Soft Magnetic Metal Powder Cores

FERRITE DOMEN Co. is the long - time leading company which performs R&D and manufacture of all classes and types of soft magnetic and microwave ferrites.
Besides, it also deals with the cores produced on the base of metal powders of

- **Molybdenum Permalloy (MPP cores) Maximum Flux Density 0.8 T**
- **Permalloy 50% Ni (High Flux cores) Maximum Flux Density 1.5 T**

Generally, initial powders are the grains of corresponding metal with their individual insulation, so the cores of those materials have the structure of distributed air gap what in the case of ferrites is provided by slitting the cores or grinding the central part (leg) of E-type and RM-type cores.
The metal powder cores have some important features used effectively in communication and electrotechnic power circuits:

- High specific resistance
- Low hysteresis losses
- High saturation flux density
- Excellent stability of induction in AC and DC
- High long-term stability of parameters
- Polyamide 11 (Rilsan) 100% coating against voltage breakdown of 4 kV to 8 kV, according to specific orders.

Symbols

μ_i	- Initial permeability
f	- Operational frequency
f_c	- Critical frequency
$tg\delta_\mu$	- Relative loss factor
H_m	- External magnetic field
$TK\mu_i$	- Temperature coefficient of initial permeability
A_L	- Inductance factor

Molybdenum Permalloy Powder cores (MPP)
80% Ni, 3% Mo

Molybdenum Permalloy Powder cores (MPP) find the wide application in electronic and electrical circuits where high Q-value of inductances and long-term stability of parameters are the critical factors. They effectively show their attractive features as energy storage chokes in AC-DC, DC-DC and DC-AC convertors, as electronic ballasts in energy saving light lamps, as inductive elements of various filters etc.

Material Grade	μ_i	F	$tg\delta_\mu$ ($x10^{-3}$)			$TK_{\mu i}$ ($x10^{-6}$) 1/°C	
	± 10%	kHz	F_c, kHz	H_a =24 A/m	H_a =72 A/m	(-60 + 85) °C	(-60 +155) °C
MP 14	12...14	5000	1000	—	20.0	—	120
			3000	—	50.0		
MP 20	20	1000	1000	—	30.0	120	—
MP 60	60	30	30	—	5.9	100	120
			100	12.0	12.9		
MP 100	100	30	30	—	10.3	100	120
			100	22.8	24.3		
MP 125	125	100	30	—	18.0	120	150
			100	45.0	48.0		
MP 140	140	100	30	—	20.0	120	150
			100	48.5	51.5		
MP 160	160	100	30	—	37.5	150	180
			100	105.0	108.0		
MP 250	250	30	30	45.0	50.0	200	250

High Flux cores

High Flux cores are based on permalloy material with 50% Ni compared with 81% Ni for molypermalloy.
They feature high saturation flux density of 15.000 G vs. 7.000 G for MPP cores and are ideal for in-line filters and for pulse chokes where they demonstrate high energy storage.

Material Grade	μ_i	F	$tg\delta_\mu$ ($x10^{-3}$)		$TK_{\mu i}$ ($x10^{-6}$) 1/°C
	± 10%	kHz	F_c, kHz	H_a =72 A/m	(-60 + 100) °C
IP 14	14	3000	1000	20	150
IP 60	60	300	30	7	200
			100	15	
IP 125	125	100	30	20	200
			100	51	
IP 147	147	100	30	30	200
			100	80	
IP 160	160	50	10	40	250
			30	100	

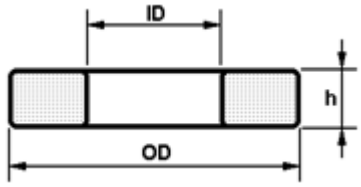
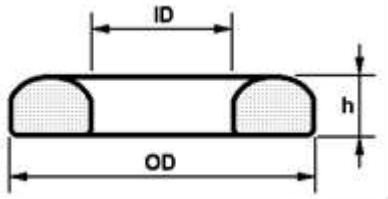
Inductance Factor A_L (nH/N^2) of MPP Cores

