Norbide® Hot Pressed Boron Carbide Tiles

CARBORUNDUM

Sizes with Tolerances

- 3 standard sizes are available: 8" x 8", 16" x 16", 11" x 17". See the following detailed data.
- Other custom sizes available upon request.

11" x 17" nominal – Standard Sizes

Length		Tolerance (±)		Width		Tolerance (±)		Thickness		Tolerance (±)		Max. Deflection**	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.118	3.0	0.012/0.012	0.3/0.3	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.157	4.0	0.012/0.012	0.3/0.3	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.197	5.0	0.012/0.012	0.3/0.3	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.217	5.5	0.012/0.012	0.3/0.3	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.236	6.0	0.012/0.012	0.3/0.3	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.276	7.0	0.016/0.016	0.4/0.4	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.295	7.5	0.016/0.016	0.4/0.4	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.315	8.0	0.016/0.016	0.4/0.4	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.354	9.0	0.020/0.020	0.5/0.5	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.394	10.0	0.020/0.020	0.5/0.5	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.472	12.0	0.024/0.024	0.6/0.6	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.551	14.0	0.024/0.024	0.6/0.6	0.060	1.524
17	432	0.5/0	13/0	11	279	0.5/0	13/0	0.630	16.0	0.028/0.028	0.7/0.7	0.060	1.524

Notes: **Maximum deflection (warpage) of center of tile when measured across a diagonal

16" x 16" nominal – Standard Sizes

Length		Tolerance (±)		Width		Tolerance (±)		Thickness		Tolerance (±)		Max. Deflection**	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.118	3.0	0.012/0.012	0.3/0.3	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.157	4.0	0.012/0.012	0.3/0.3	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.197	5.0	0.012/0.012	0.3/0.3	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.217	5.5	0.012/0.012	0.3/0.3	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.236	6.0	0.012/0.012	0.3/0.3	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.276	7.0	0.016/0.016	0.4/0.4	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.295	7.5	0.016/0.016	0.4/0.4	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.315	8.0	0.016/0.016	0.4/0.4	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.354	9.0	0.020/0.020	0.5/0.5	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.394	10.0	0.020/0.020	0.5/0.5	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.472	12.0	0.024/0.024	0.6/0.6	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.551	14.0	0.024/0.024	0.6/0.6	0.080	2.032
16	406	0.5/0	13/0	16	406	0.5/0	13/0	0.630	16.0	0.028/0.028	0.7/0.7	0.080	2.032

Notes:**Maximum deflection (warpage) of center of tile when measured across a diagonal

8” x 8” nominal – Standard Sizes

Length		Tolerance (±)		Width		Tolerance (±)		Thickness		Tolerance (±)		Max. Deflection**	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.118	3.0	0.012/0.012	0.3/0.3	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.157	4.0	0.012/0.012	0.3/0.3	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.197	5.0	0.012/0.012	0.3/0.3	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.217	5.5	0.012/0.012	0.3/0.3	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.236	6.0	0.012/0.012	0.3/0.3	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.276	7.0	0.016/0.016	0.4/0.4	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.295	7.5	0.016/0.016	0.4/0.4	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.315	8.0	0.016/0.016	0.4/0.4	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.354	9.0	0.020/0.020	0.5/0.5	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.394	10.0	0.020/0.020	0.5/0.5	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.472	12.0	0.024/0.024	0.6/0.6	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.551	14.0	0.024/0.024	0.6/0.6	0.040	1.016
8	203	0.5/0	13/0	8	203	0.5/0	13/0	0.630	16.0	0.028/0.028	0.7/0.7	0.040	1.016

Notes:**Maximum deflection (warpage) of center of tile when measured across a diagonal

Hot Pressed Boron Carbide Tiles – Typical Physical Properties

Property	Units	Hot Pressed B_4C (Typical Values)	Test Method
Density	gm/cm^3	2.50	Water displacement
Young’s Modulus	GPa	440	Untrasonic wave velocity
Shear Modulus	GPa	184	Untrasonic wave velocity
Poisson’s Ratio		0.18	Untrasonic wave velocity
Hardness (Vickers)	GPa	28	At 5 kg load
Hardness (Knoop)	Kg/mm^2	2800	At 0.1 kg load
Flexural Strength, 20°C	MPa	425	4-point bend, ASTM C1161-90
Fracture Toughness, 20°C	$MPam^{0.5}$	3.1	Indentation strength at 5 kg load
Thermal conductivity, 20°C	W/mK	90	Laser flash technique
Thermal Expansion, 20-800°C	X 10-6/C	5	Dilatometry

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