

## Technical News Bulletin

Owensville, July 2016

### Refractory Spout – Preferred Mix is 301

Refractory spouts funnel the molten glass to the orifice ring in order to form the gob. They mate with the tube so that the flow of glass can be stopped when the orifice ring must be replaced. The spout is a critical component in the glass feeder system.

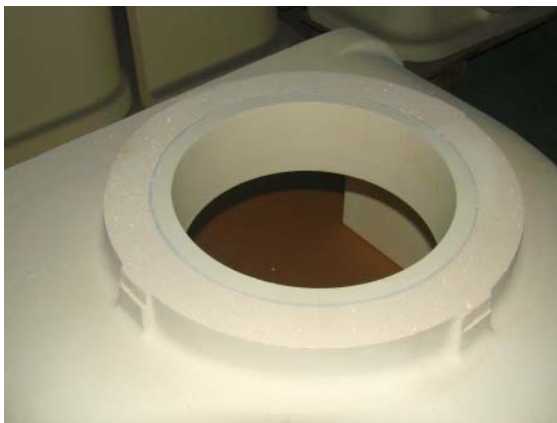
Most traditional refractory spouts last for approximately one year. As the glass pours through the throat, the refractory is eventually eroded away to the point when the tube is no longer able to sit properly onto the spout bottom surface, and the flow of glass can no longer be stemmed. The best means to address this issue, and thus significantly increase the lifetime of spout is to use a high quality refractory that resist better against the constant erosion.

Advanced manufacturing process developments have been implemented for spout bowls, to meet the stringent demands of the glass container forming process. Emhart glass 333, 315, and 301 are bonded AZS (zircon-mullite) materials containing various degrees of  $ZrO_2$ . They are produced at high firing temperatures, resulting in improved density and a highly corrosion-resistant matrix.

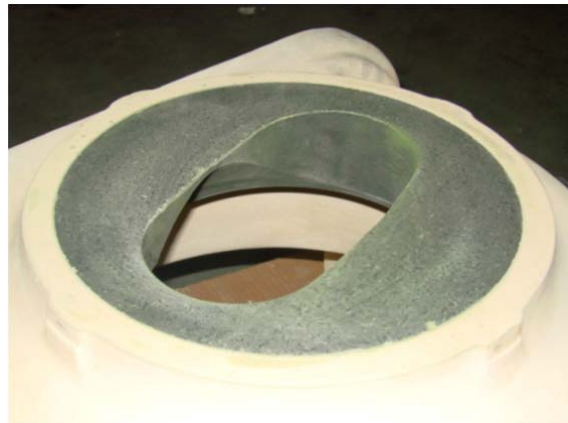
### Features and benefits

#### 301 spout with AZS or chrome-oxide insert

Spout Refractory Life increased by 1 ½ to 2 ½ time versus 315 or 301 normal spouts. Reduced down-time due to less frequent spout changes compared to non-inserted 301. All standard Emhart Glass spouts and metering spouts are available with chrome oxide or fused AZS inserts.



503 Standard spout with fused AZS insert



515 Metering spout with chrome oxide insert

**Mix 301**

Spout Refractory Life increased by 25-35% versus 315. Reduced downtime due to less frequent spout changes compared to 315. The premium 301 mix is a bonded AZS material containing 35% zirconia. This improvement in the corrosion resistant matrix causes higher productivity and less contamination in the gob.

**Mix 315**

Average 12-18 month service life. Good value/performance ratio. This is the standard material for non-inserted spouts. It provides good thermal shock resistance with high glass corrosion resistance in flint, amber or green container glass.

**Mix 333**

333 spouts are available **ONLY** for special applications. Mainly used in the tableware glass industry, where there is a demand for low-zircon containing refractory.

For further information please contact Emhart Glass Refractory Sales/Specialists.

	<b>333</b>	<b>315</b>	<b>301</b>
Typical chemical and physical properties	Only for special applications	Standard mix for spout bowls.	This is the preferred spout body material of inserted spouts. Excellent glass corrosion resistance. The lifetime is 25-35% more as the 315.
<b>ZrO<sub>2</sub></b>	<b>11.00</b>	<b>20.00</b>	<b>35.00</b>
<b>SiO<sub>2</sub></b>	15.10	10.70	19.00
<b>Al<sub>2</sub>O<sub>3</sub></b>	73.20	69.00	45.00
<b>TiO<sub>2</sub></b>	0.15	0.10	0.20
<b>Fe<sub>2</sub>O<sub>3</sub></b>	0.10	0.10	0.20
<b>Na<sub>2</sub>O</b>	N/A	0.10	0.20
<b>Other</b>	0.15	0.10	0.40
<b>MOR:</b>	2600	3100	2900
<b>Density g/cc:</b>	3.0	3.8	3.3
<b>Porosity %:</b>	18	19	18.5

**Recommended installation material:** EmCast 25 insulation castable + Microporous insulation panels.

**Detailed information:** Service Bulletin SB105; Emhart Glass Spout Change Procedure