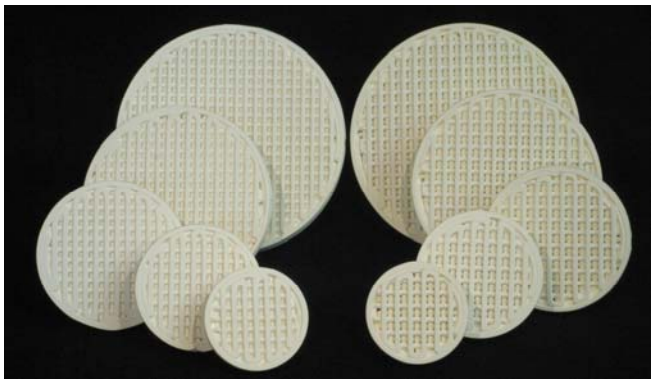
MULLITE *LATTICE FILTER*™

ROBOCASTING

DATA SHEET

Mullite lattice filters are both an engineered lattice structure suitable for molten metal filtration applications and an alternative to conventional ceramic filters. The repeating internal geometry of the lattice filter allows for precise control of flow rate and liquid-metal turbulence while maintaining the inclusion and dross filtration found in conventional ceramic filters. Thermal shock resistance of mullite ceramics is extremely high, but mullite can be reactive in certain metal systems including iron, steel, and some superalloys.



High-purity mullite lattices are available in a range of sizes and internal lattice configurations (see sizing table) for many metals and thermal situations. Standard product sizes are 50–125mm (2–5 inches) in two grades of filtration with four flow rates per grade. Custom sizes, grade, and flow rates are also available.

FILTRATION ADVANCEMENT

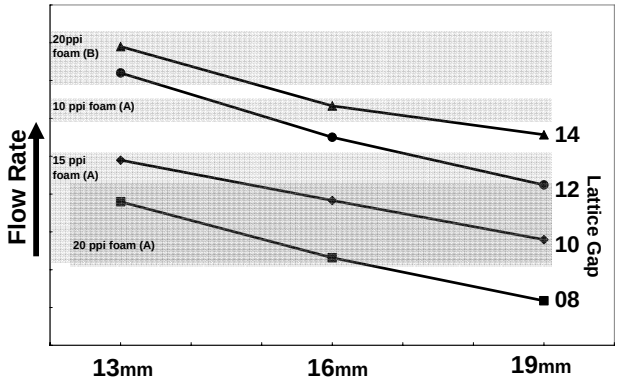
Consistency: Lattice filters are an engineered structure with repeatable cell size and orientation. As a result, flow rates are nearly identical (within 3%) between each filter. Further, filter efficiency is the same throughout the lattice with no areas of varying cell size or openness of porosity.

Efficiency: The liquid-metal flow is perfectly split as it passes through each layer of the lattice resulting in high filtration efficiency.

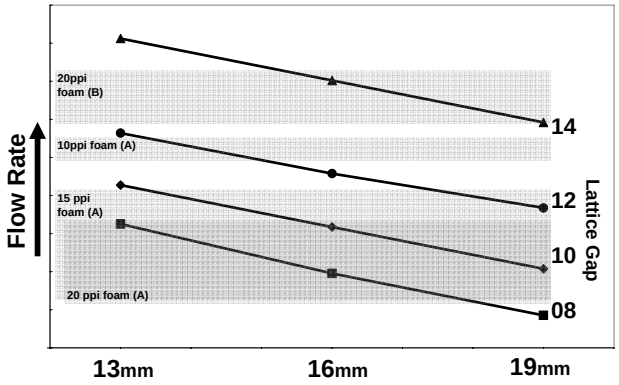
Strength: Filter friability is minimized due to the robust nature of the structure. The layerwise-manufacturing technique used to fabricate the lattices results in a strong, cohesive filtration product with no weak areas within the filter.

Capacity: Superior strength results in an increased liquid-metal-filtration capacity. Due to differences in liquid-metal cleanliness in different applications, capacities may vary.

Flow Rates: Lattice rod size and gap are controllable to very tight tolerances within the lattice resulting in consistent flow rates.



