URC | UNITED REFRACTORIES CO. DELIVERS

40 YEARS OF PERFORMANCE DESIGNED SOLUTIONS

APPLICATION: **IRON FOUNDRY / CUPOLA** LOCATION: **MIDWEST USA**

BACKGROUND

Operators running a cupola producing grey iron at 70 tons/hour (24 hrs/day) want to increase run times and lower costs. An analysis of the process found that a "veneering maintenance program" using high-tech gunning mixes accomplishes both goals.

UNITED APPROACH

Product

The foundation of a successful veneering program is a set of gunite mixes with the following characteristics:

- **Excellent Strength:** Both UNI-GUN RF-70 RG and UNI-GUN LC-452 SC are low cement compositions with good hot strengths at temperature, thereby maintaining the profile of the lining between applications.

	Cupola Lining	Veneering Gun Mix
Upper Stack	High Al_2O_3 Brick	UNI-GUN RF-70 RG
Melt Zone	UNI-SHOT 88SC	UNI-GUN LC-452 SC

- **A "Sticky Gunnability":** Both products are designed to adhere to the substrate and fill in the irregular, worn-out areas back to profile thickness with minimal rebounds.
- **Consistent Flow and Application:** A major goal of the veneer program is to minimize furnace downtime. The URC low cement veneer products are very consistent, resulting in ease of gunning, an uninterrupted application and an overall fast turnaround.

Process

The veneering process is as follows:

- Approximately every two weeks, the gun mixes are used to bring the original lining back to profile thickness.
- Usually a team of 2-3 workers install the product.
- On average, thicknesses are as follows:
  -Stack: UNI-GUN RF-70 RG 2-3"
  -Melt zone: UNI-GUN LC-452 SC 3-4"
- No special air cure is used, and the dry out process is accomplished within the cupola start-up.

DELIVERED VALUE

Although all cupolas have a specific set of conditions and maintenance procedures, performance goals affecting furnace efficiencies, efficient coke usage and maximized refractory life are targets for most operators. Maintaining a cupola melt zone and upper stack at this account reduces refractory costs and increases furnace capacity, thereby making a huge impact on the profitability of the plant.

No Veneer Program

Original Lining Cost (complete reline every 3 months)

			Down days due to refractory/year
Material	$72,000		
Construction Labor	+ 8,000		
Dryout	+ 5,000		9-12 days
	$85,000	x 4 times/year = $340,000	

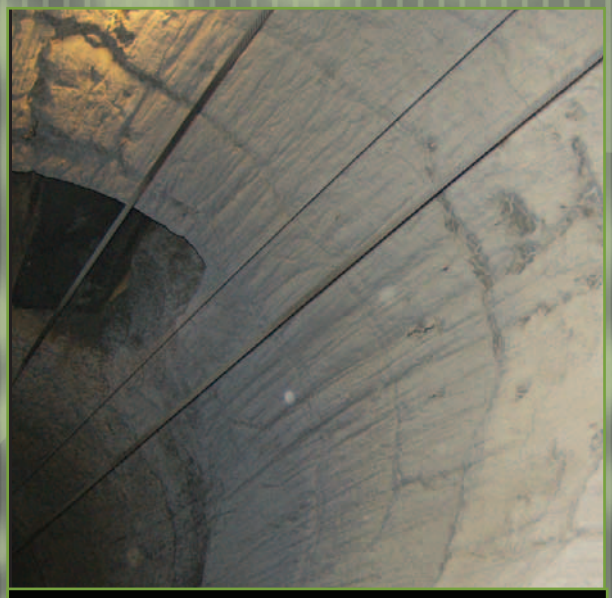
With Veneer Program

Lining Cost with Veneered Program (complete reline once/year)

$56,000	Material gunned (over 3 months) x 3	$168,000	4-6 days
$85,000	1 Complete reline	+ 85,000	
		$253,000	

TOTAL DELIVERED IMPACT= $87,000 + $2,750,000
(Material/labor savings) (Furnace availability*)

*Approximate value of daily furnace availability = $500,000/day.



Prior to the veneering process, the original lining should be free of most debris and worn refractory. This is an example of an excellent clean up prior to gunning.

HIGH PERFORMANCE MELT ZONE GUN MIX

The hostile environment of the melt zone demands both resistance to extreme temperature and a high K factor to work in concert with the base lining. UNI-GUN LC-452 SC has these properties, as it helps freeze the slag to maximize integrity of the system, thereby maximizing coke savings.

The cupola veneering process takes place in tight quarters, making the excellent gunnability and "sticky nature" of the UNI-GUN low cement mixes critical features for success.

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