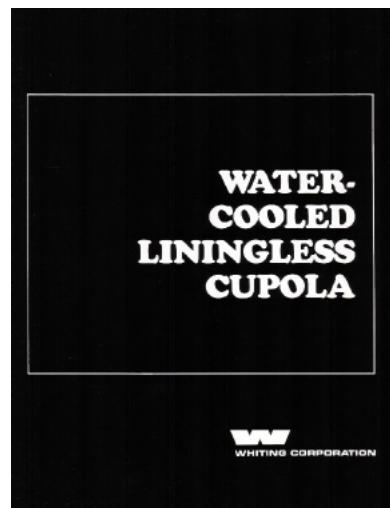




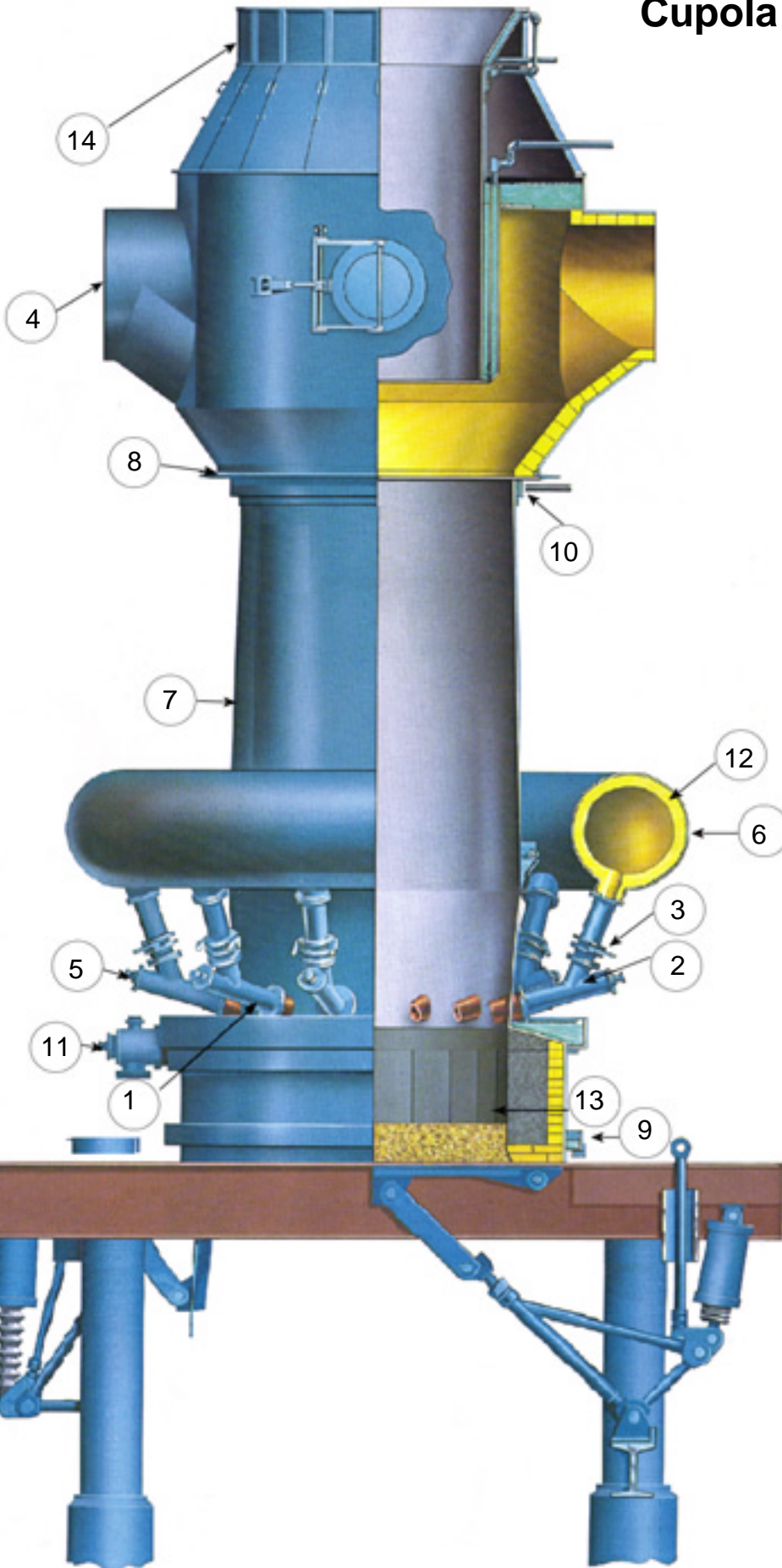
**Whiting Equipment Canada Inc.  
Water Cooled Liningless Cupola**

