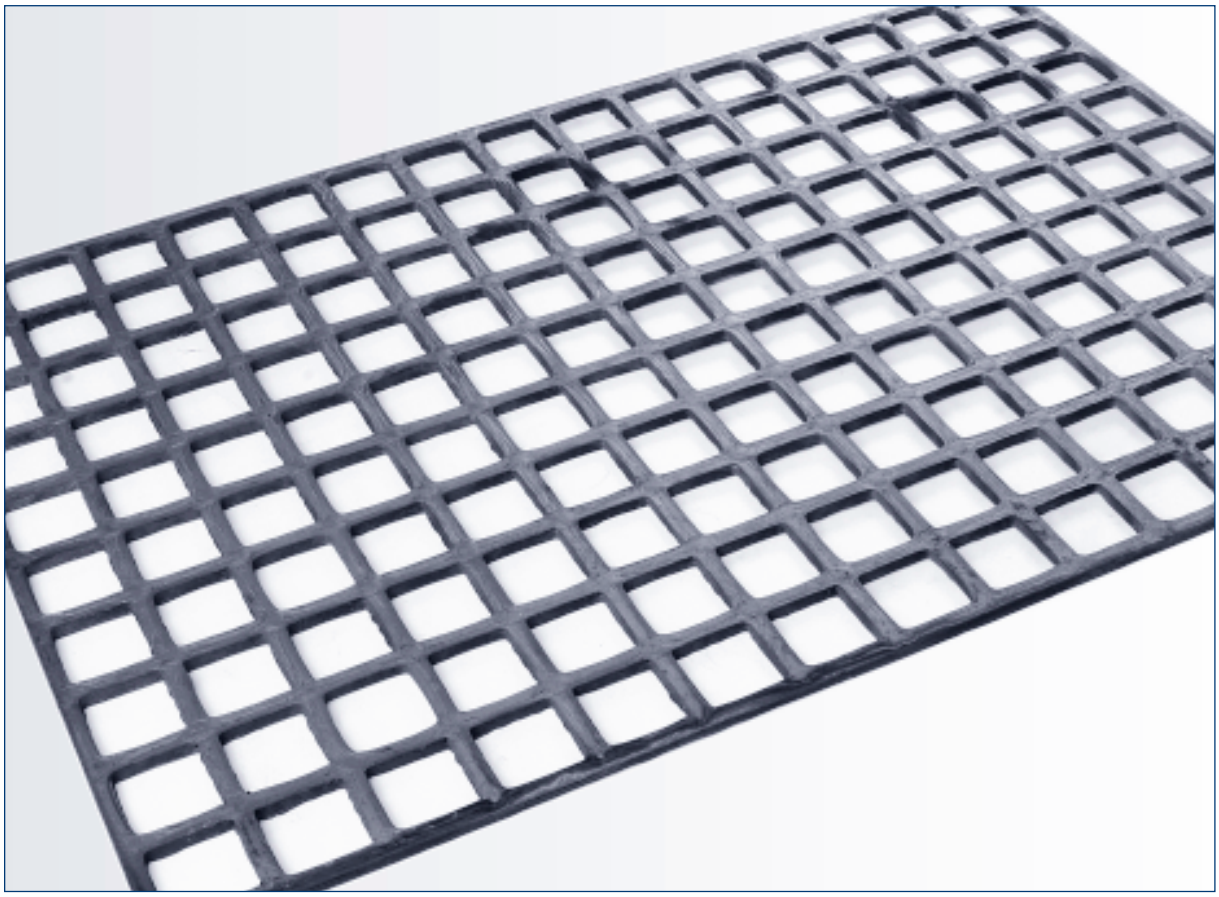
Schunk Graphite Technology

UniGrid™ Composite Grid

Grid



The heart of the UniGrid™ system is the revolutionary UniGrid™ composite grid. It is revolutionary because of its patented manufacturing method, which allows it to be produced with essentially no wasted material. This technology reduces the cost of making a grid, thus bringing the many benefits of carbon / carbon (C/C) composites to the end user.