Core Shape	Material Grade							
	MP14	MP20	MP60	MP100	MP125	MP140	MP160	MP250
SK10x6x3	2.86-4.52	5.0-6.4	16.2-19.8	27.0-33.0	33.8-41.3	37.8-46.2	43.2-52.8	67.5-82.5
SK10x6x4.5	4.54-6.78	7.7-9.8	24.3-29.7	40.5-49.5	50.7-61.9	56.7-69.3	64.8-79.2	101.3-123.8
SK12x5x5.5	10.08-13.59	14.9-20.7	49.0-59.8	81.5-99.6	101.9-124.5	114.1-139.5	130.4-159.4	203.8-249.1
SK13x7x5	6.45-9.0	10.5-13.5	32.4-39.6	54.0-66.0	67.5-82.5	75.6-92.4	86.4-105.6	135.0-165.0
SK17x10x6.5	7.42-10.13	10.5-15.1	36.5-44.6	60.8-74.4	76.0-92.8	81.5-104.0	97.3-118.9	152.0-185.8
SK20x12x6.5	7.17-9.75	11.3-15.0	35.1-42.9	58.5-71.5	73.2-89.4	81.9-100.1	93.6-114.4	146.3-178.8
SP15x7x4.8	7.02-9.53	10.9-14.6	34.3-41.9	57.2-69.9	71.6-87.4	80.1-97.9	91.5-111.9	143.0-174.8
SP15x7x6.7	10.32-13.68	15.6-21.0	49.2-60.2	82.1-100.3	102.6-125.4	114.9-140.4	131.3-160.5	205.2-250.8
SP19x11x4.8	4.98-6.99	8.1-11.5	25.2-30.8	41.9-51.3	52.2-64.1	58.8-71.8	67.1-82.1	104.9-128.2
SP19x11x6.7	7.31-10.03	11.7-15.1	36.0-44.1	60.2-73.6	75.3-92.0	84.2-103.0	96.3-117.7	150.5-183.9
SP24x13x5.2	6.01-8.21	9.5-12.5	29.5-36.0	49.2-60.2	61.6-75.2	68.9-84.2	78.8-96.3	123.1-150.4
SP24x13x7	8.54-11.42	13.3-17.3	41.1-50.3	68.5-83.7	85.6-104.6	95.9-117.2	109.6-134.0	171.3-209.3
SP27x15x5.2	5.66-7.81	9.1-11.8	28.1-34.4	46.9-57.3	58.6-71.6	65.6-80.2	74.9-91.6	117.1-143.1
SP27x15x6	6.74-9.18	10.7-13.9	36.0-44.0	60.0-73.4	75.0-91.6	84.0-102.6	96.0-117.4	150.0-183.4
SP36x25x7.5	5.42-7.48	8.8-11.1	26.9-32.9	44.8-54.8	56.0-68.4	62.7-76.7	71.6-87.6	112.0-136.9
SP36x25x9.7	7.24-9.85	11.7-14.6	35.5-43.4	59.1-72.2	73.8-90.2	82.7-101.1	94.5-115.5	147.6-180.4
SP44x28x7.2	6.27-8.45	9.9-12.6	30.4-37.2	50.7-62.0	63.4-77.4	71.0-86.8	81.1-99.1	126.7-154.9
SP44x28x10.3	9.51-12.59	14.8-18.8	45.3-55.3	75.4-92.2	94.2-115.2	105.6-129.0	120.6-147.4	188.5-230.3
SP52x36x10	7.4-9.97	11.7-14.9	35.9-43.9	59.9-73.1	74.8-91.4	83.8-102.4	98.5-117.0	149.6-182.8
SP52x36x14	10.63-14.33	16.5-20.9	51.6-63.1	85.9-105.1	107.5-131.0	120.4-147.2	135.5-168.1	215.0-262.8

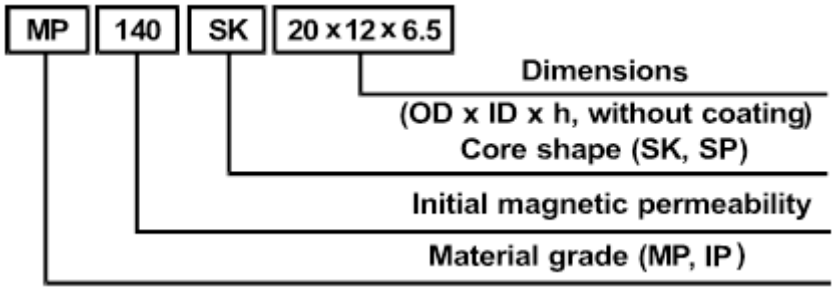
Inductance Factor A_L (nH/N^2) of High Flux cores

