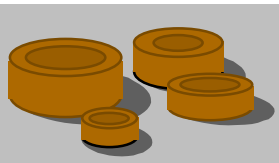
nanocrystalline VITROPERM 500F

Toroidal Cores for Common Mode Chokes and EMC applications



For noise attenuation in applications like SMPS, welding units or inverters, tape-wound cores made of nanocrystalline VITROPERM 500 F offer significant advantages in volume and performance. The benefits come from the unique combination of material properties, like high initial permeabiltiy, high permeability levels (μ ≈ 30 000 and 80 000) over a wide frequency range combined with high saturation flux density and low core losses. For a common mode choke the following advantages can be achieved:

- high inductance at a low coupling capacity and low DC - losses.
- high insertion attenuation over a wide frequency range.
- smallest size.

Core informations:

Cores are inserted in plastic cases and fixed with silicon rubber (Fix 022) to achieve the best magnetic properties and optimal protection and is suitable for direct winding.
UL - file numbers / flame - classes:
E 41613 / UL 94 HB
E 41817 / UL 94 V0
E 66640 / UL 94 V0

Material data of VITROPERM 500F (typical values):

Saturation flux density	1.2 T
Saturation magnetostriction	< 0.5 ppm
Specific electrical resistance	1.15 Ω mm^2/m
Core losses (100 kHz, at B = 0.3 T)	< 100 W/kg
Curie temperature	600 °C
Upper temperature limit (continuous operation)	120 °C
Permeability μ_3 (at 10 kHz)	30 000 / 80 000

VITROPERM 500F tape-wound cores for common mode chokes, standard sizes:

core dimensions	finished dimensions (limiting values)			effective core cross-section	mean core path length	AL - value (single - turn inductance)	thermal resistance	part number, order code
	O.D.	I.D.	H	A_{Fe}	l_{Fe}	A_L (10 kHz)	R_{th}	
	mm	mm	mm	cm^2	cm	μH	K/W	T6000...
12.5×10×5	14.0	8.5	6.7	0.050	3.53	7.5 - 14.5	55	**6-L2012-W498**
16×10×6	17.8	8.6	8.0	0.140	4.10	32.0 - 60.0 9.6 - 17.0	40	**6-L2016-W403** **6-L2016-W308**
17.5×12.6×6	19.0	11.0	8.0	0.118	4.73	22.5 - 42.2	35	**6-L2017-W515**
20×12.5×8	22.5	10.4	10.1	0.240	5.10	43.0 - 80.0 8.9 - 20.7	26	**6-L2020-W409** **6-L2020-W450**
25×20×10	27.6	17.4	12.8	0.200	7.07	21.3 - 41.2	26	**6-L2025-W523**
25×16×10	27.8	13.7	12.7	0.360	6.44	50.0 - 95.0 10.5 - 24.6	26	**6-L2025-W380** **6-L2025-W451**
30×20×10	32.7	17.7	12.5	0.400	7.85	46.0 - 86.0 12.5 - 22.5	13	**6-L2030-W423** **6-L2030-W358**
40×32×15	43.1	28.7	18.5	0.456	11.3	36.5 - 68.4 7.6 - 17.7	11	**6-L2040-W422** **6-L2040-W452**
40×25×15	43.1	22.5	18.5	0.855	10.2	76.0 - 142.0 15.8 - 36.8	11	**6-L2040-W424** **6-L2040-W453**
50×40×20	53.5	36.3	23.4	0.760	14.1	34.0 -65.7	7	**6-L2050-W516**
63×50×25	67.3	46.5	28.6	1.240	17.8	44.0 - 85.0	5	**6-L2063-W517**
80×50×20	86.0	44.7	25.7	2.280	20.4	26.3 - 51.0	4	**6-L2080-W531**
90×60×20	95.4	56.1	24.7	2.280	23.6	61.0 - 118	4	**6-L2090-W518**
102×76×25	108.1	70.0	30.3	2.470	28.0	≥ 55.0	3	**6-L2102-W468**

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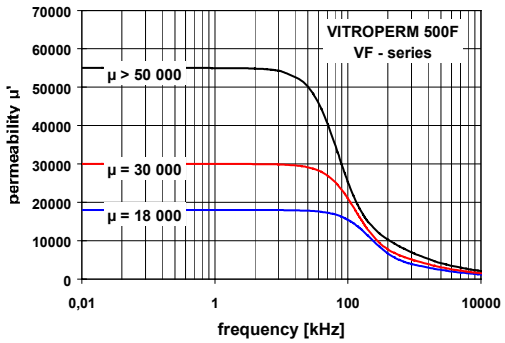
nanocrystalline VITROPERM 500 F

