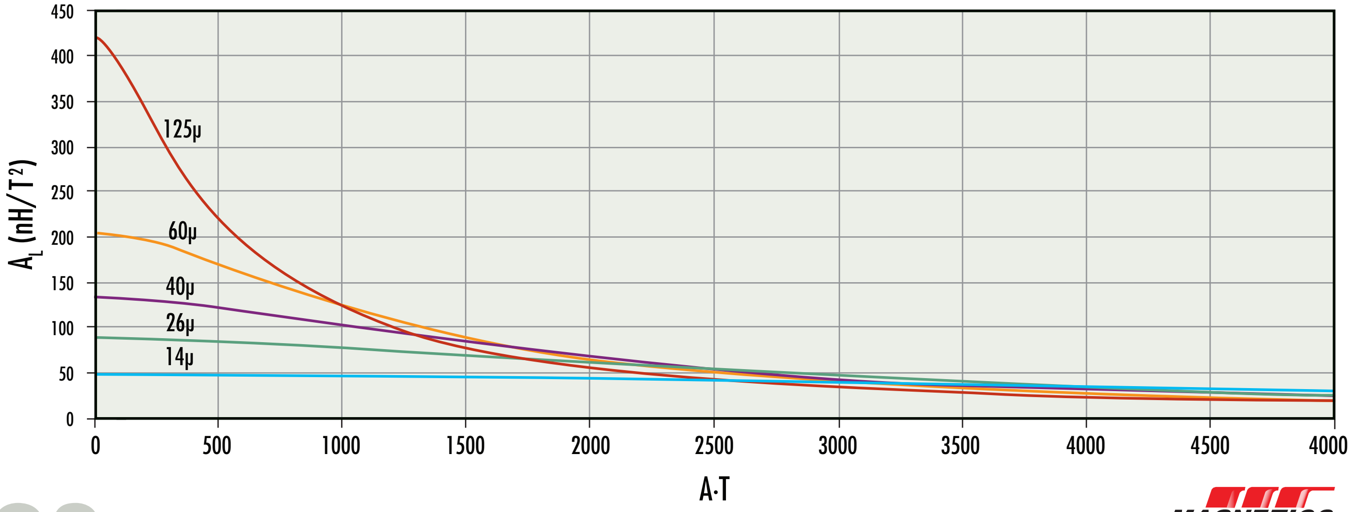
Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*

Winding Factor	Length/Turn (mm)
0%	94.3
20%	104
25%	107
30%	109
35%	112
40%	114
45%	117
50%	120
60%	126
70%	132

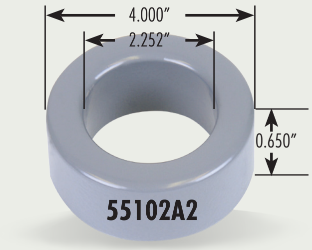
Wound Coil Dimensions		
40% Winding Factor	OD	91.0 mm
	HT	45.4 mm
Completely Full Window	Max OD	117 mm
	Max HT	69.3 mm

Surface Area	
Unwound Core	19,000 mm^2
40% Winding Factor	32,000 mm^2

Kool Mμ A_L vs. DC Bias



101.6 mm OD



Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	101.6 mm/4.000 in	57.20 mm/2.252 in	16.5 mm/0.650 in
After Finish (limits)	103.0 mm/4.055 in	55.75 mm/2.195 in	17.9 mm/0.705 in

Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	26	55101	58101	77101	-	-
26	48	55102	58102	77102	78102	79102
40	74	-	58100	77100	78100	-
60	111	55099	58099	77099	78099	79099
75	138	-	-	-	78159	-
90	167	-	-	-	78096	-
125	232	55098	-	77098	-	-

Physical Characteristics	
Window Area	2,470 mm²
Cross Section	358 mm²
Path Length	243 mm
Volume	86,900 mm³
Weight - MPP*	650 g
Weight - High Flux*	610 g
Weight - Kool Mμ*	470 g
Weight - XFLUX	620 g
Weight - Kool Mμ MAX	490 g
Area Product	885,000 mm⁴

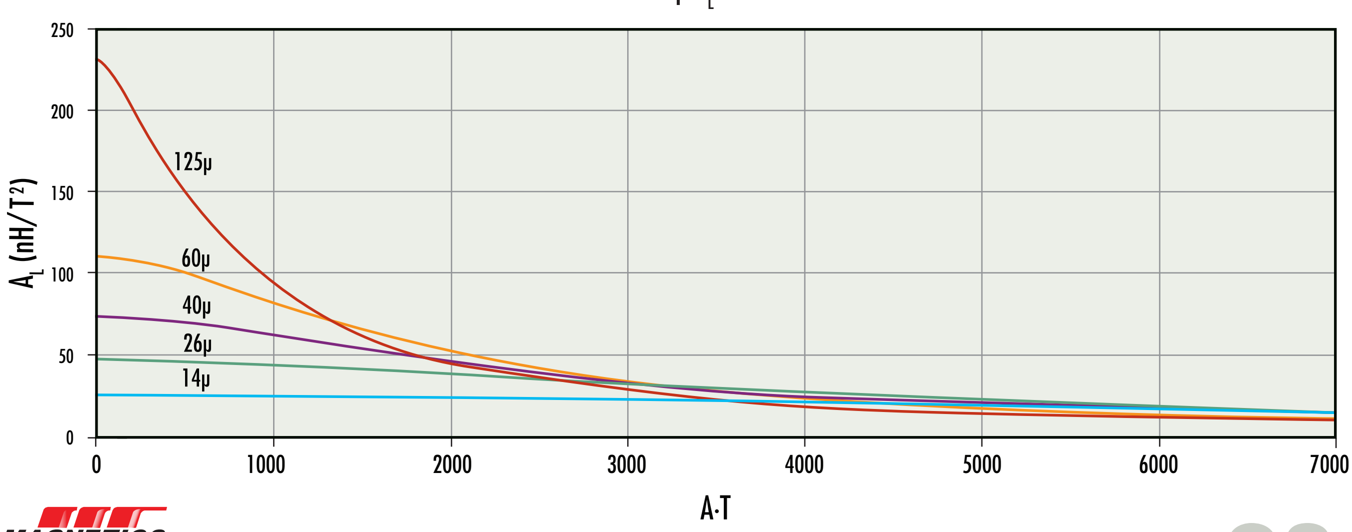
*26μ, see p.11

Winding Turn Length * Reference General Winding Data pgs. 103 - 107	
Winding Factor	Length/Turn (mm)
0%	82.2
20%	96.8
25%	100
30%	103
35%	108
40%	111
45%	116
50%	120
60%	128
70%	139

Wound Coil Dimensions		
40% Winding Factor	OD	112 mm
	HT	34.9 mm
Completely Full Window	Max OD	136 mm
	Max HT	55.1 mm

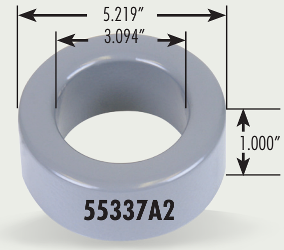
Surface Area	
Unwound Core	20,000 mm²
40% Winding Factor	36,000 mm²