As temperatures increase, C/C generally increases in both strength and stiffness. This behavior is just the opposite of metals which become softer, weaker, and exhibit deformation through creep. With higher temperatures and reduced cycle times, this is truly the material of the future, available today. It is light in weight, which means reduced thermal mass. This translates into shorter cycle times, reduced power consumption, and reduced operating costs.

It is stackable for stability while loading or resting in the furnace. It is modular with 150 different locations for the legs. You determine how to configure the system so it matches your needs in the best manner possible.

Load capacity of the grid depends on the leg configuration, please contact your Schunk representative to discuss the specific loading of your system. Use the UniGrid™ system to increase your throughput, and your profits!

Name	Size	Weight	Item #
UniGrid™ Composite Grid	24" x 36" x 0.4" (610 x 910 x 10mm)	6.7 lbs. (3010 g)	600-620977-1

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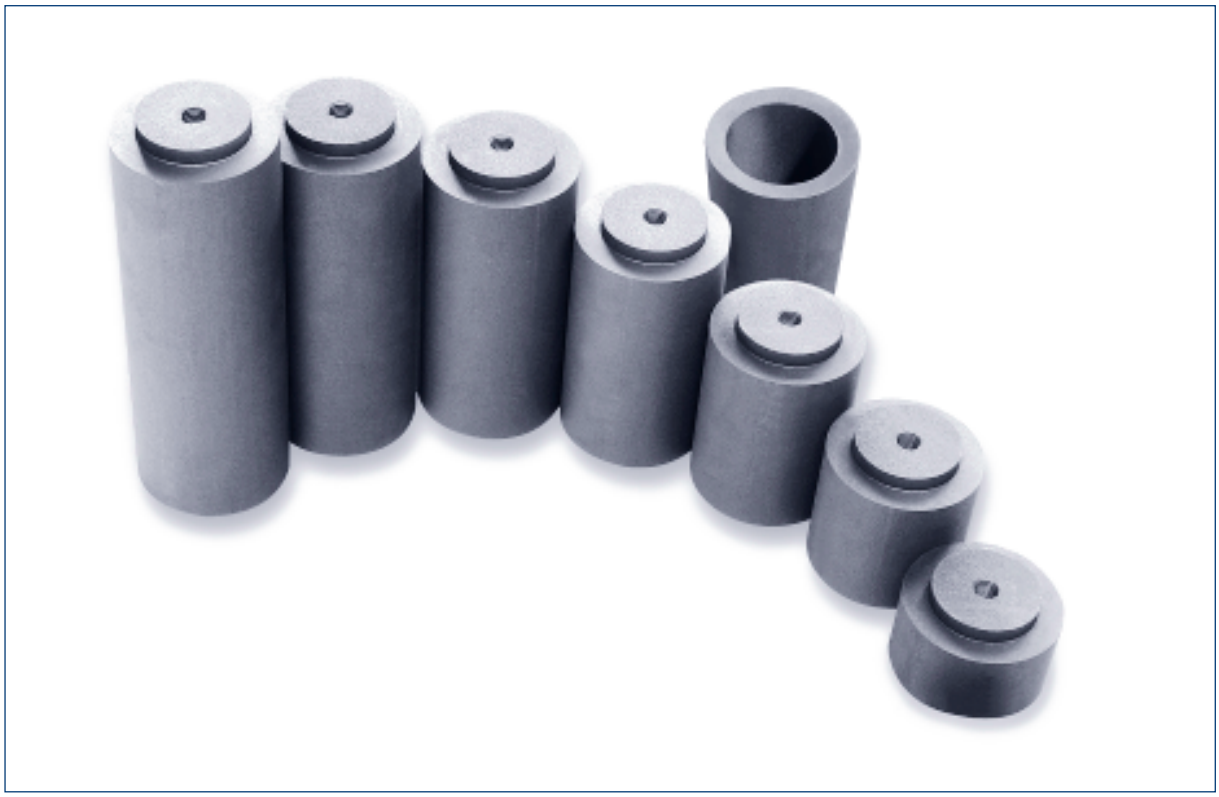
UniGrid™ Legs



