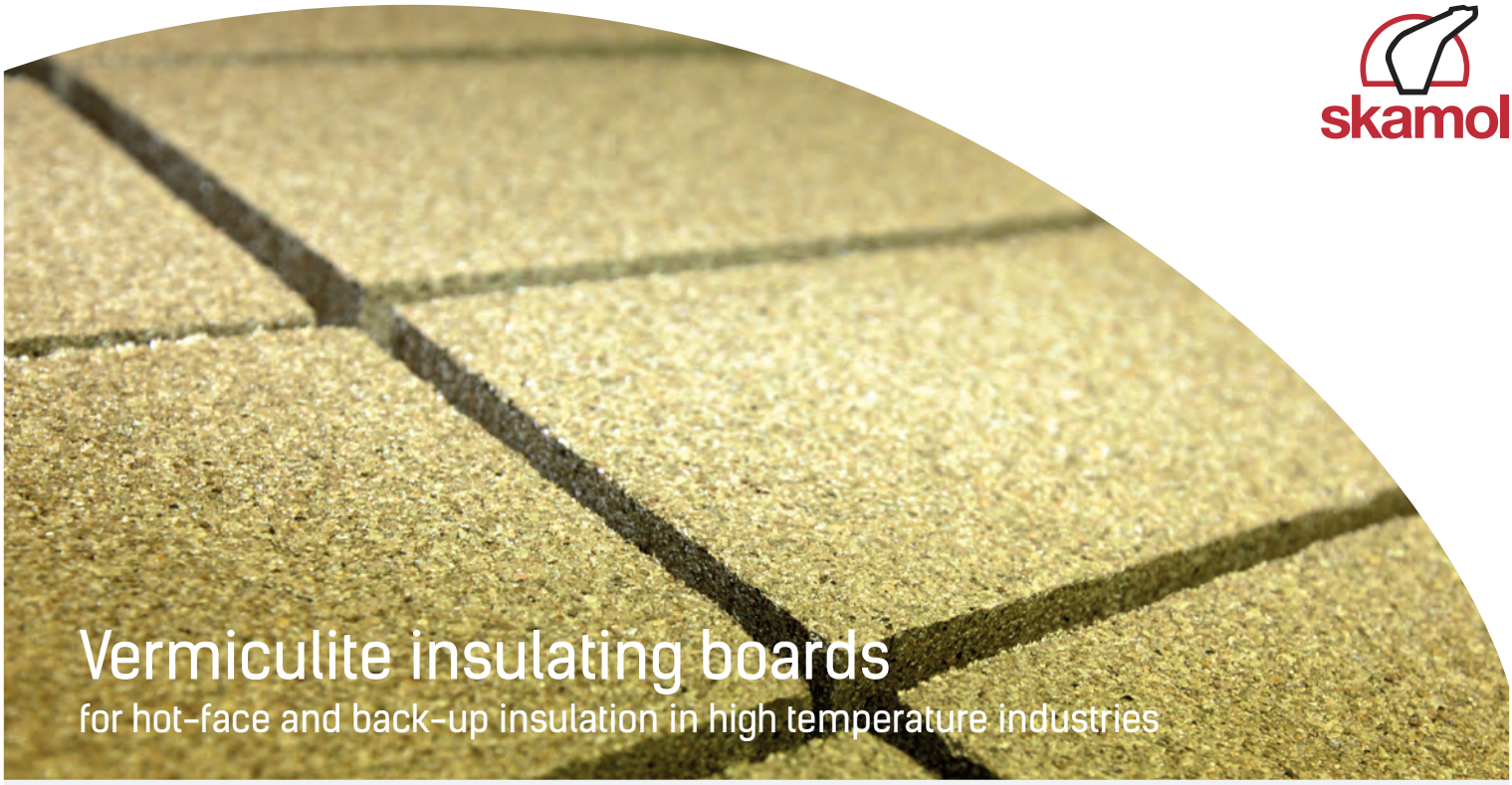

Vermiculite insulating boards

for hot-face and back-up insulation in high temperature industries

Description

The Skamol V-1100 (600), V-1100 (700), VIP-900, VIP-12 HS and VIP-12 HT is a range of vermiculite based insulating boards recommended for the high temperature industries. They have good thermal properties, are highly thermal shock resistant and show a reasonable wear resistance. Especially the VIP-12 HS has been designed to obtain a high strength and good wear resistance. The VIP-12 HT has been designed to meet high service temperatures.

The low thermal conductivity secures application of our vermiculite boards to be energy saving and thus cost effective.

Skamol vermiculite boards cover several grades in various combinations of bulk density, thermal conductivity properties and compressive strength. Standard grades include:

- V-1100 (600)
- V-1100 (700)
- VIP-900
- VIP-12 HS
- VIP-12 HT

Application

Our high density vermiculite insulating boards are clean to handle and easy to install. The product composition allows for easy cutting, machining and shaping of all board types on site using ordinary wood-working tools. Jointing mortar recommended is Skamol FL-06, see separate data sheet.