Kool Mμ A_L vs. DC Bias



132.6 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	132.6 mm/5.219 in	78.60 mm/3.094 in	25.4 mm/1.000 in
After Finish (limits)	134.0 mm/5.274 in	77.19 mm/3.039 in	26.8 mm/1.055 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	37	55336	58336	77336	-	-
19	50	-	-	-	78342	-
26	68	55337	58337	77337	78337	79337
40	105	-	58338	77338	78338	-
60	158	55339	58339	77339	-	-
125	329	55340	-	-	-	-
147	380	55341	-	-	-	-

Physical Characteristics	
Window Area	4,710 mm²
Cross Section	678 mm²
Path Length	324 mm
Volume	220,000 mm³
Weight - MPP*	1,700 g
Weight - High Flux*	1,500 g
Weight - Kool Mμ*	1,200 g
Weight - XFLUX	1,400 g
Weight - Kool Mμ MAX	-
Area Product	3,190,000 mm⁴

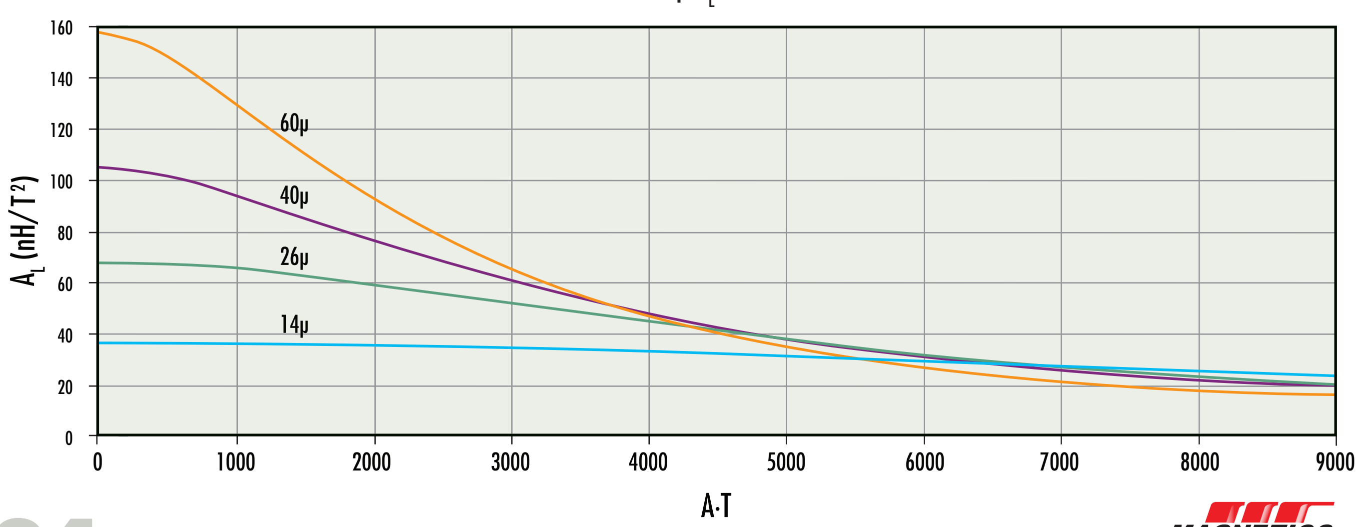
*26μ, see p. 11

Winding Turn Length * Reference General Winding Data pgs. 103 - 107	
Winding Factor	Length/Turn (mm)
0%	110
20%	130
25%	135
30%	139
35%	145
40%	150
45%	156
50%	162
60%	173
70%	187

Wound Coil Dimensions		
40% Winding Factor	OD	146 mm
	HT	50.7 mm
Completely Full Window	Max OD	179 mm
	Max HT	78.8 mm

Surface Area	
Unwound Core	36,000 mm²
40% Winding Factor	65,000 mm²

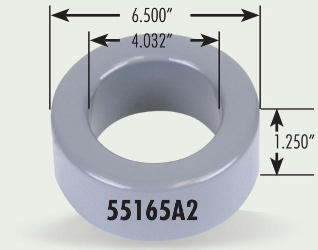
Kool Mμ A_L vs. DC Bias



MAGNETICS

165.1 mm OD

Core Dimensions	OD(max)	ID(min)	HT(max)
Before Finish (nominal)	165.1 mm/6.500 in	102.4 mm/4.032 in	31.75 mm/1.250 in
After Finish (limits)	166.5 mm/6.555 in	101.0 mm/3.977 in	33.15 mm/1.305 in



Permeability (μ)	A_L ± 8%	Part Number				
		MPP	High Flux	Kool Mμ®	XFLUX®	Kool Mμ® MAX
14	42	55164	58164	77164	-	-
26	78	55165	58165	77165	-	-
40	120	-	-	-	-	-
60	180	55167	-	-	-	-

Physical Characteristics	
Window Area	8,030 mm²
Cross Section	987 mm²
Path Length	412 mm
Volume	407,000 mm³
Weight - MPP*	3,000 g
Weight - High Flux*	2,800 g
Weight - Kool Mμ*	2,200 g
Weight - XFLUX	-
Weight - Kool Mμ MAX	-
Area Product	7,920,000 mm⁴

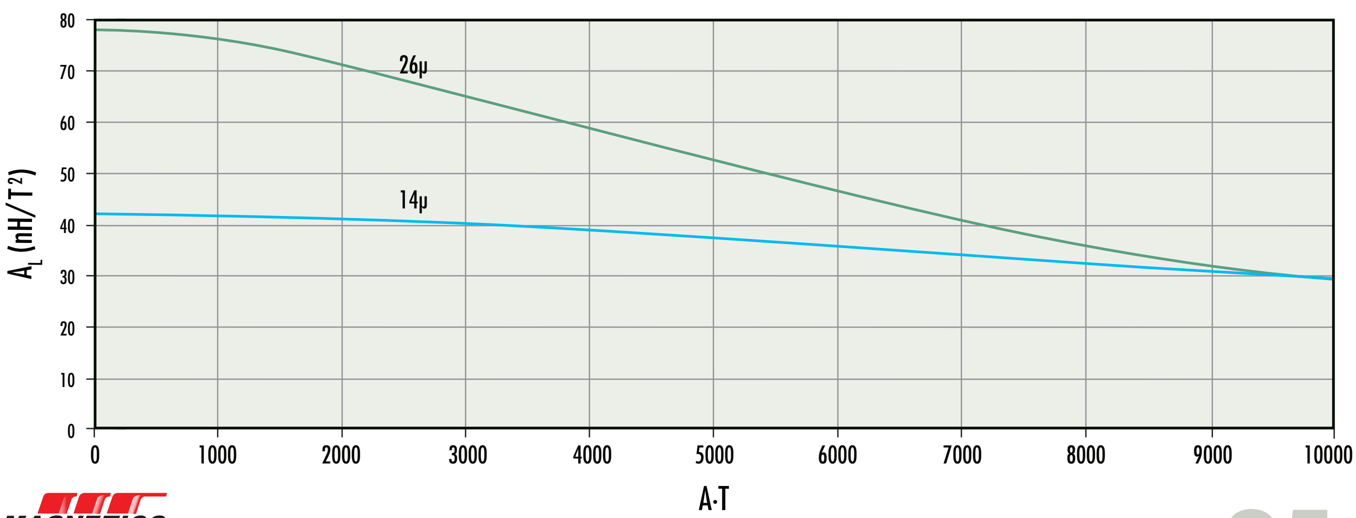
*26μ, see p.11

Winding Turn Length ** Reference General Winding Data pgs. 103 - 107*	
Winding Factor	Length/Turn (mm)
0%	132
20%	158
25%	164
30%	170
35%	178
40%	184
45%	192
50%	199
60%	215
70%	233