Toroidal Cores for Common Mode Chokes and EMC applications

VF - Series

„VF“ is our synonym for a new series of **volume-optimized** and **frequency-improved** cores for Common-Mode Chokes and all other kind of EMC applications. They are designated to meet the steadily increasing requirements of the EMC market:

- The latest improvements of our innovative nanocrystalline core material VITROPERM 500 F assure excellent high - frequency attenuation and low losses. In addition to the conventional 10 kHz – measurement, the A_L – value of the VF - cores is specified and tested at f = 100 kHz.
- All cores offer a particular large inner diameter allowing high numbers of turns to achieve a high inductance and a high current - handling capability at the same time. Superb damping results can be achieved by using a low - capacitive geometry of the windings. All listed core items are finished with epoxy coating (Fix 350, Fix 351).
- VF - cores are available with a medium permeability of 30 000, depending on the core size additionally also with permeability levels of 18 000 or over 50 000 .
- Our highly automatized manufacturing process enables an attractive pricing for the VF - series.



Material data VITROPERM 500 F (VF-Series)	typical values
Saturation flux density	1.2 T
Saturation magnetostriction	< 0.5 ppm
Specific electrical resistance	1.15 Ω mm²/m
Core losses (100 kHz, 0.3 T)	< 100 W/kg
Curie temperature	600 °C
Upper temperature limit (continuous operation)	120 °C
Permeability μ_3 (at f = 10 kHz)	a) ~ 18 000 b) ~ 30 000 c) > 50 000

Tape-wound cores of VITROPERM 500 F („VF“ - series), standard sizes:

core dimensions	finished dimensions (limiting values)			core cross section	mean core path length	AL - value (single - turn inductance)	AL – value (single - turn inductance)		part number, order code
	O.D.	I.D.	H	A_{Fe}	l_{Fe}	A_L (10 kHz)	A_L (100 kHz)	R_{th}	
mm	mm	mm	mm	cm²	cm	μH	μH	K/W	T6000...
16×12.5×6	17.8	10.7	8.0	0.08	4.5	4.5 - 8.7 11.2 - 21.7	2.91 - 5.62 3.58 - 6.92	40	**4-L2016-W619**[b] **4-L2016-W620**[c]
25×20×10	27.3	17.5	12.3	0.19	7.1	6.76 - 13.07 16.9 - 32.7	4.39 - 8.48 5.4 - 10.4	26	**4-L2025-W621**[b] **4-L2025-W622**[c]
30×25×15	32.3	22.7	17.5	0.27	8.6	5.14 - 9.95 19.8 - 38.5	3.87 - 7.49 6.37 - 12.3	13	**4-L2030-W675**[a] **4-L2030-W676**[c]
40×32×15	42.3	29.1	17.8	0.44	11.3	9.7 - 18.8 24.3 - 47.1	6.3 - 12.2 7.8 - 15.0	11	**4-L2040-W623**[b] **4-L2040-W624**[c]
50×40×20	52.3	37.1	22.8	0.73	14.1	8.37 - 16.2 13.0 - 25.1 32.4 - 62.7	7.5 - 14.6 8.4 - 16.3 10.4 - 20.0	7	**4-L2050-W583**[a] **4-L2050-W625**[b] **4-L2050-W626**[c]
63×50×20	65.6	46.6	22.8	0.95	17.8	8.67 - 16.8 13.4 - 26.0	7.8 - 15.1 8.7 - 16.9	5	**4-L2063-W721**[a] **4-L2063-W627**[b]
80×63×20	83.0	59.5	22.8	1.24	22.5	8.96 - 17.4 13.9 - 26.9	8.05 - 15.6 9.0 - 17.4	4	**4-L2080-W722**[a] **4-L2080-W628**[b]
100×80×20	104.0	75.0	23.0	1.46	28.3	8.4 - 16.2 13.0 - 25.1	7.5 - 14.6 8.4 - 16.3	3	**4-L2100-W723**[a] **4-L2100-W629**[b]
130×100×25	134.5	95.0	28.5	2.74	36.1	12.3 - 23.8 19.0 - 36.8	11.0 - 21.4 12.4 - 23.9	2	**4-L2130-W587**[a] **4-L2130-W630**[b]
160×130×25	165.0	125.0	28.5	2.74	45.6	9.7 - 18.9 15.1 - 29.2	8.8 - 17.0 9.8 - 19.0	2	**4-L2160-W720**[a] **4-L2160-W631**[b]

We recommend additional isolation between core and windings for enhanced isolation requirements.

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