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# Water-Cooled Liningless Cupola

## Cupola Features...



1. Water-cooled tuyeres enter into the cupola at a downward angle. The tuyere diameter is sized for proper blast velocity at normal to maximum melting rates. Inserts may be used to provide proper velocity at lower blast rates.
2. Tuyere elbows are designed for convenient use of nozzle inserts with minimum pressure loss.
3. Control dampers in the tuyere down-comers provide flexibility in operation.
4. Unique gas take-off design provides uniform non-bridging flow of charge materials and allows for differential expansion of the inner annular ring.
5. Dual glass sight port in tuyere assembly.
6. Detached windbox facilitates inspection of water flow pattern, provides easy access to shell area for making adjustments to water flow.
7. All-welded body section may be straight or slightly tapered. The shell is scale free and welds are ground to promote smooth water flow. Reverse taper body configuration promotes longer shell life.
8. Dry bellows-type expansion joint provided between gas take-off and water-cooled section.
9. The offset well is cooled independently from the main cupola body.
10. Upper channel-type spray ring to supply shell cooling water, with lower re-distribution ring to apply to reverse taper.
11. Overflow spout with sight port into cupola well permits temperature and pressure measurement.
12. Internally lined windbox with relief vents. Simpler construction and less maintenance.
13. Carbon lining in well section
14. The upper stack is independently supported.

# Whiting's New Water-Cooled Liningless Cupola

For years Whiting Corporation has been providing water—cooled liningless hot blast cupolas for the foundry industry to suit many different applications and special customer requirements.

Whiting has initiated several new developments and improvements to its water—cooled cupolas which have proven successful in actual operation and which are described below:

## **New, Simpler Design Shell Cooling Water Ring**

A single channel arrangement (see illustration) without tubes to adjust or clog. Only one ring is required for proper cooling thus eliminating the additional spray rings with their associated piping and maintenance.

## **Reverse Taper Body Configuration**

Extends shell life by increasing the shell diameter at the high heat area above the tuyeres similar to proven design used for years in larger blast furnaces. Design promotes some skulling above the tuyeres which acts as insulation to keep heat inside the cupola and reduce losses through the shell. A water ring is required at the reverse taper to redistribute the cascading shell cooling water. Additional cooling water can be added at this ring, but it is normally not required. (See illustration.)

## **Dry Bellows-Type Expansion Joint**

Thin gauge material with gasket and bolts provides a simple design which minimizes the possibility of gas leaks from shell warpage (see illustration). This arrangement gives a gas-tight seal between the water-cooled body and gas take-off without potential water leaks into the cupola.

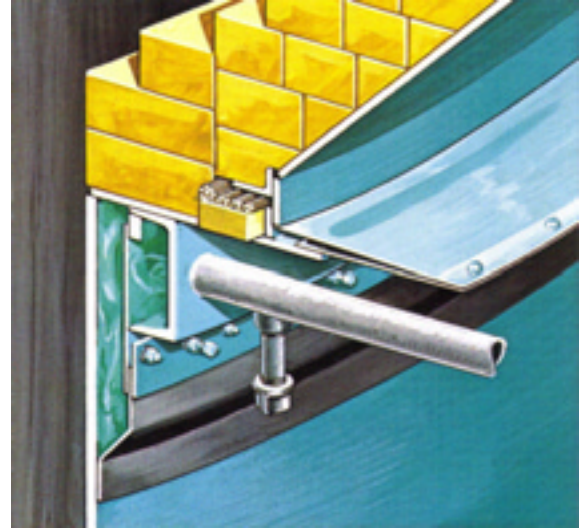
## **Internally Lined Windbox**

Utilization of a lightweight refractory with a high insulating value provides a significant reduction in initial cost due to the elimination of the need for stainless steel material (see illustration). Internal lining also avoids repairs and replacement of the conventional external insulation which often deteriorates. Another substantial benefit is the elimination of many expansion problems and expansion joints. Supports for the windbox are also simpler without the expansion problems. Customers using this type of windbox are extremely satisfied with the performance.