Modular design is one of the many benefits of using the UniGrid™ system, and our standard legs are a big part of that design. Legs are used in conjunction with a base and composite studs, to attach securely to the grid in any location you choose. This creates interlocking and stackable layers, to prevent load shifting. With 150 possible leg locations on a single grid, you decide how to match the system to your needs. Standard legs allow for free space between layers of 2”, 3”, 4”, 5”, 6”, 7” and 8” (51, 76, 102, 127, 152, 178, and 203mm). Custom sizes are also readily available. Why waste valuable space in your furnace? Use the UniGrid™ system to increase your throughput, and your profits!

Name	Spacing Between Layers	Size	Weight	Item #
UniGrid™ Leg	2" (50mm)	ø 2.75" x 1.5" (ø 70 x 38mm)	0.40 lbs (182 g)	600-620970-02
UniGrid™ Leg	3" (76mm)	ø 2.75" x 2.5" (ø 70 x 63mm)	0.55 lbs (250 g)	600-620970-03
UniGrid™ Leg	4" (102mm)	ø 2.75" x 3.5" (ø 70 x 89mm)	0.75 lbs (341 g)	600-620970-04
UniGrid™ Leg	5" (127mm)	ø 2.75" x 4.5" (ø 70 x 114mm)	0.95 lbs (431 g)	600-620970-05
UniGrid™ Leg	6" (152mm)	ø 2.75" x 5.5" (ø 70 x 140mm)	1.10 lbs (499 g)	600-620970-06
UniGrid™ Leg	7" (178mm)	ø 2.75" x 6.5" (ø 70 x 165mm)	1.25 lbs (568 g	600-620970-07
UniGrid™ Leg	8" (203mm)	ø 2.75" x 7.5" (ø 70 x 190mm)	1.45 lbs (658 g)	600-620970-08

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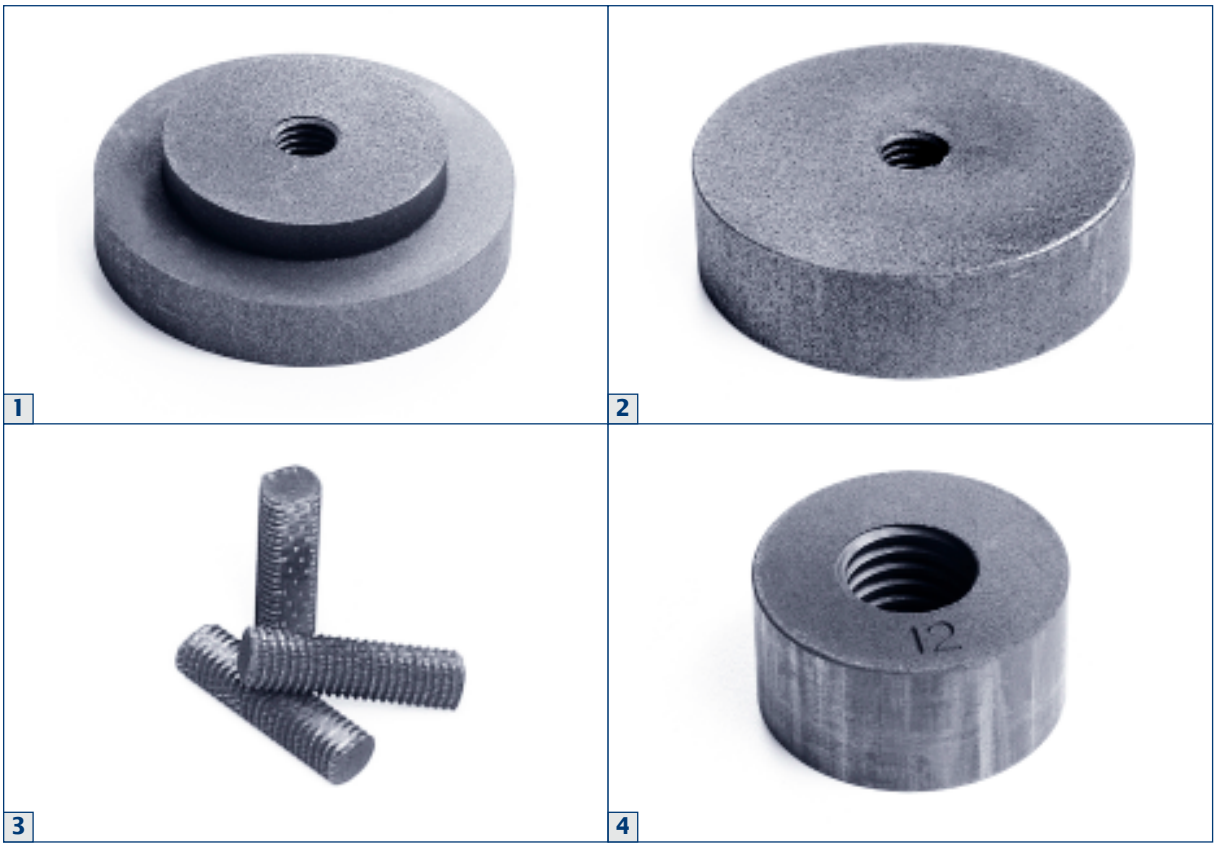
UniGrid™ Base and Studs



