

USHA AMORPHOUS METALS LIMITED

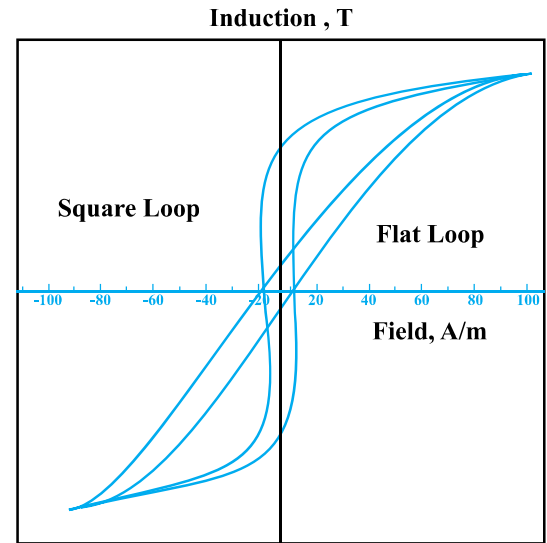
Fe-Based Nanocrystalline Toroidals Cores

APPLICATIONS

- ▶ Common mode chokes used in EMC / EMI filters for SMPS and inverter drives
- ▶ Transformer Cores for high frequency Switched mode power supplies
- ▶ Electrical welding power sources
- ▶ X-ray generators
- ▶ Battery chargers
- ▶ Solar generators
- ▶ Sensor Cores
- ▶ AC-to-DC or DC-to-DC converters
- ▶ Cores used in Power supplies in the automotive industry
- ▶ Cores for saturable reactors, magnetic amplifiers, beads, and pulse compressors
- ▶ Railway Transportation Systems
- ▶ Electronic Watt-Hour Meters
- ▶ Transformer cores for Earth leakage circuit breakers (ground fault interrupters).



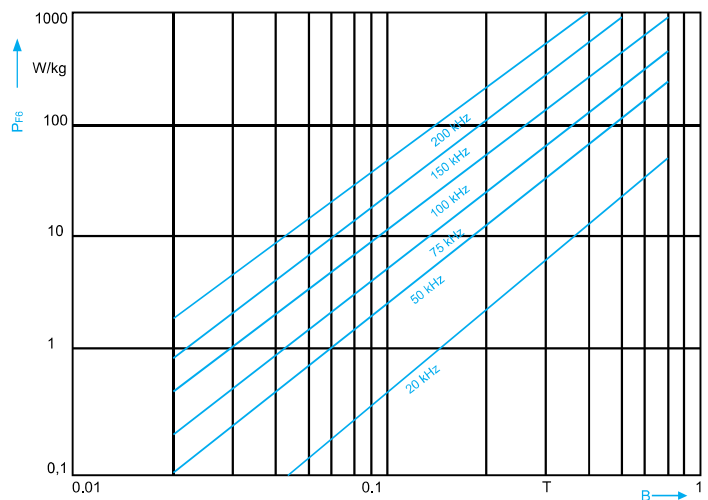
TYPICAL HYSTERESIS LOOP CURVE



BENEFITS

- ▶ Significantly smaller build volume (up to more than a factor of 3)
- ▶ Satisfy both high saturation magnetic flux density and high permeability long with low coercivity.
- ▶ Makes the single stage filter designs possible.
- ▶ Low core loss (approximately 1/5th of the Fe based amorphous metal).
- ▶ Low magnetostriction, thus less affected by mechanical stress.
- ▶ Low number of turns required for high L, thus reducing number of filter stages.
- ▶ High efficiency, hence low power loss and hence less use of material makes it eco friendly.
- ▶ Very low audible noise emission.
- ▶ Less copper losses due to reduced number of turns.
- ▶ Aging effects are very small Unlike Co-based amorphous metals.
- ▶ Epoxy coated fiber glass tape/ casing is resistant against mechanical stress.
- ▶ Excellent high frequency characteristics as the values of permeability and core losses remain high and low respectively at very wide range of frequencies.
- ▶ Extended temperature range from -25°C ... $+120^{\circ}\text{C}$ (standard) / 180°C (special) due to high curie temperature, thus making material properties nearly independent of temperature.

CORE LOSS vs. FLUX DENSITY



MAGNETIC PROPERTIES

Material Grade	UMNT-V	UMNT-A
Initial Permeability	$>3 \times 10^4$	$>1 \times 10^4$
Maximum Permeability	$>8 \times 10^4$	$>6 \times 10^4$
Coercitivity	$<3 \text{ A/m}$	$>1.6 \text{ A/m}$
Core Loss (100Khz, 0.3T)	$<80 \text{ W/kg}$	$>150 \text{ W/kg}$

PHYSICAL PROPERTIES

Material	UMNT-V	UMNT-A	Material	UMNT-V	UMNT-A
Saturation flux Density	1.20T	1.25T	Saturation magnetostriction	$<1 \times 10^{-6}$	$<2.7 \times 10^{-6}$
Curie Temperature	570°C	570°C	Density	7.35 g/cm^3	7.25 g/cm^3
Crystallization Temperature	500°C	510°C	Resistivity	$115^{\circ} \mu\text{-ohm-cm}$	$130^{\circ} \mu\text{-ohm-cm}$
Hardness Hv	800 kg/mm^2	880 kg/mm^2	Continuous Upper Operation Temperature	130°C	130°C