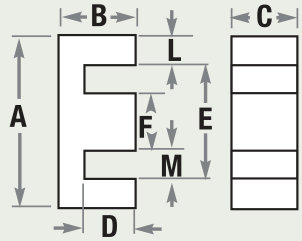
Wound Coil Dimensions		
40% Winding Factor	OD	182 mm
	HT	63.2 mm
Completely Full Window	Max OD	228 mm
	Max HT	103 mm

Surface Area	
Unwound Core	55,000 mm²
40% Winding Factor	102,000 mm²

Kool Mμ A_L vs. DC Bias



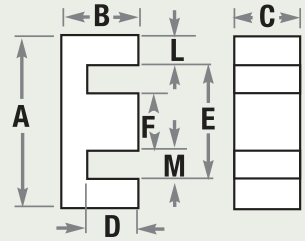
E Core Data



PART NO		A	B	C	D(min)	E(min)	F	L(nom)	M(min)
00_1808E*** (EI-187)	mm in	19.3±0.305 0.760±0.012	8.10±0.178 0.319±0.007	4.78±0.152 0.188±0.006	5.53 0.218	13.9 0.548	4.78±0.127 0.188±0.005	2.39 0.094	4.64 0.183
00_2510E*** (E-2425)	mm in	25.4±0.381 1.000±0.015	9.53±0.178 0.375±0.007	6.35±0.102 0.250±0.004	6.22 0.245	18.7 0.740	6.35±0.127 0.250±0.005	3.18 0.125	6.24 0.246
00_3007E*** (DIN 30/7)	mm in	30.10±0.457 1.185±0.018	15.0±0.229 0.591±0.009	7.06±0.152 0.278±0.006	9.55 0.376	19.8 0.782	6.96±0.203 0.274±0.008	5.11 0.201	6.32 0.249
00_3515E*** (EI-375)	mm in	34.54±0.508 1.360±0.020	14.2±0.229 0.557±0.009	9.35±0.178 0.368±0.007	9.60 0.378	25.2 0.995	9.32±0.203 0.367±0.008	4.45 0.175	7.87 0.310
00_4017E*** (EE 42/11)	mm in	42.85±0.635 1.687±0.025	21.1±0.305 0.830±0.012	10.8±0.254 0.424±0.010	14.9 0.587	30.30 1.195	11.9±0.254 0.468±0.010	5.94 0.234	9.27 0.365
00_4020E*** (DIN 42/15)	mm in	42.85±0.635 1.687±0.025	21.1±0.330 0.830±0.013	15.4±0.254 0.608±0.010	14.9 0.587	30.35 1.195	11.9±0.254 0.468±0.010	5.94 0.234	9.27 0.365
00_4022E*** (DIN 42/20)	mm in	42.85±0.635 1.687±0.025	21.1±0.330 0.830±0.013	20.0±0.254 0.788±0.010	14.9 0.587	30.35 1.195	11.9±0.254 0.468±0.010	5.94 0.234	9.27 0.365
00_4317E*** (EI-21)	mm in	40.87±0.610 1.609±0.024	16.5±0.279 0.650±0.011	12.5±0.178 0.493±0.007	10.3 0.409	28.32 1.115	12.5±0.300 0.493±0.008	6.05 0.238	7.87 0.310
00_5528E*** (DIN 55/21)	mm in	54.86±0.813 2.160±0.032	27.56±0.406 1.085±0.016	20.6±0.381 0.812±0.015	18.5 0.729	37.49 1.476	16.8±0.381 0.660±0.015	8.38 0.330	10.2 0.405
00_5530E*** (DIN 55/25)	mm in	54.86±0.813 2.160±0.032	27.56±0.406 1.085±0.016	24.6±0.381 0.969±0.015	18.5 0.729	37.49 1.476	16.8±0.381 0.660±0.015	8.38 0.330	10.2 0.405
00_6527E*** (Metric E65)	mm in	65.15±1.27 2.565±0.050	32.51±0.381 1.280±0.015	27.00±0.406 1.063±0.016	22.1 0.874	44.19 1.740	19.7±0.356 0.774±0.014	10.0 0.394	12.0 0.476
00_7228E*** (F11)	mm in	72.39±1.09 2.85±0.043	27.94±0.508 1.100±0.020	19.1±0.381 0.750±0.015	17.7 0.699	52.62 2.072	19.1±0.381 0.750±0.015	9.53 0.375	16.8 0.665
00_8020E*** (Metric E80)	mm in	80.01±1.19 3.150±0.047	38.10±0.635 1.500±0.025	19.8±0.381 0.780±0.015	28.01 1.103	59.28 2.334	19.8±0.381 0.780±0.015	9.91 0.390	19.8 0.780
00_8024E***	mm in	80.01±1.19 3.150±0.047	24.05±0.635 0.950±0.025	29.72±0.381 1.170±0.015	14.02 0.552	59.28 2.334	19.8±0.381 0.780±0.015	9.91 0.390	19.8 0.780
00_8044E***	mm in	80.01±1.19 3.150±0.047	44.58±0.635 1.755±0.025	19.8±0.381 0.780±0.015	34.36 1.353	59.28 2.334	19.8±0.381 0.780±0.015	9.91 0.390	19.8 0.780
00_114LE***	mm in	114.3±0.762 4.500±0.030	46.18±0.381 1.818±0.015	34.93±0.381 1.375±0.015	28.60 1.126	79.50 3.13	35.10±0.381 1.382±0.015	17.2 0.676	22.1 0.874
00_130LE***	mm in	130.3±3.81 5.130±0.150	32.51±0.305 1.280±0.012	53.85±1.27 2.120±0.050	22.1 0.874	108.4 4.270	20.0±0.762 0.788±0.030	10.0 0.394	44.22 1.741
00_160LE***	mm in	160.0±2.54 6.300±0.100	38.10±0.635 1.500±0.025	39.62±1.27 1.560±0.050	28.14 1.108	138.2 5.440	19.8±0.762 0.780±0.030	9.91 0.390	59.28 2.334

For material code see p. 12.
*Add permeability code*** to part number, e.g. for 26μ Kool Mμ the complete part number is 00K4022E026.*

E Core Data



PART NO	A_L nH/T² ± 8%				Path Length l_e (mm)	Cross Section A_e (mm²)	Volume V_e (mm³)
	26µ	40µ	60µ	90µ			
00_1808E***	26	35	48	69	40.1	22.8	914
00_2510E***	39	52	70	100	48.5	38.5	1,870
00_3007E***	33	46	71	92	65.6	60.1	3,940
00_3515E***	56	75	102	146	69.4	84.0	5,830
00_4017E***	56	76	105	151	98.4	128	12,600
00_4020E***	80	108	150	217	98.4	183	18,000
00_4022E***	104	140	194	281	98.4	237	23,300
00_4317E***	88	119	163	234	77.5	152	11,800
00_5528E***	116	157	219	322	123	350	43,100
00_5530E***	138	187	261	338	123	417	51,300
00_6527E***	162	230	300	-	147	540	79,400
00_7228E***	130	173	235	-	137	368	50,400
00_8020E***	103	145	190	-	185	389	72,000
00_8024E***	200	275	370	-	131.4	600	78,840
00_8044E***	91	113	170	-	208	389	80,900
00_114LE***	235	335	445	-	215	1,220	262,000
00_130LE***	254	-	-	-	219	1,080	237,000
00_160LE***	180	-	-	-	273	778	212,000

