

HIGH ALUMINA COMPOSITES

RS-DR, RS-DD, RS-DM, RS-DA

ZIRCAR Refractory Sheet Type RS-D is a group of medium density reinforced matrix composite products produced in a thin sheet form. Type RS-D is comprised of a high purity alumina matrix reinforced with high temperature ceramic fibers. Type RS-D has a maximum use temperature of 1200°C (2192°F) and is available in four forms, making it a versatile product useful in many applications. Type RS-D is also resistant to corrosion in numerous environments.

Refractory Sheet Type RS-D are available in four Types:

- **Refractory Sheet Type RS-DR**

RS-DR is a rigid pre-fired sheet which has been heat-treated to remove all organic binder rendering it stable to moisture attack. RS-DR can be readily machined to exacting dimensional tolerances with conventional tooling. It possesses high compressive and flexural strength and is therefore useful as a structural insulation material. Its high dielectric strength makes it suitable for use as a high temperature electrical insulation.

- **Refractory Sheet Type RS-DD**

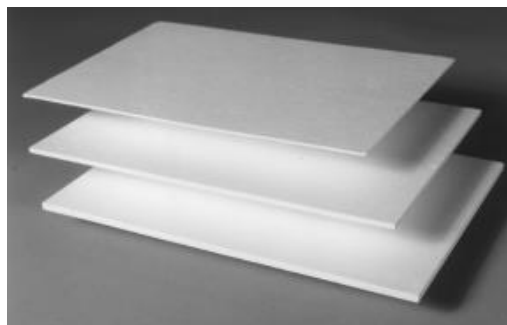
RS-DD is a dried, rigid sheet which can be moistened with water to impart moldability. RS-DD can be molded into shape and dried. When exposed to a temperature of 300°C (570°F), it will become permanently rigid. At this point RS-DD will exhibit properties and characteristics like Type DR.

- **Refractory Sheet Type RS-DM**

RS-DM is a pre-moistened moldable Type D product. RS-DM is easily formed into complex shapes and can be dried and fired to impart high strength. RS-DM is ideally suited for use as a mold for slumping and fusing of glass.

- **Refractory Sheet Type RS-DA**

RS-DA is a moldable Type D product which exhibits lower density than RS-DM, making it highly moldable. Drying with subsequent heat treatment to 300°C will result in a permanently rigid structure.



CYLINDERS/CUSTOM SHAPES

Custom boards, shapes and preparations are available on request. Our forming processes, large inventory of custom tooling and state of the art machining techniques allow a wide variety of sizes and shapes to be made. Special geometries such as disks, rings, gaskets and custom-machined shapes can be fabricated. Tight tolerance machining, compositional variations and the application of surface rigidizers and hardening agents are available. Please contact us with your special requirements.

FABRICATION GUIDELINES

RS-DA and RS-DM can be readily cut with a knife or scissors. Joints can be made by wetting both surfaces with water, (with a sponge or brush), and promptly pressing the two surfaces together. Thicker sheets can be made by laminating two or more sheets together in this manner. RS-DD is suitable for die cutting or stamping of gaskets. They can be re-wet, made moldable, and handled like RS-DD. RS-DR cuts and handles similar to RS-DD except it is slightly less compressible and more rigid. They can be machined to precision tolerances with conventional tooling.

SUGGESTED APPLICATIONS

- Asbestos cement board replacement
- Oven construction
- Induction heating lining and coil fixtures
- High temperature gasketing
- Molded shapes, tubes, trays, boats for sintering and heat treating
- Art glass slumping and fusing molds
- Heating element support
- Fireproof structural insulation
- Brazing separators and fixtures
- Hot furnace repairs
- Non-ferrous metal handling, spouts, troughs, casting tips
- Induction hot press insulation

ZIRCAR Refractory Composites, Inc.