STANDARD CORE SIZE TABLE & ORDERING INFORMATION

PRODUCT MADE BY NANOCRYSTALLINE MATERIAL

Part No.	Bare dimensions (mm)			with Reinforcement dimensions (mm)			Im* (cm)	Ac* (cm ²)	Wa* (cm ²)	Mfe* (g)	AL (μH)±30%
	OD	ID	Height	OD	ID	Height					
UMNT-A0131005	12.50	9.50	5.00	14.50	7.50	6.80	3.46	.06	.71	1.4	5.45
UMNT-A0201308	20.10	12.70	8.00	22.00	10.70	9.80	5.15	.22	1.27	8.3	14.44
UMNT-A0201310	20.10	12.70	10.00	22.50	10.20	12.30	5.14	.28	1.27	10.3	18.05
UMNT-A0261910	25.60	19.10	10.00	28.10	16.60	12.30	7.02	.25	2.87	12.6	11.63
UMNT-A0252015	25.00	20.00	15.00	27.60	17.40	17.40	7.07	.29	3.14	14.6	16.00
UMNT-A0302010	30.00	20.00	10.00	33.00	17.20	12.40	7.85	.38	3.14	21.6	19.20
UMNT-A0402520	40.00	25.00	20.00	43.40	21.60	23.20	10.21	1.14	4.91	84.4	44.31
UMNT-A0504020	50.00	40.00	20.00	53.40	36.60	23.70	14.14	.76	12.57	77.9	21.33
UMNT-A0645025	64.00	50.00	25.00	67.40	46.60	28.20	17.91	1.33	19.63	172.7	29.47
UMNT-A0645030	64.00	50.00	30.00	67.40	46.60	33.20	17.91	1.60	19.63	207.2	35.37
UMNT-A0755030	75.00	50.00	30.00	78.40	46.60	33.20	19.63	2.85	19.63	405.7	57.60
UMNT-A0805030	80.00	50.00	30.00	83.40	46.60	33.20	20.42	3.42	19.63	506.3	66.46
UMNT-A0906030	90.00	60.00	30.00	93.40	56.60	33.20	23.56	3.42	28.27	584.2	57.6
UMNT-A1008030	100.0	80.00	30.00	103.40	76.60	33.20	28.27	2.28	50.27	467.4	32.00

PRODUCT MADE BY VAC MATERIAL

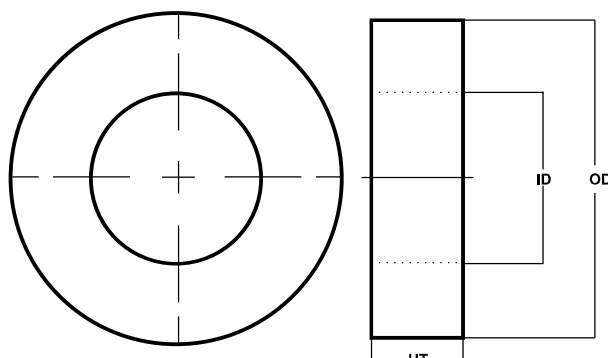
Part No.	Bare dimensions (mm)			with Reinforcement dimensions (mm)			Im* (cm)	Ac* (cm ²)	Wa* (cm ²)	Mfe* (g)	AL (μH)±30%
	OD	ID	Height	OD	ID	Height					
UMNT-V0131005	12.50	9.50	5.00	14.50	7.50	6.80	3.46	.06	.71	1.5	12.00
UMNT-V0201308	20.00	12.70	8.00	22.00	10.70	9.80	5.14	.22	1.27	8.4	31.43
UMNT-V0201310	20.00	12.70	10.00	22.50	10.20	12.30	5.14	.28	1.27	10.5	39.19
UMNT-V0261910	25.60	19.10	10.00	28.10	16.60	12.30	7.02	.25	2.87	12.8	27.92
UMNT-V0252015	25.00	20.00	15.00	27.60	17.40	17.40	7.07	.29	3.14	14.9	32.0
UMNT-V0251620	25.00	16.00	20.00	28.00	13.20	22.80	6.44	.68	2.01	32.6	84.29
UMNT-V0252020	25.00	20.00	20.00	28.00	17.20	22.80	7.07	.38	3.14	19.9	92.67
UMNT-V0302010	30.00	20.00	10.00	33.00	17.20	12.80	7.80	.38	3.14	22.1	38.40
UMNT-V0402520	40.00	25.00	20.00	43.40	21.60	23.20	10.21	1.14	4.91	86.1	88.62
UMNT-V0504020	50.00	40.00	20.00	53.40	36.60	23.20	14.14	.76	12.57	79.5	42.67
UMNT-V0504025	50.00	40.00	25.00	53.40	36.60	28.20	14.14	.95	12.57	99.4	53.33
UMNT-V0645025	64.00	50.00	25.00	67.40	46.60	28.20	17.91	1.33	19.63	176.2	58.95
UMNT-V0645030	64.00	50.00	30.00	67.40	46.60	33.20	17.91	1.60	19.63	211.5	70.74
UMNT-V0755030	75.00	50.00	30.00	78.40	46.60	33.20	19.63	2.85	19.63	414.4	115.2
UMNT-V0805030	80.00	50.00	30.00	83.40	46.60	33.20	20.42	3.42	19.63	516.8	132.92
UMNT-V0906030	90.00	60.00	30.00	93.40	56.60	33.20	23.56	3.42	28.27	596.3	115.2
UMNT-V1008020	100.0	80.00	20.00	103.40	76.60	23.20	28.27	1.52	50.27	318.0	64.00

*REFERENCE VALUE ONLY
CUSTOM SIZES ALSO AVAILABLE

PRODUCT IDENTIFICATION

UMNT XAAABBCC

Where
 UM : UAML Magnetics
 N : Nano crystalline
 T : Toroidal
 X : Material Grade
 AAA : Outer Dimension without casing
 BB : Inner Dimension without casing
 CC : Height Dimension without casing



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