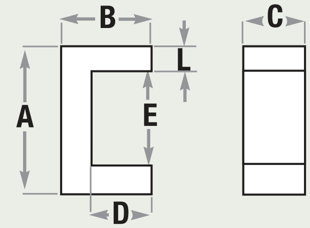
*For material code see p. 12. Add permeability code*** to part number, e.g. for 26µ Kool Mµ the complete part number is 00K4022E026.*

Blocks

PART NO		A	B	C	Volume V_e(mm³)
00_4741B***	mm in	47.50±0.61 1.870±0.024	41.00±0.51 1.614±0.020	27.51±0.41 1.083±0.016	53,600
00_5030B***	mm in	50.50±0.51 1.988±0.02	30.30±0.30 1.193±0.12	15.0±0.26 0.591±0.01	23,000
00_5528B***	mm in	54.86±0.64 2.160±0.025	27.56±0.41 1.085±0.016	20.6±0.39 0.812±0.015	31,200
00_6030B***	mm in	60.00±0.51 2.362±0.02	30.00±0.25 1.181±0.01	15.0±0.25 0.591±0.01	27,000
00_7020B***	mm in	70.5±0.51 2.776±0.020	20.3±0.25 0.799±0.010	20.0±0.25 0.787±0.010	28,600
00_7030B***	mm in	70.5±0.5 3.169±0.02	30.3±0.25 1.193±0.02	20.0±0.2 0.787±0.008	42,800
00_8030B***	mm in	80.49±0.51 3.169±0.020	30.30±0.51 1.193±0.020	20.00±0.21 0.787±0.008	48,800
00_9541B***	mm in	95.00±0.61 3.740±0.024	41.00±0.51 1.614±0.020	27.51±0.41 1.083±0.016	107,200

*For material code see p. 12. Add permeability code*** to part number, e.g. for 26µ Kool Mµ the complete part number is 00K6030B026.*
Standard blocks are available in 26µ. For other permeabilities, contact Magnetics. Note: Inductance is tested in standard picture frame arrangements.

U Core Data

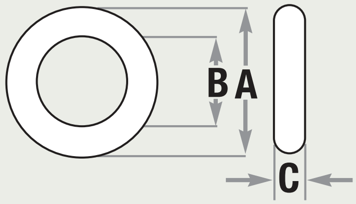


PART NO		A	B	C	D(min)	E(min)	L(nom)
00_3112U***	mm in	31.24±0.51 1.230±0.020	11.2±0.26 0.440±0.010	12.1±0.39 0.475±0.015	2.54 0.100	14.2 0.560	8.26 0.325
00_4110U***	mm in	40.64±0.51 1.600±0.020	11.2±0.51 0.440±0.020	9.53±0.39 0.375±0.015	2.54 0.100	23.6 0.930	8.38 0.330
00_4111U***	mm in	40.64±0.51 1.600±0.020	11.2±0.26 0.440±0.010	12.1±0.39 0.475±0.015	2.54 0.100	23.6 0.930	8.38 0.330
00_4119U***	mm in	40.64±0.51 1.600±0.020	11.2±0.26 0.440±0.010	19.1±0.39 0.750±0.015	2.54 0.100	23.6 0.930	8.38 0.330
00_5527U***	mm in	54.86±0.64 2.160±0.025	27.56±0.51 1.085±0.020	16.3±0.39 0.643±0.015	16.7 0.660	33.78 1.330	10.5 0.415
00_5529U***	mm in	54.86±0.64 2.160±0.025	27.56±0.51 1.085±0.020	23.2±0.39 0.912±0.015	16.5 0.650	33.02 1.300	10.5 0.415
00_6527U***	mm in	65.15±1.4 2.565±0.053	32.51±0.31 1.280±0.012	27.00±0.41 1.063±0.016	22.1 0.874	44.22 1.741	10.0 0.394
00_6533U***	mm in	65.15±1.4 2.565±0.053	32.51±0.31 1.280±0.012	20.0±0.41 0.788±0.016	19.6 0.772	39.24 1.545	12.5 0.493
00_7236U***	mm in	72.39±0.89 2.850±0.035	35.56±0.64 1.400±0.025	20.9±0.39 0.821±0.015	21.3 0.841	43.68 1.720	13.9 0.547
00_8020U***	mm in	80.01±0.89 3.150±0.035	38.10±0.64 1.500±0.025	19.8±0.39 0.780±0.015	28.14 1.108	59.28 2.334	9.91 0.390
00_8038U***	mm in	80.01±0.89 3.150±0.035	38.10±0.64 1.500±0.025	23.0±0.39 0.907±0.015	22.4 0.883	49.27 1.940	15.4 0.605

PART NO	A_L nH/T² ± 8%				Path Length l_e (mm)	Cross Section A_e (mm²)	Volume V_e (mm³)
	26µ	40µ	60µ	90µ			
00_3112U***	-	92	111	179	65.6	101	6,630
00_4110U***	-	56	78	109	85.2	80	6,820
00_4111U***	-	72	95	138	85.2	101	8,600
00_4119U***	-	110	151	218	85.2	159	13,600
00_5527U***	67	-	-	-	168	172	28,900
00_5529U***	85	-	-	-	168	244	41,000
00_6527U***	89	-	-	-	219	270	59,100
00_6533U***	82	-	-	-	199	250	49,800
00_7236U***	87	-	-	-	219	290	63,500
00_8020U***	64	-	-	-	273	195	53,200
00_8038U***	97	-	-	-	237	354	83,900

For material code *see p. 12.*
*Add permeability code*** to part number, e.g., for 26µ Kool Mµ, the complete part number is 00K6527U026.*

MPP THINZ® Core Data



THINZ are available in four permeabilities, 125µ, 160µ, 200µ, and 250µ, but the product is designed to be easily customized to any permeability up to 250. The most critical parameter of a power inductor material is its ability to provide inductance, or permeability, under DC bias. The distributed air gap of MPP results in a soft inductance versus DC bias curve.

This swinging inductance is often desirable since it maximizes power handling for a given package size; improves efficiency; accommodates a wide operating range; and provides automatic fault or overload protection.

Special core heights are available, consult Magnetics.