Core Shape	Material Grade				
	IP14	IP60	IP125	IP147	IP160
SK10x6x3	2.86-4.52	12.7-17.3	25.9-38.4	30.5-45.2	33.2-49.2
SK10x6x4.5	4.54-6.78	20.4-27.9	41.5-62.0	48.8-73.0	53.2-79.4
SK12x5x5.5	10.08-13.59	43.2-59.1	88.1-131.0	103.6-154.0	112.8-168.4
SK13x7x5	6.45-9.0	29.0-40.0	56.8-89.5	66.6-105.5	72.5-115.0
SK17x10x6.5	7.42-10.13	32.9-45.1	64.8-98.4	76.2-115.7	83.0-126.0
SK20x12x6.5	7.17-9.75	31.8-43.6	62.5-94.5	73.5-111.1	80.0-121.0
SP15x7x4.8	7.02-9.53	32.0-44.0	61.8-92.2	72.6-108.5	79.1-118.1
SP15x7x6.7	10.32-13.68	46.0-62.0	90.1-134.0	106.0-158.0	115.4-172.4
SP19x11x4.8	4.98-6.99	22.0-31.0	45.5-68.0	53.5-68.0	58.3-87.1
SP19x11x6.7	7.31-10.03	33.0-44.0	66.8-99.7	78.6-117.0	85.6-127.8
SP24x13x5.2	6.01-8.21	27.0-38.0	53.7-80.0	63.2-94.2	68.8-102.6
SP24x13x7	8.54-11.42	38.0-51.0	77.0-115.0	90.7-135.0	98.8-147.6
SP27x15x5.2	5.66-7.81	26.0-36.0	51.0-76.2	60.0-89.6	65.3-97.6
SP27x15x6	6.74-9.18	30.0-41.1	61.2-91.2	71.9-107.0	78.3-116.9
SP36x25x7.5	5.42-7.48	24.0-33.0	49.6-74.0	58.3-87.0	63.5-94.8
SP36x25x9.7	7.24-9.85	33.0-43.3	66.0-98.5	77.5-115.0	84.4-126.1
SP44x28x7.2	6.27-8.45	28.0-38.0	55.7-83.0	65.5-97.7	71.3-106.5
SP44x28x10.3	9.51-12.59	43.0-56.0	85.0-129.0	100.0-152.0	109.0-165.6
SP52x36x10	7.4-9.95	32.8-44.9	71.2-95.0	84.0-111.7	91.2-121.6
SP52x36x14	10.63-14.33	47.2-64.6	101.2-137.5	119.0-161.0	129.7-176.3

Dimensions of Toroid Cores

Core Shape		Dimensions, mm					
		without coating			coated		
		OD	ID	h	OD, max	ID, min	h, max
SK - type 	SK10x6x3	10	6	3	10.8	5.50	4.1
	SK10x6x4.5	10	6	4.5	10.8	5.50	5.6
	SK12x5x5.5	12	5	5.5	12.8	4.50	6.6
	SK13x7x5	13	7	5	13.8	6.56	6.1
	SK17x10x6.5	17	10	6.5	17.8	9.56	7.6
	SK20x12x6.5	20	12	6.5	20.8	11.63	7.6
SP - type 	SP15x7x4.8	15	7	4.8	15.8	6.56	5.9
	SP15x7x6.7	15	7	6.7	15.8	6.56	7.8
	SP19x11x4.8	19	11	4.8	19.8	10.53	5.9
	SP19x11x6.7	19	11	6.7	19.8	10.53	7.8
	SP24x13x5.2	24	13	5.2	24.8	12.63	6.3
	SP24x13x7	24	13	7.0	24.8	12.63	8.1
	SP27x15x5.2	27	15	5.2	27.8	14.52	6.3
	SP27x15x6	27	15	6	27.8	14.52	6.8
	SP36x25x7.5	36	25	7.5	—	—	—
	SP36x25x9.7	36	25	9.7	—	—	—
	SP44x28x7.2	44	28	7.2	—	—	—
	SP44x28x10.3	44	28	10.3	—	—	—
	SP52x36x10	52	36	10	—	—	—
	SP52x36x14	52	36	14	—	—	—

Part Number Example



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