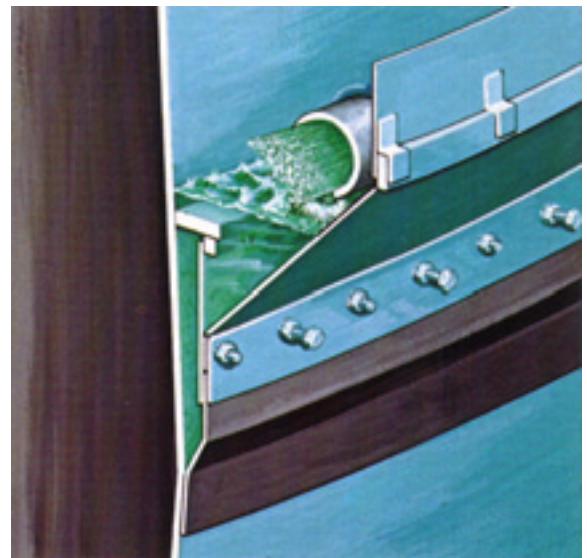
## **Below Door Gas Take-Off**

Specially designed water-cooled inner annular ring with support arrangement allows for differential expansion to minimize any possible water leaks caused by cracking. Water inlets are designed to promote high velocity and agitation to minimize buildup with subsequent hot spots and water leaks.

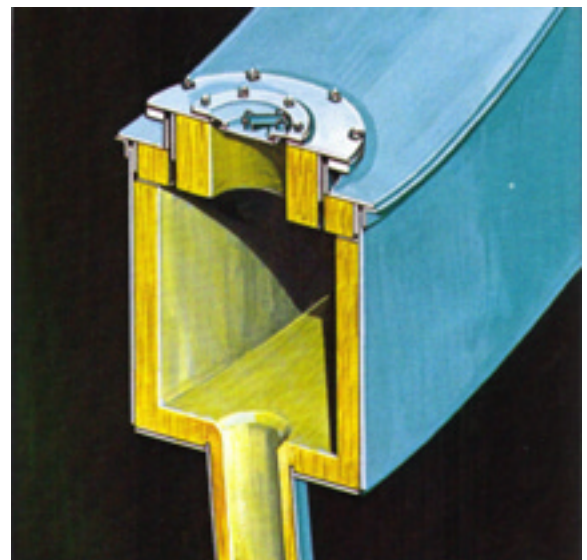
Let one of Whiting's engineers explain how these improvements can help you. Ask him about our recuperative hot blast systems. Let us demonstrate to you that Whiting is the leader in cupola technology. Call us at (+1) 800-407-3384.



Channel-type water ring with adjustable neoprene wiper for even distribution of cooling water on cupola shell. Dry-type expansion joint allows movement while sealing cupola gases.



Redistribution water ring to direct cooling water onto the reverse taper.



Internally lined windbox with vent valve and inspection cover reduces initial cost and eliminates many maintenance problems.

- **Rail/Rapid Transit Maintenance Equipment** car progression and repair systems, turntables, washers, jacks
- **Chemical Process Equipment** including Swenson evaporators, crystallizers, dryers
- **Metallurgical Equipment** complete melt shop equipment from Electric arc furnaces to ladles
- **Material Handling** light to heavy duty cranes, roller, Belt and telescopic conveyors
- **Trackmobile®** bi-modal transport system providing an efficient and economical means of switching railcars within industrial plants and railroad terminals.

## Whiting Equipment Canada Inc.



[www.whiting.ca](http://www.whiting.ca)

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