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Technical Data
Bulletin No. ZRCI-022
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HIGH ALUMINA MATRIX SHEETS

PHYSICAL PROPERTIES AND CHARACTERISTICS

| TYPE | RS-DM | RS-DD | RS-DR | RS-DA |
|--|--|--|--|--|
| Form | Moldable Sheet | Rigid Sheet | Rigid Sheet | Moldable Sheet |
| Nominal Composition, wt% | | | | |
| Al ₂ O ₃ | 90 | 90 | 90 | 90 |
| SiO ₂ | 10 | 10 | 10 | 10 |
| Organic | <1 | <1 | <1 | <1 |
| Color | White | White | White | White |
| Max. Use Temp., C°(F°) | 1300(2370) | 1300(2370) | 1300(2370) | 1300(2370) |
| Specific Heat, J/kg°K(BTU/lb°F) at 600° | 1047(0.25) | 1047(0.25) | 1047(0.25) | 1047(0.25) |
| Flammability | Nil | Nil | Nil | Nil |
| Thermal Expansion, RT-400°C(754°F) | 6.0x10 ⁻⁶ /°C (3.3x10 ⁻⁶ /°F) | 6.0x10 ⁻⁶ /°C (3.3x10 ⁻⁶ /°F) | 6.0x10 ⁻⁶ /°C (3.3x10 ⁻⁶ /°F) | 6.0x10 ⁻⁶ /°C (3.3x10 ⁻⁶ /°F) |
| Density, as supplied, gm/cc(pcf) | 2.1(130)^ | 2.1(130) | 2.1(130) | 1.6(100)^ |
| Porosity, % | 56 | 48 | 48 | - |
| Modulus of Rupture**, MPa(psi) as received | 21(3000)^ | 21(3000) | 21(3000) | 3.4(490) |
| Compressive Strength**, MPa (psi) at 3% compression | - | 41.4(6000) | 62(9000) | 12(2134) |
| Thermal Conductivity, W/m°K(BTU/hr. ft² °F/in) | 0.64(4.5)^ | 0.64(4.5) | 0.64(4.5) | 0.53(3.8) |
| Linear Shrinkage, % Length/Thickness | | | | |
| after 4 hrs. at 1000°C(1832°F) | - | 0.3 / 1 | 0.3 / 1 | - |
| after 4 hrs. at 1200°C(2192°F) | - | 1 / 4 | 1 / 4 | - |
| after 4 hrs. at 1400°C(2552°F) | - | 8 / 10 | 8 / 10 | - |
| Hardness, Durometer "D" | - | 80 | 85 | - |
| Electrical Properties | | | | |
| Volume Resistivity, ohm-cm | - | 5 x 10 ⁷ | 5 x 10 ⁷ | - |
| Dielectric Strength, Volts/mil | | 530 | 530 | |
| Arc resistance, sec. | | 360 | 360 | |

**Properties expressed parallel to thickness.

AVAILABILITY

ITEM # DESCRIPTION

JS01 RS-DA, 18" X 24" X .020"
 JS02 RS-DA, 18" X 24" X .040"
 JS03 RS-DA, 18" X 24" X .080"
 JS04 RS-DA, 18" X 24" X .120"
 JS05 RS-DA, 36" X 48" X .020"
 JS06 RS-DA, 36" X 48" X .040"
 JS07 RS-DA, 36" X 48" X .080"
 JS08 RS-DA, 36" X 48" X .120"
 JS20 RS-DM, 18" X 24" X .020"
 JS21 RS-DM, 18" X 24" X .040"
 JS22 RS-DM, 18" X 24" X .080"

ITEM # DESCRIPTION

JS23 RS-DM, 18" X 24" X .120"
 JS24 RS-DM, 36" X 48" X .020"
 JS25 RS-DM, 36" X 48" X .040"
 JS26 RS-DM, 36" X 48" X .080"
 JS27 RS-DM, 36" X 48" X .120"
 JS50 RS-DD, 18" X 24" X .020"
 JS51 RS-DD, 18" X 24" X .040"
 JS52 RS-DD, 18" X 24" X .080"
 JS53 RS-DD, 18" X 24" X .120"
 JS54 RS-DD, 36" X 48" X .020"
 JS55 RS-DD, 36" X 48" X .040"

ITEM # DESCRIPTION

JS56 RS-DD, 36" X 48" X .080"
 JS57 RS-DD, 36" X 48" X .120"
 JS70 RS-DR, 18" X 24" X .020"
 JS71 RS-DR, 18" X 24" X .040"
 JS72 RS-DR, 18" X 24" X .080"
 JS73 RS-DR, 18" X 24" X .120"
 JS74 RS-DR, 36" X 48" X .020"
 JS75 RS-DR, 36" X 48" X .040"
 JS76 RS-DR, 36" X 48" X .080"
 JS77 RS-DR, 36" X 48" X .120"

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