1 2 3 4

Modular design is one of the many benefits of using the UniGrid™ system, and our bases and studs are a big part of that design. The standard base is used underneath the bottom grid as a foot, and also on top of each grid layer. This creates interlocking and stackable layers, to prevent load shifting. In some cases, it is beneficial to use the system in an inverted configuration. For this purpose, we offer an inverted base for use as a foot under only the bottom layer. These items are held in place by high-strength C/C studs. A jamb nut is available if you plan to change configurations frequently. Why waste valuable space in your furnace? Use the UniGrid™ system to increase your throughput, and your profits!

	Name	Size	Weight	Item #
1	UniGrid™ Base	ø 2.75" x 0.5" (ø 70 x 12mm)	0.23 lbs (104 g)	600-620970-00
2	UniGrid™ Inverted Base	ø 2.75" x 0.75" (ø 70 x 19mm)	0.25 lbs (114 g)	600-620970-01
3	UniGrid™ Stud	1.625" (41mm)	0.013 lbs (6 g)	600-620978-1
3	UniGrid™ Stud	2.125" (54mm)	0.017 lbs (8 g)	600-620978-2
4	UniGrid™ Jamb Nut	ø 1" x 0.5" (ø 25 x 13mm)	0.02 lbs (9 g)	400-620930-12

