

CUSTOM CRAFTED™ HEXAGONAL TARGET TILE



• APPLICATIONS

Christy's Custom Crafted Hexagonal Target tiles are used as a hold down media in Secondary Reformers and Autothermal Reactors utilized in the synthesis gas industry. In this service, they protect the catalyst from churning by the hydrogen-steam gas stream, which can cause channeling and erosion of the media, leading to a premature shutdown. The top of the Secondary Reformer/Autothermal Reactor is the hottest part of the unit and requires refractory materials with very low silica levels, such as Christy's HT-99 and HT-LC mixes.

Christy's Universal Circle Brick are installed under the periphery tiles against the vessel wall to form a seal and prevent gas by-pass.

• INNOVATIONS

- **Super Jumbo Hexagonal Tile** were developed in response to increased production rates at the plants, which often leads to increased catalyst bed height and a reduced distance between the tiles and the burner, as well as an overall increase in the operational temperature. SJ Hex Tile have an exceptionally large footprint and a mass of 49 lbs. (22.2 kg) per tile, giving the tile great stability and resistance against movement, even during severe upset conditions. Fewer pieces of Super Jumbos are required as opposed to other sizes, reducing installation time.

- **HT-99, 99% alumina**, high purity alumina mix was developed for its superior erosion resistance over lower alumina mixes. This high fired, high purity mix contains an ultra-low silica content, and since its development in 2004, has become Christy's flag ship material for hex tiles.

- **HT-LC Low Corrosion** mix has been developed to resolve the most severe high temperature corrosion issues found in Secondary Reformers and ATRs, in cases where the alumina itself will volatilize. HT-LC is manufactured using a proprietary, low corrosion, metal oxide formulation, which additionally has a 60% greater density than HT-99. Additional information is available for Christy's HT-LC Low Corrosion Tiles upon request.

• AVAILABLE SIZES

- Standard
- Jumbo
- Super Jumbo
- Universal Circle Brick
- Special Sizes Upon Request

| | 2" Standard | 2.5" Jumbo | 3.5" Super |
|---|--|--|------------------------------|
| Thickness, in. (cm) | 2 (5.1) | 2.5 (6.4) | 3.5 (8.9) |
| Size, Point to Point, in. (cm) | 5-5/16 (13.5) | 7-1/2 (19) | 16-1/2 (42) |
| Number of Holes (Size of Holes) | 12 (3/8" or 10 mm) 12 (1/2" or 12 mm) | 25 (1/2" or 12 mm) 25 (3/4" or 19 mm) | 140 or 46 (3/4" or 19 mm) |
| Tile Area Footprint (cm²) | 118 | 236 | 1141 |

Christy CUSTOM-CRAFTED™ Hexagonal Tiles and Circle Brick

Christy's CUSTOM-CRAFTED™ Hexagonal Tiles and Circle Brick are used as topping media (also known as a thermal shield) for secondary reformer reactors in ammonia processes. These tiles, which after installation form a stable interlocking matrix, can protect valuable catalyst from burner damage, and, by prevention of fluidization, from catalyst milling.

Available in a variety of sizes and open areas, the tiles are fabricated from an ultra-low-silica formula ideal for the high temperature reducing environment. The tiles are high-fired in our kilns for strength and durability.

Typical Sizes

| | |
|---|-----------------------|
| Standard | 117.4 cm ² |
| Jumbo | 236 cm ² |
| Super Jumbo | 1,141 cm ² |
| Thickness | 5, 6 and 9 cm |
| (*not all thicknesses are available in all sizes) | |
| Hole diameters | 10,12 and 19 mm |

Typical Elemental Analysis

| | |
|--------------------------------|---------|
| Al ₂ O ₃ | 99 %w |
| SiO ₂ | 0.15 %w |
| Fe ₂ O ₃ | 0.1 %w |

Typical Physical Properties

| | |
|----------------------|-------------------------|
| Porosity | 13-15% |
| Bulk Density | 2.9-3.0 g/cc @ 1,450° C |
| Max. Service Temp | 1,900° C |
| Compressive Strength | 103-138 MPa @ 1,450° C |

Universal Circle Bricks are used on the perimeter to obstruct gaps between the outer tiles and the refractory liner. Christy's Circle Bricks adapt to any radius, and are made of the same materials described above for the hexagonal tiles.

The above data are based on controlled testing. Individual test results may vary, therefore these data may not be used for specification purposes. Average crush strength values are actual force required by a hydraulic press to break individual spheres.
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