PSR Feeder Expendables

50 years of consistency and reliability.

PSR-333 and PSR-315 – Standard materials for feeder expendables.

With over 50 years of continuous feeder expendable refractory manufacture, PSR-333 and PSR-315 have established a reputation for consistency and reliability and have become the benchmark by which other feeder expendable refractory materials are measured.

PSR-333

- A slip cast, direct bonded refractory material containing 11.25% ZrO_2.
- Major phases comprise corundum and mullite in a matrix of zircon and secondary mullite.
- Excellent corrosion resistance and resistance to thermal shock.
- Recommended for all feeder expendable applications.
- For orifice rings a fine grain version PSR-333FG is provided. This has less coarse material in the mix and has been reformulated to allow the casting of small complex shapes.

PSR-315

- A slip cast, direct bonded refractory material.
- Higher zirconia content of 18.0% and higher firing temperatures.
- Greater corrosion resistance with equivalent thermal shock properties.
- Recommended for more aggressive applications and offered as standard for spout bowls and larger diameter feeder tubes.

	SiO_2	Al_2O_3	ZrO_2	Fe_2O_3	TiO_2	CaO	MgO	Na_2O	K_2O	Bulk density	Apparent porosity	Refractoriness
	%	%	%	%	%	%	%	%	%	KG m^{-3}	%	°C
PSR-333	15.0	73.0	11.1	0.2	0.17	0.1	0.1	0.30	0.15	2820	21	1745
PSR-315	13.0	68.0	18.0	0.13	0.10	0.05	0.01	0.30	0.14	3111	20	1775
PSR-333FG	15.6	69.0	13.6	0.79	0.32	0.05	0.04	0.32	0.09	2625	27	1745

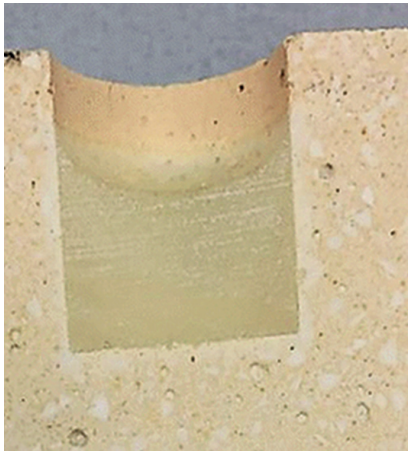
PSR-930, PSR-925 and PSR-311 – Special materials for feeder expendables.

PSR-311

- A slip cast high alumina material.
- Contains 91% Al_2O_3 and no ZrO_2.
- Recommended for tubes and plungers in sensitive applications where ZrO_2 can cause excessive seeding on initial installation.
- Commonly used in glass tableware production applications.

PSR-930

- Specially developed by our research and development department.
- High zirconia content of 24.9%.
- Very high density and very low porosity.
- Highly corrosion resistant with excellent thermal shock resistance.
- Specially developed for aggressive and long life feeder expendable applications.



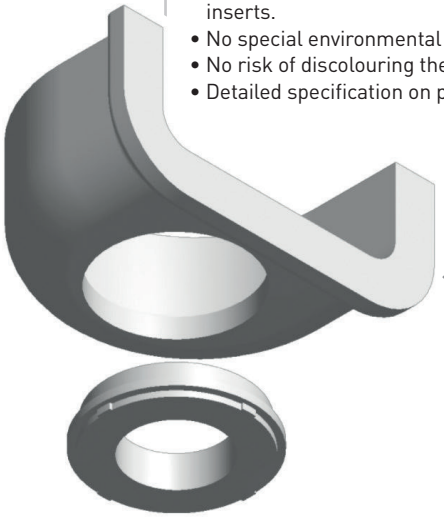
Sectioned static cup test for PSR-930 illustrating no penetration of glass at the glass/refractory interface.

	SiO_2	Al_2O_3	ZrO_2	Fe_2O_3	TiO_2	CaO	MgO	Na_2O	K_2O	Bulk density	Apparent porosity	Refractoriness
	%	%	%	%	%	%	%	%	%	KG m^{-3}	%	°C
PSR-930	12.8	61.8	24.9	0.06	0.09	0.04	0.01	0.1	0.1	3380	13	1775
PSR-925	0.15	74.0	24.1	0.03	0.04	1.06	0.05	0.13	0.01	3410	17-18	1804
PSR-311	8.0	91.0		0.12	0.40	0.06	0.08	0.39	0.17	2635	27	1810

PSR Spout inserts.

PSR-925 Spouts and spout inserts.

- Specially developed by our research and development department.
- Unique formulation with no SiO_2 content. Contains only ZrO_2 and Al_2O_3.
- A long life spout and spout insert material under test conditions.
- Specially recommended for use as a one-piece uninserted spout with no joint for the insert.
- A cost effective alternative to chrome oxide spout inserts.
- No special environmental considerations.
- No risk of discolouring the glass.
- Detailed specification on page three.



Inserted spout.

Chrome-oxide Spout inserts.

- Typically 94% Cr_2O_3.
- Suitable for extended long life in all glass container applications.
- Manufacture and disposal of Cr_2O_3 requires special environmental consideration.
- Can discolour the glass with a green tint.

Accessory parts.

PSR Preforms.

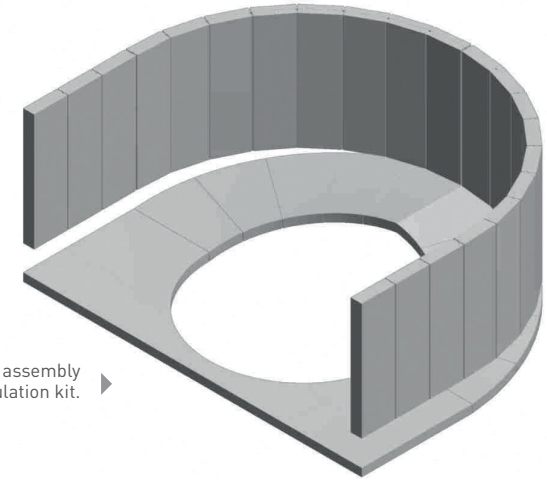
- Preformed modular insulation for orifice rings.
- Manufactured from body soluble earth silicate wools.
- Suitable for use up to 1200°C.
- Manufactured to fit the exterior profile of the orifice ring and the interior profile of the orifice ring holder.

PSR Gaskets.

- Installed between the spout and the orifice ring.
- Manufactured from body soluble earth silicate wools.
- Suitable for use up to 1200°C.
- Available in soft and hard grades according to preference.

PSR Spout insulation kits.

- Clean and energy efficient alternative to traditional spout insulation.
- Manufactured from microporous insulation panels and encased in glass cloth
- Rated at up to 1000°C.
- Available in single or double layers.



Typical assembly of single layer spout insulation kit.