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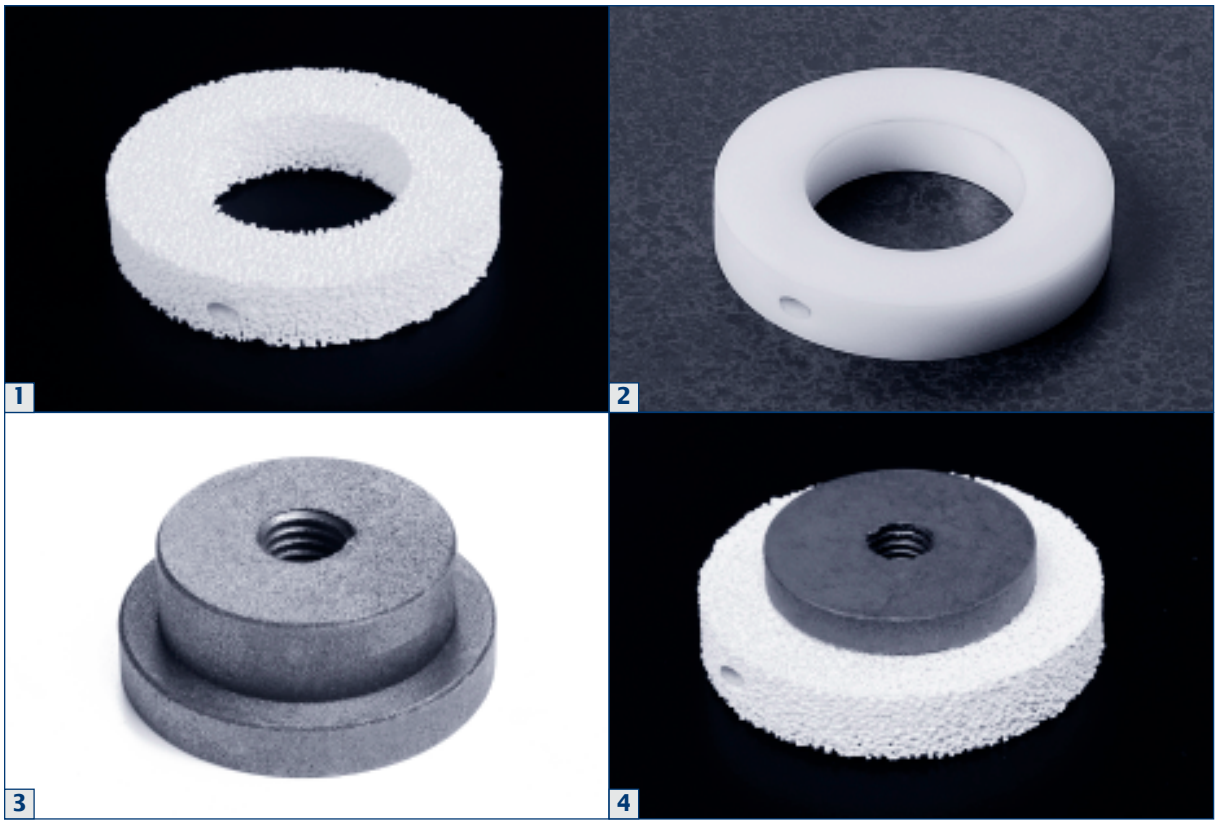
UniGrid™ Survey Adapters



All vacuum furnaces must be surveyed on a regular basis to assure proper performance and process integrity. For smaller furnace sizes, a simple and inexpensive set of adapters allows you to use the UniGrid™ system as a survey fixture.

Two different types of CarboGard™ ceramic rings are available to act as thermocouple holders. The porous ring is used with an unloaded grid acting solely as a survey fixture. The solid ring can be used with a loaded or unloaded grid. This means you can use the system as a separate survey fixture, or it can act as a survey fixture during full production furnace runs.

Both porous and solid survey rings are held in place by a survey nut and a C/C stud. This combination is geometrically the same as our standard base, so it can easily and economically be used for a 9-point survey system. Photo #4 shows the porous adapter and survey nut assembled and ready for use.

Use the UniGrid™ system to increase your through-put, and your profits!

	Name	Size	Weight	Item #
1	UniGrid™ Survey Adapter (Porous)	ø 2.75" x 0.5" (ø 70 x 12mm)	0.07 lbs (30 g)	600-620970-51
2	UniGrid™ Survey Adapter (Solid)	ø 2.75" x 0.5" (ø 70 x 12mm)	0.29 lbs (130 g)	600-620970-50
3	UniGrid™ Survey Nut	ø 1.85" x 0.75" (ø 47 x 19mm)	0.08 lbs (38 g)	600-620970-61