PART NO		A nom	B nom	C nom	A max	B min	C max
00M0301T***	mm in	3.05 0.120	1.78 0.070	0.81 0.032	3.18 0.125	1.70 0.067	0.89 0.035
00M0302T***	mm in	3.55 0.140	1.78 0.070	0.81 0.032	3.69 0.145	1.70 0.067	0.89 0.035
00M0402T***	mm in	3.94 0.155	2.23 0.088	0.81 0.032	4.07 0.160	2.13 0.084	0.89 0.035
00M0502T***	mm in	4.60 0.181	2.36 0.093	0.81 0.032	4.73 0.186	2.26 0.089	0.89 0.035
00M0603T***	mm in	6.35 0.250	2.79 0.110	0.81 0.032	6.48 0.255	2.67 0.105	0.89 0.035
00M0804T***	mm in	7.87 0.310	3.96 0.156	0.81 0.032	8.03 0.316	3.83 0.151	0.89 0.035

PART NO	A_L nH/T²± 15%				Path Length l_e (mm)	Cross Section A_e (mm²)	Volume V_e (mm³)
	125µ	160µ	200µ	250µ			
00M0301T***	8.4	10.8	13.5	16.9	7.04	0.40	2.8
00M0302T***	11.6	14.8	18.7	23.4	8.06	0.60	4.8
00M0402T***	9.6	12.3	15.4	19.3	9.44	0.58	5.5
00M0502T***	11.7	15.0	18.7	23.4	10.6	0.79	8.3
00M0603T***	14.9	19.1	24.0	30.0	13.6	1.30	17.7
00M0804T***	12.6	16.2	20.2	25.3	17.9	1.45	25.9

*Add permeability code*** to part number, e.g., for 125µ the complete part number is 00M0502T125*

E Core Hardware

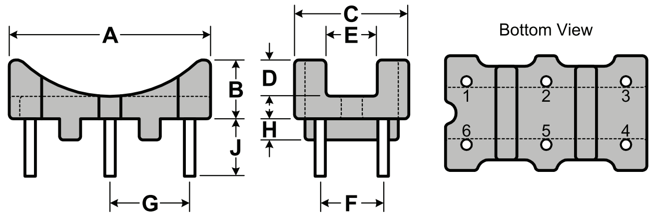
Magnetics has bobbins available for use with Kool Mμ cores. Refer to Magnetics Ferrite Cores catalog for a complete listing of available bobbins. The cores are standard industry sizes that will fit standard bobbins available from many sources. Core pieces can be assembled by bonding the mating surfaces or taping around the perimeter of the core set. Caution is advised if metal clamps are considered, since eddy current heating can occur in conductive material that is very close to the surface of low permeability powder core material.

Core Number	Bobbin Number	Number of Pins	Winding Area (mm^2)	Length Per Turn (mm)
1808E (EI-187)	PCB1808B1	8	31.6	40.5
	00B180801	-	34.2	39.4
2510E (E-2425)	PCB2510V1	10	40.6	54.2
	PCB2510V2	10	20.3	54.2
	00B251001	-	51	45.4
3007E (DIN 30/7)	PCB3007T1	10	83.3	55
3515E (EI-375)	PCB3515M1	12	94.8	73.4
	PCB3515M2	12	47.4	73.4
	00B351501	-	113	72
4020E (DIN 42/15)	PCB4020N1	12	194	91.4
	00B402021	-	207	97.5
4022E (DIN 42/20)	PCB4022N1	12	194	102.1
4317E (EI-21)	PCB4317M1	12	101	85.6
	00B4317B1	-	122	86
5528E (DIN55/25)	PCB5528WC	14	302	107.3
	00B5528B1	-	302	107.3
5530E	PCB5530FA	14	289	133.8
6527E (Metric E65)	00B6527B1	-	490	166
	00B652701	-	440	168
7228E (F11)	00B722801	-	408	149
8020E (Metric E80)	00B8020B1	-	806	165
114LE	00B114LB1	-	945	230

Toroid Hardware

TVB22066A

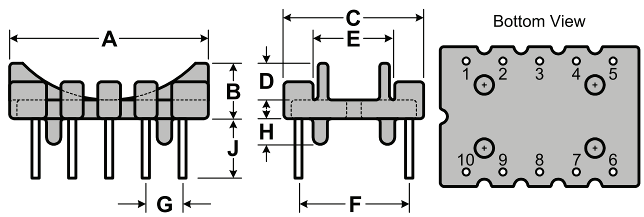
For use with toroids from
12.7 mm through 22.2 mm



Material	6 Pins	A Nom.	B Nom.	C Nom.	D Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Phenolic rated UL94V0	CP wire 0.99 mm	19.0 mm	5.44 mm	10.8 mm	3.51 mm	4.80 mm	6.00 mm	7.49 mm	2.01 mm	5.49 mm

TVB2908TA

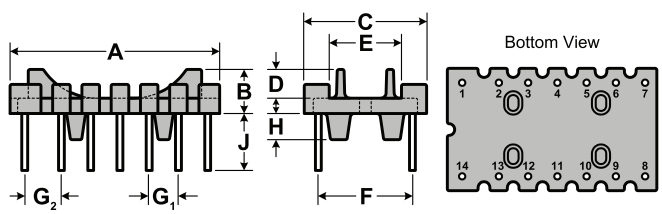
For use with toroids from
20.5 mm through 31.8 mm



Material	10 Pins	A Nom.	B Nom.	C Nom.	D Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Phenolic rated UL94V0	CP wire 0.99 mm	27.0 mm	7.49 mm	19.0 mm	5.00 mm	11.0 mm	15.0 mm	5.00 mm	3.51 mm	8.13 mm

TVB3610FA

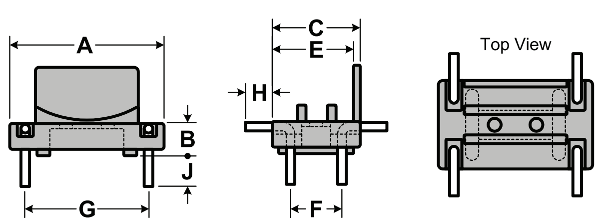
For use with toroids from
28.6 mm through 38.1 mm



Material	14 Pins	A Nom.	B Nom.	C Nom.	D Nom.	E Ref.	F Typ.	G_1 Typ.	G_2 Typ.	H Ref.	J Ref.
Phenolic rated UL94V0	CP wire 0.99 mm	35.8 mm	7.59 mm	20.8 mm	5.00 mm	12.3 mm	16.0 mm	5.00 mm	6.30 mm	4.5 mm	9.75 mm

TVH22064A

For use with toroids from
12.7 mm through 25.4 mm

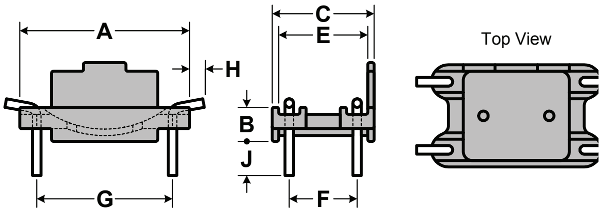


Material	4 Pins	A Nom.	B Nom.	C Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Nylon 6/6 rated UL94V0	CP wire 1.02 mm	19.1 mm	3.94 mm	10.8 mm	9.78 mm	6.35 mm	15.2 mm	3.30 mm	3.81 mm

Toroid Hardware

TVH25074A

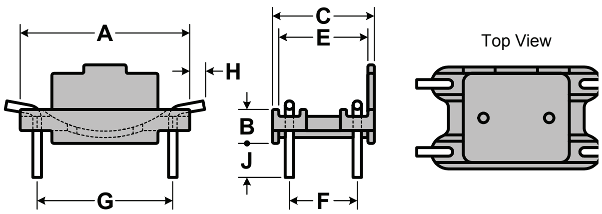
For use with toroids from 20.5 mm (0.810”) through 30.5 mm



Material	4 Pins	A Nom.	B Nom.	C Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Nylon 6/6 rated UL94V0	CP wire 1.21 mm	25.4 mm	5.08 mm	15.2 mm	13.0 mm	10.2 mm	20.3 mm	2.29 mm	5.08 mm