"Fine" *LATTICE FILTER*™ thickness



"Coarse" *LATTICE FILTER*™ thickness

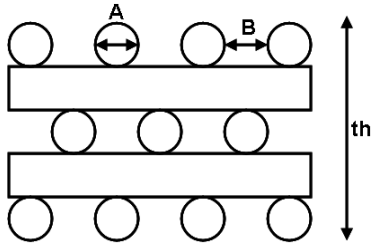
Patent: US PATENT No. 6027326

REV001

LATTICE FILTER

sizing table

Product ID[1]	Filter Diam. (±2 mm)	Rod	Rod Diam. A (±0.1 mm)	Flow	Gap B (±0.15 mm)	Gap:Rod Ratio (x10)	Surface Area (mm^2)		
							TH=13.0 mm	TH=16.0 mm	TH=19.0 mm
50-TH-F-08-M	50.0	Fine	1.7	Slow	1.4	8	26,300	32,500	38,000
50-TH-F-10-M	50.0	Fine	1.7	Average	1.7	10	23,900	29,200	34,500
50-TH-F-12-M	50.0	Fine	1.7	Fast	2.0	12	21,900	26,800	31,700
50-TH-F-14-M	50.0	Fine	1.7	V. Fast	2.4	14	20,000	24,500	28,900
50-TH-C-08-M	50.0	Coarse	2.6	Slow	2.1	8	12,600	17,700	20,100
50-TH-C-10-M	50.0	Coarse	2.6	Average	2.6	10	12,000	16,700	19,200
50-TH-C-12-M	50.0	Coarse	2.6	Fast	3.1	12	10,700	15,000	17,100
50-TH-C-14-M	50.0	Coarse	2.6	V. Fast	3.6	14	10,100	14,100	16,100
62.5-TH-F-08-M	62.5	Fine	1.7	Slow	1.4	8	43,800	53,500	63,200
62.5-TH-F-10-M	62.5	Fine	1.7	Average	1.7	10	38,900	47,500	56,100
62.5-TH-F-12-M	62.5	Fine	1.7	Fast	2.0	12	36,000	44,000	51,900
62.5-TH-F-14-M	62.5	Fine	1.7	V. Fast	2.4	14	33,300	40,700	48,100
62.5-TH-C-08-M	62.5	Coarse	2.6	Slow	2.1	8	26,500	30,800	35,100
62.5-TH-C-10-M	62.5	Coarse	2.6	Average	2.6	10	24,000	27,800	31,700
62.5-TH-C-12-M	62.5	Coarse	2.6	Fast	3.1	12	21,800	25,300	28,800
62.5-TH-C-14-M	62.5	Coarse	2.6	V. Fast	3.6	14	19,700	22,800	25,900
75-TH-F-08-M	75.0	Fine	1.7	Slow	1.4	8	65,700	72,800	94,800
75-TH-F-10-M	75.0	Fine	1.7	Average	1.7	10	58,900	65,200	85,000
75-TH-F-12-M	75.0	Fine	1.7	Fast	2.0	12	54,600	60,700	79,000
75-TH-F-14-M	75.0	Fine	1.7	V. Fast	2.4	14	49,900	55,300	71,800
75-TH-C-08-M	75.0	Coarse	2.6	Slow	2.1	8	33,800	47,100	53,900
75-TH-C-10-M	75.0	Coarse	2.6	Average	2.6	10	29,900	42,000	47,900
75-TH-C-12-M	75.0	Coarse	2.6	Fast	3.1	12	27,300	38,400	43,700
75-TH-C-14-M	75.0	Coarse	2.6	V. Fast	3.6	14	24,700	34,700	39,500
100-TH-F-08-M	100.0	Fine	1.7	Slow	1.4	8	122,400	149,600	176,800
100-TH-F-10-M	100.0	Fine	1.7	Average	1.7	10	109,400	133,700	158,000
100-TH-F-12-M	100.0	Fine	1.7	Fast	2.0	12	100,800	123,300	145,700
100-TH-F-14-M	100.0	Fine	1.7	V. Fast	2.4	14	92,900	113,500	134,200
100-TH-C-08-M	100.0	Coarse	2.6	Slow	2.1	8	76,300	89,100	102,000
100-TH-C-10-M	100.0	Coarse	2.6	Average	2.6	10	69,200	80,600	92,000
100-TH-C-12-M	100.0	Coarse	2.6	Fast	3.1	12	63,500	74,200	85,000
100-TH-C-14-M	100.0	Coarse	2.6	V. Fast	3.6	14	57,200	66,600	75,900
125-TH-F-08-M	125.0	Fine	1.7	Slow	1.4	8	196,400	240,200	283,800
125-TH-F-10-M	125.0	Fine	1.7	Average	1.7	10	175,300	214,300	253,300
125-TH-F-12-M	125.0	Fine	1.7	Fast	2.0	12	159,900	196,900	232,700
125-TH-F-14-M	125.0	Fine	1.7	V. Fast	2.4	14	149,300	182,500	215,600
125-TH-C-08-M	125.0	Coarse	2.6	Slow	2.1	8	124,100	144,600	165,100
125-TH-C-10-M	125.0	Coarse	2.6	Average	2.6	10	112,100	131,000	149,800
125-TH-C-12-M	125.0	Coarse	2.6	Fast	3.1	12	102,500	119,700	137,000
125-TH-C-14-M	125.0	Coarse	2.6	V. Fast	3.6	14	93,100	108,400	123,700



[1] thickness values (filter height) are: TH = 13.0, 16.0, or 19.0 mm (±0.5 mm)

Robocasting Enterprises, LLC
5660 Pino AVE NE
Albuquerque, NM 87109
505-883-0555