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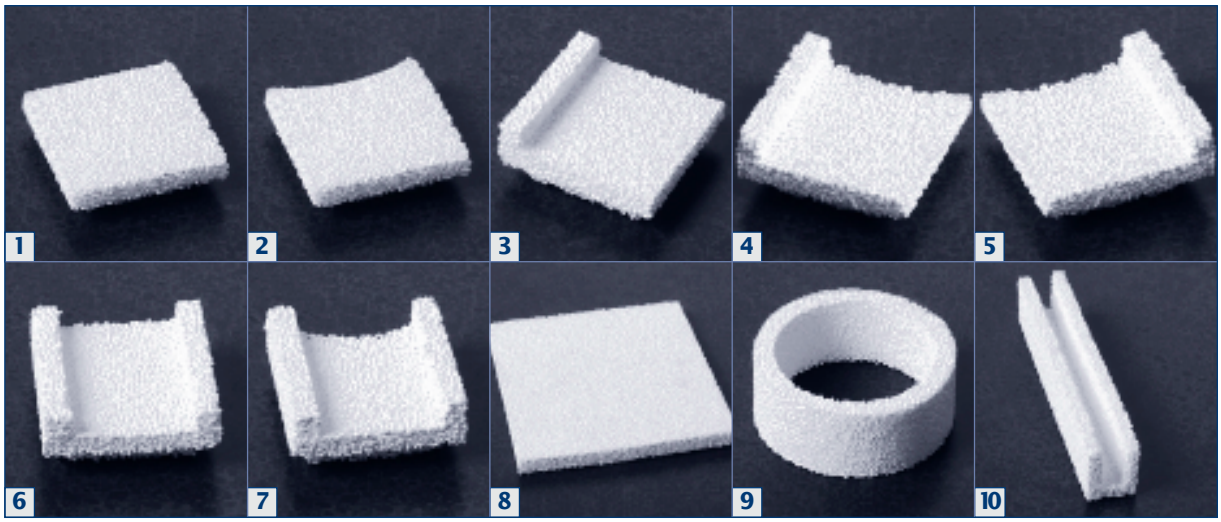
CarboGard™ Ceramics



CarboGard™ ceramic components are made of a lightweight and thermal shock resistant, porous, 99.5% high-purity alumina. These parts allow you to isolate the load from the carbon-based fixture components, if your load and process have the potential for the formation of a eutectic mixture. Most standard parts are designed to fit into the square holes of the UniGrid™ composite grid.

Several styles are available to match your needs, including some with curbs to prevent load shifting, or a radius on one side for placement next to a leg. Rings to surround the legs are also available from stock. All standard CarboGard™ ceramic parts are shipped "as fired" and are not machined after firing. Use the UniGrid™ system to increase your throughput, and your profits!

	Name	Size	Weight	Item #
1	CarboGard™ Tile	2.25" x 2.25" (57 x 57mm)	0.08 lbs (33 g)	600-620971-00
2	CarboGard™ Tile w/ radius	2.25" x 2.25" (57 x 57mm)	0.07 lbs (30 g)	600-620971-01
3	CarboGard™ Tile w/ 1 curb	2.25" x 2.25" (57 x 57mm)	0.10 lbs (43 g)	600-620972-00
4	CarboGard™ Tile w/ radius and 1 curb right-handed	2.25" x 2.25" (57 x 57mm)	0.09 lbs (40 g)	600-620972-01
5	CarboGard™ Tile w/ radius and 1 curb left-handed	2.25" x 2.25" (57 x 57mm)	0.09 lbs (40 g)	600-620972-02
6	CarboGard™ Tile w/ 2 curbs	2.25" x 2.25" (57 x 57mm)	0.12 lbs (53 g)	600-620973-00
7	CarboGard™ Tile w/ radius and 2 curbs	2.25" x 2.25" (57 x 57mm)	0.12 lbs (50 g)	600-620973-01
8	CarboGard™ Tile	6" x 6" x 0.5" (152 x 152 x 13mm)	0.56 lbs (254 g)	600-620974-00
9	CarboGard™ Ring	ø 3.625" x 1.5" (ø 72 x 38mm)	0.22 lbs (98 g)	600-620975-00
10	CarboGard™ U-channel	6" x 1.25" x 1" (152 x 31 x 25mm)	0.14 lbs (63 g)	600-620976-00

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