Skamol V-1100 (600) and V-1100 (700)

V-1100 boards combine high strength with low thermal conductivity and are designed for a maximum service temperature of 1100°C (2012°F). The whole range of boards is ideal for back-up insulation, and the V-1100 (600) and V-1100 (700), can be used as hot-face application in furnaces with very mild flue gas containing no wear particles. V-1100 boards are not attacked by molten aluminium; therefore they can be applied in the secondary aluminium industry, for example in holding furnaces, filter boxes and in launders as back-up insulation and as top lid. The high physical strength of V-1100 (700) combined with good thermal resistance makes the board ideal as back-up insulation in continuous casters and tundishes.

Skamol VIP-900, VIP-12 HS and VIP-12 HT

The VIP-900, VIP-12 HS and VIP-12 HT offer maximum service temperatures between 1050°C (1922°F) and 1250°C (2282°F). All three products have excellent thermal conductivity and high compressive strength characteristics in common. This, combined with the good thermal shock and wear resistance, makes the boards very applicable in torpedo cars, steel ladles and tundishes or continuous casters 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 and where there is no direct firing.

Standard sizes and designs

Our vermiculite insulating boards are available in many standard sizes. Various standard design concepts are also developed and extensive know-how on special shapes and designs are available.

	Thickness	
Product	Metric	US/British
V-1100 (600)	20 through 75 mm	¾" through 3"
V-1100 (700)	16 through 50 mm	⅝" through 2"
VIP-900	20 through 75 mm	¾" through 3"
VIP-12 HS	12.7 - 60 mm	½" - 2½"
VIP-12 HT	12.7 - 60 mm	½" - 2½"

Dimensional tolerances

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

- V-1100 (600)
- V-1100 (700)
- VIP-900
- VIP-12 HS
- VIP-12 HT

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Vermiculite insulating boards

hot-face and back-up insulation up to 1250°C (2282°F)

Grade			V-1100 (600)	V-1100 (700)	VIP-900	VIP-12 HS	VIP-12 HT
Maximum service temperature		°C	1100	1100	1150	1050	1250
		°F	2012	2012	2102	1922	2282
Bulk density, dry		kg/m^3	600	700	900	1225	1400
		lbs/cu.ft.	38	44	56	77	87
Cold crushing strength (DS/EN ISO 8895_2006)		MPa	4.2	4.5	6.3	22.0	14
		lbs/sq.in.	609	653	914	3191	2030
Modulus of rupture (V-1100 + VIP-900 + VIP-12 HT: EN 993-6:1995) (VIP-12 HS: EN 993-7:1998)		MPa	1.6	2.0	2.1	-	2.5
		lbs/sq.in.	232	290	305	-	363
Linear reheat shrinkage (EN 1094-6:1999)							
12h @ 1000°C (1832°F)		%	1.0	1.0	-	0.9	-
12h @ 1100°C (2012°F)			-	-	1.2		-
12h @ 1150°C (2102°F)			-	-	-	-	1.0
Total porosity (EN 1094-4:1995)		%	76	74	57	55	50
Specific heat		kJ/(kg×K)	0.94	0.94	1.14	1.00	-
		BTU/(lb×°F)	0.22	0.22	0.27	0.24	-
Coefficient of reversible thermal expansion							
@ 20°C - 750°C (68°F - 1382°F)		$x10^{-6}\ K^{-1}$	11.0	11.0	8.9	17.8	8.9
		$x10^{-6}\ °F^{-1}$	6.1	6.1	4.9	9.8	4.9
Resistance to thermal shock (EN 993-11:1999)		Cycles	> 30	> 30	> 30	> 30	-
Pyrometric Cone Equivalent (ASTM C24-89 Orton cones)		°C	1300	1300	-	1300	-
		°F	2372	2372	-	2372	-
Thermal conductivity (ASTM C-182)	@ 200°C	W/(m×K)	0.16	0.19	0.18	0.20	0.32
	@ 400°C		0.18	0.20	0.19	0.22	0.31
	@ 600°C		0.20	0.21	0.20	0.24	0.31
	@ 800°C		0.22	0.22	0.23	0.27	0.34
	@1000°C		-	-	0.26	0.30	0.37
	@ 392°F	BTU/(sq.ft.×h×°F/in.)	1.11	1.32	1.24	1.39	2.22
	@ 752°F		1.25	1.39	1.31	1.51	2.15
	@ 1112°F		1.39	1.46	1.38	1.67	2.15
	@ 1472°F		1.53	1.53	1.59	1.87	2.36
	@1832°F		-	-	1.80	2.08	2.57
Chemical analysis, typical		%					
Silica		SiO_2	46	46	44	48	45
Titanium dioxide		TiO_2	0.7	0.7	0.7	1.1	0.4
Ferric oxide		Fe_2O_3	5.5	5.5	7.1	3.5	6.9
Alumina		Al_2O_3	7.0	7.0	6.3	27.0	4.3
Magnesium oxide		MgO	19.0	19.0	25.9	7.4	32.6
Calcium oxide		CaO	3.5	3.5	3.0	4.7	1.4
Sodium oxide		Na_2O	0.2	0.2	0.1	0.3	0.1
Potassium oxide		K_2O	10.0	10.0	6.9	6.2	6.1
Loss on ignition 1025°C (1877°F)		LOI	7.0	7.0	4.0	2.4	2.8
HS Tariff number (Harmonized Commodity Description and Coding System)			6806.90.00	6806.90.00	6806.90.00	6806.90.00	6806.90.00
Colour			SAND	SAND	SAND	SAND	SAND

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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