



## SKAMOL VIP-12 HS

Structural Insulation - specially developed for the Steel Industry

### Description

The VIP-12 HS is a vermiculite-based insulating board for tough environments. The board has a maximum service temperature of 1150°C (2102°F) and has very good thermal conductivity characteristics. This combined with the good thermal shock and wear resistance makes the boards very applicable in steel ladles as back-up insulation and as hot-face application in furnaces of mild condition, i.e. flue gases containing only few particles of low wear-resisting characteristics. The extremely high physical strength of VIP-12 HS combined with good thermal resistance makes the board ideal as back-up insulation in continuous caster tundishes.

### Standard sizes

Skamol VIP-12 HS boards are available in the following standard sizes:

Metric:	
Length x width	Thickness
300 x 115 mm	12.7 – 15 mm
Max. 480 x 300 mm	10 mm
Max. 610 x 305 mm	12.7 – 15 – 20 – 25 mm
US/British:	
11.8" x 4.5"	0.5" – 0.6"
Max. 18.9" x 11.8"	0.4"
Max. 24" x 12"	0.5" – 0.6" – 0.8" – 1.0"

Customer specific sizes are available on request.

### Dimensional tolerances

Length and width ..... ± 2.5 mm (0.10")  
 Thickness ..... ± 1.0 mm (0.04")

### Applications

- Ladles
- Tundishes
- Torpedo cars

### Key Advantages

- High energy savings as the board is very insulating
- Provides improved safety for applications
- Reduced CO<sub>2</sub> emission due to low heat flow
- Lower shell temperatures
- Longer wear of refractories due to high service temperature
- Fewer relinings as lifetime of ladles are increased
- Reduced consumption of refractories
- High compressive strength makes lining safer and stronger

### High max. service temperature

combined with low thermal conductivity values enables the steel to wear 40-100 mm more of refractories than conventional insulating boards. Also, it makes the handling of ladles far safer.

### Longer lifetime of wear lining

means less overall consumption of refractories and insulating material. This results in improved production economy and reduces production costs per ton steel.

### High compressive strength

- increasing to working temperature level.

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<b>Maximum service temperature (PrEN 14306:2002)</b>		
	°C	1150
	°F	2102
<b>Bulk density, dry (EN 1094-4)</b>		
	kg/m <sup>3</sup>	1225
	lbs/cu.ft.	77
<b>Compressive strength (EN 1094-5: 1995)</b>		
@ room temperature	MPa	18.5
	lbs/sq.in.	2683
<b>Modulus of rupture (EN 993-7:1998)</b>		
	MPa	5.0
	lbs/sq.in.	725
<b>Total porosity (EN 1094-4: 1995)</b>		
	%	55
<b>Specific heat</b>		
	kJ/(kg×K)	1.0
	BTU/(lb×°F)	0.24
<b>Coefficient of reversible thermal expansion (BS 1902: section 5.3: 1990)</b>		
@ 20°C-750°C (68°F-1382°F)	K <sup>-1</sup>	10×10 <sup>-6</sup>
	°F <sup>-1</sup>	5.6×10 <sup>-6</sup>
<b>Linear reheat shrinkage (EN 1094-6: 1999)</b>		
12 h at 1100°C (2012°F)	%	0.9
<b>Pyrometric cone equivalent (ASTM C24-89 ORTON cones)</b>		
	°C	1330
	°F	2426
<b>Thermal conductivity (EN 993-15:1998) Hot wire</b>		
mean temp. @ 200°C	W/(m×K)	0.27
@ 400°C		0.29
@ 600°C		0.30
@ 800°C		0.32
@ 1000°C		0.33
@ 392°F	BTU/(sq.ft.×h×°F/in)	1.87
@ 752°F		1.98
@ 1112°F		2.08
@ 1472°F		2.22
@ 1832°F		2.29
<b>Chemical analysis, typical</b>		
	%	
Silica	SiO <sub>2</sub>	48
Titanium dioxide	TiO <sub>2</sub>	1.1
Ferric oxide	Fe <sub>2</sub> O <sub>3</sub>	3.5
Alumina	Al <sub>2</sub> O <sub>3</sub>	27
Magnesium oxide	MgO	7.4
Calcium oxide	CaO	4.7
Sodium oxide	Na <sub>2</sub> O	0.3
Potassium oxide	K <sub>2</sub> O	6.2
Loss on ignition 1025°C (1877°F)	LOI	2.4
<b>Colour</b>		SAND
<b>HS Tariff number</b>		
(Harmonized Commodity Description and Coding System)		6806.90.00

Note: The TC value for Skamol VIP-12 HS at 1000°C (1832°F) is estimated.

Data are average results of tests conducted under standard procedures and are subject to variation. Data contained in this data sheet are supplied in good faith as a technical service and are subject to change without notice. Misprint and errors excepted.

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