TVH38134A

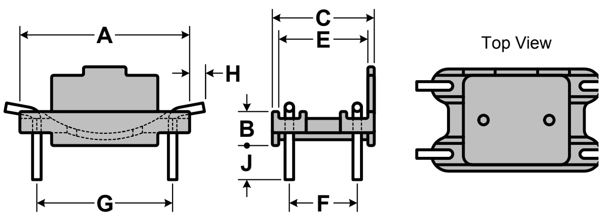
For use with toroids from 25.4 mm (1.000”) through 40.6 mm



Material	4 Pins	A Nom.	B Nom.	C Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Nylon 6/6 rated UL94V0	CP wire 1.27 mm	27.9 mm	5.08 mm	20.3 mm	18.0 mm	15.2 mm	22.9 mm	2.29 mm	5.08 mm

TVH49164A

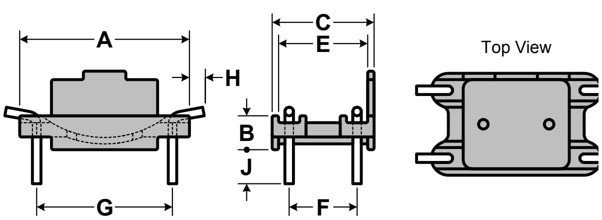
For use with toroids from 38.1 mm through 63.5 mm



Material	4 Pins	A Nom.	B Nom.	C Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Nylon 6/6 rated UL94V0	CP wire 1.27 mm	35.6 mm	5.08 mm	22.9 mm	20.6 mm	17.8 mm	30.5 mm	2.29 mm	5.08 mm

TVH61134A

For use with toroids from 44.4 mm through 71.1 mm



Material	4 Pins	A Nom.	B Nom.	C Nom.	E Ref.	F Typ.	G Typ.	H Ref.	J Ref.
Nylon 6/6 rated UL94V0	CP wire 1.27 mm	43.2 mm	5.08 mm	27.9 mm	25.7 mm	22.9 mm	38.1 mm	2.29 mm	5.08 mm

Winding Tables

3.56 mm OD (140 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
30	10	0.0286
31	11	0.0392
32	13	0.0567
33	15	0.0821
34	17	0.119
35	20	0.172
36	23	0.246
37	25	0.328
38	28	0.461
39	33	0.704
40	38	1.03
41	43	1.42
42	49	2.01
43	55	2.91
44	59	3.76
45	69	5.65
46	76	7.80
47	85	11.0
48	98	16.0
49	109	22.2

6.35 mm OD (020 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
26	12	0.0216
27	14	0.0312
28	16	0.0446
29	18	0.0617
30	21	0.0910
31	23	0.125
32	26	0.173
33	30	0.252
34	34	0.367
35	39	0.518
36	44	0.729
37	48	0.977
38	54	1.39
39	62	2.07
40	71	3.00
41	80	4.13
42	91	5.87
43	101	8.40
44	110	11.1
45	128	16.6

6.86 mm OD (410 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
22	12	0.0116
23	14	0.0168
24	16	0.0239
25	18	0.0334
26	20	0.0465
27	23	0.0663
28	26	0.0942
29	29	0.129
30	33	0.187
31	37	0.262
32	41	0.358
33	47	0.518
34	53	0.752
35	60	1.05
36	67	1.47
37	74	1.99
38	83	2.82
39	96	4.24
40	109	6.11
41	122	8.37

3.94 mm OD (150 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
28	11	0.0251
29	13	0.0364
30	15	0.0529
31	17	0.0749
32	19	0.103
33	22	0.149
34	25	0.218
35	28	0.300
36	32	0.427
37	35	0.574
38	40	0.826
39	46	1.23
40	53	1.80
41	59	2.44
42	68	3.52
43	76	5.06
44	82	6.60
45	96	9.93
46	105	13.6
47	117	19.1

6.60 mm OD (240 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
26	11	0.0196
27	13	0.0287
28	15	0.0414
29	17	0.0577
30	19	0.0815
31	22	0.118
32	25	0.165
33	28	0.233
34	32	0.342
35	36	0.473
36	41	0.672
37	45	0.907
38	51	1.30
39	58	1.92
40	67	2.80
41	75	3.84
42	85	5.43
43	95	7.82
44	103	10.3
45	121	15.5

7.87 mm OD (030 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
22	12	0.00988
23	14	0.0142
24	16	0.0201
25	18	0.0281
26	20	0.0390
27	23	0.0556
28	26	0.0787
29	29	0.108
30	33	0.156
31	37	0.218
32	41	0.298
33	47	0.430
34	53	0.623
35	60	0.870
36	67	1.21
37	74	1.65
38	83	2.33
39	96	3.50
40	109	5.04
41	122	6.90

4.65 mm OD (180 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
27	11	0.0212
28	12	0.0289
29	14	0.0414
30	16	0.0597
31	18	0.0838
32	20	0.114
33	23	0.165
34	27	0.249
35	31	0.352
36	34	0.481
37	38	0.661
38	43	0.942
39	50	1.42
40	57	2.05
41	64	2.82
42	73	4.01
43	81	5.73
44	88	7.52
45	103	11.3
46	113	15.6

6.60 mm OD (270 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
26	11	0.0266
27	13	0.0390
28	15	0.0566
29	17	0.0790
30	19	0.112
31	22	0.163
32	25	0.228
33	28	0.322
34	32	0.474
35	36	0.658
36	41	0.936
37	45	1.26
38	51	1.81
39	58	2.68
40	67	3.92
41	75	5.37
42	85	7.61
43	95	11.0
44	103	14.4
45	121	21.8

9.65 mm OD (280 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
20	12	0.00684
21	13	0.00914
22	15	0.0131
23	18	0.0194
24	20	0.0268
25	23	0.0383
26	26	0.0541
27	29	0.0747
28	33	0.107
29	37	0.147
30	42	0.212
31	47	0.297
32	52	0.404
33	58	0.568
34	67	0.844
35	75	1.17
36	84	1.63
37	92	2.19
38	104	3.13
39	119	4.66

Winding Tables

9.65 mm OD (290 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
20	12	0.00747
21	13	0.0100
22	15	0.0144
23	18	0.0213
24	20	0.0295
25	23	0.0421
26	26	0.0596
27	29	0.0825
28	33	0.118
29	37	0.163
30	42	0.234
31	47	0.328
32	52	0.448
33	58	0.630
34	67	0.937
35	75	1.29
36	84	1.81
37	92	2.44
38	104	3.48
39	119	5.18

10.2 mm OD (040 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
20	13	0.00818
21	15	0.0117
22	17	0.0165
23	19	0.0227
24	22	0.0328
25	25	0.0463
26	28	0.0650
27	31	0.0893
28	36	0.130
29	40	0.178
30	45	0.254
31	50	0.354
32	56	0.488
33	63	0.693
34	72	1.02
35	81	1.42
36	91	1.99
37	99	2.66
38	112	3.80
39	128	5.65

11.2 mm OD (130 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
16	10	0.00272
17	11	0.00366
18	13	0.00532
19	15	0.00756
20	17	0.0106
21	20	0.0153
22	23	0.0220
23	25	0.0295
24	29	0.0426
25	33	0.0602
26	37	0.0845
27	41	0.116
28	46	0.164
29	52	0.228
30	59	0.328
31	65	0.453
32	72	0.618
33	81	0.877
34	93	1.30
35	104	1.79

12.7 mm OD (050 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
16	12	0.00364
17	14	0.00520
18	16	0.00733
19	19	0.0107
20	21	0.0147
21	24	0.0207
22	28	0.0302
23	31	0.0413
24	35	0.0582
25	40	0.0829
26	45	0.117
27	50	0.161
28	56	0.227
29	63	0.315
30	71	0.451
31	79	0.629
32	87	0.854
33	98	1.21
34	112	1.79
35	125	2.46

16.5 mm OD (120 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
13	12	0.00234
14	14	0.00336
15	16	0.00471
16	18	0.00654
17	21	0.00940
18	24	0.0133
19	27	0.0185
20	30	0.0255
21	34	0.0359
22	39	0.0516
23	44	0.0722
24	49	0.101
25	56	0.143
26	63	0.203
27	70	0.280
28	78	0.393
29	87	0.542
30	98	0.775
31	108	1.07
32	121	1.48

17.3 mm OD (380 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
13	11	0.00223
14	13	0.00324
15	15	0.00460
16	17	0.00644
17	20	0.00933
18	22	0.0127
19	25	0.0179
20	29	0.0258
21	32	0.0354
22	37	0.0512
23	41	0.0704
24	46	0.099
25	52	0.139
26	59	0.199
27	66	0.277
28	74	0.391
29	82	0.535
30	92	0.764
31	102	1.06
32	114	1.47

20.3 mm OD (206 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
11	12	0.00163
12	14	0.00232
13	16	0.00324
14	18	0.00449
15	21	0.00644
16	24	0.00909
17	27	0.0126
18	31	0.0179
19	35	0.0251
20	39	0.0347
21	45	0.0498
22	50	0.0692
23	56	0.0962
24	63	0.135
25	71	0.191
26	80	0.270
27	89	0.374
28	100	0.529
29	111	0.725
30	125	1.04

22.9 mm OD (310 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
10	12	0.00148
11	14	0.00212
12	16	0.00296
13	18	0.00409
14	21	0.00589
15	24	0.00830
16	27	0.0116
17	31	0.0164
18	35	0.0230
19	39	0.0319
20	44	0.0446
21	50	0.0632
22	56	0.0888
23	63	0.124
24	70	0.173
25	79	0.244
26	89	0.345
27	99	0.479
28	111	0.677
29	123	0.927

23.6 mm OD (350 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
9	11	0.00120
10	13	0.00173
11	15	0.00244
12	17	0.00340
13	19	0.00467
14	22	0.00668
15	25	0.00938
16	28	0.0130
17	32	0.0184
18	36	0.0258
19	41	0.0365
20	46	0.0510
21	51	0.0705
22	58	0.101
23	65	0.140
24	73	0.197
25	82	0.277
26	92	0.392
27	102	0.542
28	115	0.770

Winding Tables

26.9 mm OD (930 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
9	11	0.00141
10	13	0.00205
11	15	0.00292
12	17	0.00407
13	20	0.00592
14	22	0.00808
15	25	0.0114
16	29	0.0164
17	33	0.0232
18	37	0.0324
19	42	0.0459
20	47	0.0640
21	53	0.0902
22	60	0.128
23	66	0.176
24	75	0.251
25	84	0.352
26	94	0.497
27	105	0.693
28	117	0.975

33.0 mm OD (548 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	14	0.00147
9	17	0.00218
10	19	0.00299
11	22	0.00427
12	25	0.00598
13	28	0.00826
14	32	0.0117
15	36	0.0163
16	41	0.0232
17	46	0.0322
18	52	0.0455
19	58	0.0632
20	65	0.0883
21	74	0.126
22	83	0.177
23	92	0.245
24	103	0.344
25	116	0.485
26	131	0.691
27	145	0.954

34.3 mm OD (585 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	17	0.00160
9	20	0.00229
10	23	0.00323
11	26	0.00449
12	30	0.00636
13	34	0.00887
14	38	0.0123
15	43	0.0172
16	48	0.0238
17	54	0.0332
18	61	0.0467
19	69	0.0657
20	77	0.0913
21	87	0.1287
22	98	0.1821
23	109	0.2519
24	122	0.354
25	137	0.497
26	153	0.699
27	170	0.969

35.8 mm OD (324 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	16	0.00169
9	19	0.00246
10	22	0.00351
11	25	0.00491
12	28	0.00677
13	32	0.00955
14	36	0.0133
15	41	0.0188
16	46	0.0263
17	52	0.0369
18	58	0.0514
19	65	0.0718
20	73	0.1
21	82	0.141
22	93	0.201
23	103	0.277
24	116	0.392
25	130	0.551
26	146	0.78
27	162	1.08

39.9 mm OD (254 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	18	0.00229
9	21	0.00329
10	24	0.00464
11	27	0.00646
12	31	0.00917
13	35	0.0128
14	39	0.0178
15	44	0.0250
16	50	0.0354
17	56	0.0493
18	63	0.0695
19	71	0.0978
20	80	0.138
21	90	0.194
22	101	0.274
23	112	0.379
24	126	0.536
25	141	0.753
26	158	1.06
27	175	1.47

46.7 mm OD (438 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	18	0.00280
9	21	0.00405
10	24	0.00573
11	27	0.00801
12	31	0.0114
13	35	0.0160
14	39	0.0223
15	44	0.0314
16	50	0.0446
17	56	0.0622
18	63	0.0878
19	71	0.124
20	80	0.175
21	90	0.246
22	101	0.349
23	112	0.483
24	126	0.683
25	141	0.961
26	158	1.36
27	175	1.88

46.7 mm OD (089 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	22	0.00296
9	26	0.00432
10	29	0.00596
11	33	0.00840
12	38	0.0120
13	42	0.0164
14	47	0.0229
15	54	0.0327
16	60	0.0455
17	68	0.0641
18	76	0.0897
19	86	0.127
20	96	0.177
21	108	0.249
22	121	0.352
23	135	0.490
24	151	0.690
25	170	0.975
26	190	1.37
27	211	1.91

50.5 mm OD (725 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	19	0.0033
9	22	0.0047
10	25	0.0067
11	28	0.0093
12	32	0.0132
13	36	0.0185
14	40	0.026
15	46	0.037
16	51	0.051
17	58	0.073
18	65	0.102
19	73	0.144
20	82	0.202
21	92	0.28
22	104	0.41
23	116	0.57
24	130	0.80
25	146	1.13
26	163	1.59
27	181	2.21

50.8 mm OD (715 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	25	0.00324
9	29	0.00463
10	33	0.00651
11	37	0.00904
12	42	0.0127
13	47	0.0176
14	53	0.0247
15	60	0.0348
16	67	0.0486
17	76	0.0685
18	85	0.0959
19	95	0.134
20	107	0.189
21	120	0.265
22	135	0.375
23	150	0.520
24	168	0.732
25	189	1.03
26	211	1.46
27	234	2.02

Winding Tables

57.2 mm OD (195 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	20	0.00322
9	23	0.00458
10	26	0.00642
11	30	0.00921
12	34	0.0130
13	39	0.0185
14	43	0.0254
15	49	0.0362
16	55	0.0508
17	62	0.0714
18	70	0.101
19	78	0.141
20	88	0.199
21	99	0.281
22	111	0.398
23	124	0.555
24	138	0.777
25	156	1.10
26	174	1.56
27	193	2.16

68.0 mm OD (070 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	22	0.0027
7	25	0.0038
8	29	0.0054
9	33	0.0077
10	37	0.0107
11	42	0.0151
12	48	0.022
13	54	0.030
14	60	0.042
15	68	0.059
16	76	0.083
17	85	0.116
18	96	0.165
19	108	0.23
20	120	0.32
21	135	0.46
22	152	0.65
23	169	0.90
24	189	1.27
25	212	1.79

77.8 mm OD (906 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	41	0.00660
9	47	0.00937
10	53	0.0131
11	60	0.0184
12	67	0.0256
13	76	0.0361
14	85	0.0504
15	95	0.0703
16	107	0.0991
17	120	0.139
18	135	0.195
19	151	0.274
20	169	0.383
21	189	0.538
22	212	0.761
23	236	1.06
24	264	1.49
25	296	2.10
26	331	2.96
27	367	4.11

57.2 mm OD (109 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	29	0.00397
9	33	0.00558
10	37	0.00773
11	42	0.0109
12	48	0.0154
13	54	0.0215
14	60	0.0297
15	68	0.0420
16	76	0.0586
17	85	0.0816
18	96	0.115
19	108	0.162
20	120	0.225
21	135	0.318
22	152	0.451
23	169	0.625
24	189	0.880
25	212	1.24
26	238	1.76
27	263	2.43

74.1 mm OD (740 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	29	0.00450
7	33	0.00632
8	38	0.00907
9	43	0.0128
10	49	0.0182
11	55	0.0255
12	62	0.0358
13	70	0.0505
14	78	0.0706
15	88	0.0997
16	98	0.139
17	110	0.196
18	124	0.277
19	139	0.390
20	155	0.546
21	174	0.769
22	195	1.09
23	217	1.52
24	243	2.14
25	273	3.03

77.8 mm OD (778 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	32	0.0071
9	37	0.0102
10	41	0.0141
11	47	0.0202
12	53	0.0284
13	60	0.0401
14	67	0.056
15	75	0.079
16	84	0.111
17	95	0.156
18	106	0.219
19	119	0.309
20	133	0.432
21	150	0.61
22	168	0.87
23	187	1.21
24	209	1.70
25	235	2.40
26	263	3.40
27	291	4.71

62.0 mm OD (620 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	20	0.00260
7	23	0.00368
8	26	0.00517
9	30	0.00741
10	34	0.0104
11	38	0.0146
12	43	0.0205
13	49	0.0291
14	54	0.0402
15	61	0.0568
16	69	0.0805
17	78	0.114
18	87	0.159
19	98	0.225
20	110	0.316
21	123	0.444
22	138	0.629
23	154	0.878
24	172	1.24
25	194	1.75

77.8 mm OD (866 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
8	41	0.00607
9	47	0.00860
10	53	0.0120
11	60	0.0169
12	67	0.0234
13	76	0.0329
14	85	0.0459
15	95	0.0640
16	107	0.0901
17	120	0.126
18	135	0.178
19	151	0.248
20	169	0.348
21	189	0.487
22	212	0.689
23	236	0.958
24	264	1.35
25	296	1.90
26	331	2.68
27	367	3.72

101.6 mm OD (102 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	38	0.00489
7	43	0.00682
8	49	0.00965
9	55	0.0135
10	62	0.0189
11	70	0.0266
12	79	0.0373
13	89	0.0524
14	99	0.0730
15	112	0.103
16	125	0.145
17	140	0.202
18	157	0.285
19	176	0.400
20	197	0.561
21	221	0.790
22	248	1.12
23	275	1.55
24	308	2.19
25	345	3.09

Winding Tables

132.6 mm OD (337 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	54	0.00890
7	61	0.0124
8	69	0.0175
9	78	0.0247
10	87	0.0344
11	99	0.0489
12	111	0.0685
13	124	0.0956
14	138	0.133
15	155	0.188
16	174	0.265
17	195	0.371
18	218	0.522
19	244	0.733
20	273	1.03
21	306	1.45
22	343	2.05
23	381	2.85
24	426	4.02
25	478	5.68

165.1 mm OD (165 size)

AWG Wire Size	Single Layer Turns	Single Layer R_{DC} (Ohms, Ω)
6	72	0.0139
7	81	0.0193
8	91	0.0272
9	103	0.0384
10	115	0.0536
11	130	0.0759
12	145	0.106
13	163	0.149
14	182	0.209
15	204	0.293
16	228	0.412
17	256	0.579
18	286	0.814
19	320	1.14
20	358	1.61
21	401	2.26
22	449	3.21
23	499	4.46
24	558	6.29
25	625	8.86

Other Products from Magnetics

Ferrites

Magnetics' ferrite cores are manufactured for a wide variety of applications. Magnetics produces the leading MnZn ferrite materials for power transformers, power inductors, wideband transformers, common mode chokes, and many other applications. In addition to offering the leading materials, other advantages of ferrites from Magnetics include the full range of standard planar E, ER, and I cores; the widest range of toroid sizes in power and high permeability materials; standard gapping to precise inductance or mechanical dimension; a wide range of available coil formers and assembly hardware; and superior toroid coatings available in several options.

Power Materials

Five low loss materials are engineered for optimum frequency and temperature performance in power applications. Magnetics' R, P, F, L, and T materials provide superior saturation, high temperature performance, low losses and product consistency.

Shapes: E cores, Planar E cores, ER cores, ETD, EC, U cores, I cores, PQ, Planar PQ, RM, Toroids, Pot cores, RS (round-slab), DS (double slab), EP, Special Shapes.

Applications: Telecom power supplies, computer power supplies, commercial power supplies, consumer power supplies, automotive, DC-DC converters, telecom data interfaces, impedance matching transformers, handheld devices, high power control (gate drive), computer servers, distributed power (DC-DC), EMI filters, aerospace, and medical.

High Permeability Materials

Three high permeability materials (5,000µ J material, 10,000µ W material, and 15,000µ M material) are engineered for optimum frequency and impedance performance in signal, choke and filter applications. These Magnetics materials provide superior loss factor, frequency response, temperature performance, and product consistency.

Shapes: Toroids, E cores, U cores, RM, Pot cores, RS (round-slab), DS (double slab), EP, Special Shapes.

Applications: common mode chokes, EMI filters, other filters, pulse transformers, current transformers, broadband transformers, current sensors, telecom data interfaces, impedance matching interfaces, handheld devices, spike suppression, and gate drive transformers.

Tape Wound Cores

Magnetics strip wound cores are made from high permeability magnetic strip alloys of nickel-iron (80% or 50% nickel), and silicon-iron. The alloys are know as Orthonol®, Permalloy 80, 48 Alloy and Magnesil®. Tape Wound Cores are produced as small as 0.438" OD in hundreds of sizes. For a wide range of frequency applications, materials are produced in thicknesses from 1/2 mil (0.013 mm) through 4 mils (0.102 mm). Cases are robust nylon and aluminum boxes, rated for 200°C continuous operation and 2,000 minimum voltage breakdown.

Applications: aerospace applications, radar installations, jet engine controls, power supplies, current transformers and other high reliability applications.

Bobbin Cores

Magnetics bobbin cores are miniature tape cores made from ultra-thin (0.000125" to 0.001" thick) strip material wound on nonmagnetic stainless steel bobbins. Bobbin Cores are generally manufactured from Permalloy 80 and Orthonol®. Covered with protective caps and then epoxy coated, Bobbin Cores can be made as small as 0.05" ID and with strip widths down to 0.032". Bobbin Cores can switch from positive to negative saturation in a few microseconds or less, making them ideal for analog logic elements, magnetometers, and pulse transformers.

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