



13-15 September / Eylül 2012, Tüyap, İstanbul

6th International Ankiros Foundry Congress
6. Uluslararası Ankiros Döküm Kongresi



**Bu bildiri 6. Uluslararası Ankiros Döküm
kongresinde sunulmuştur**

**This paper was presented on 6th Ankiros
Foundry Congress**

<http://kongre.tudoksad.org.tr/>

Eylül 2012
September 2012
Tüyap, İstanbul

6th International Ankiros Foundry Congress

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Improved Sand Reclamation for All Foundries



SAND RECLAMATION

WHY RECLAIM?

- Cost Savings
- Reduce Impact on the Environment
- Improved Sand Characteristics
- Improved Casting Quality

RECLAMATION REQUIREMENTS

- To reduce the lump sand to grain size
- To remove coarse and fine particles
- To remove as much as possible of the resin bonding the sand
- To cool the sand sufficiently for re-use

OPTIONS

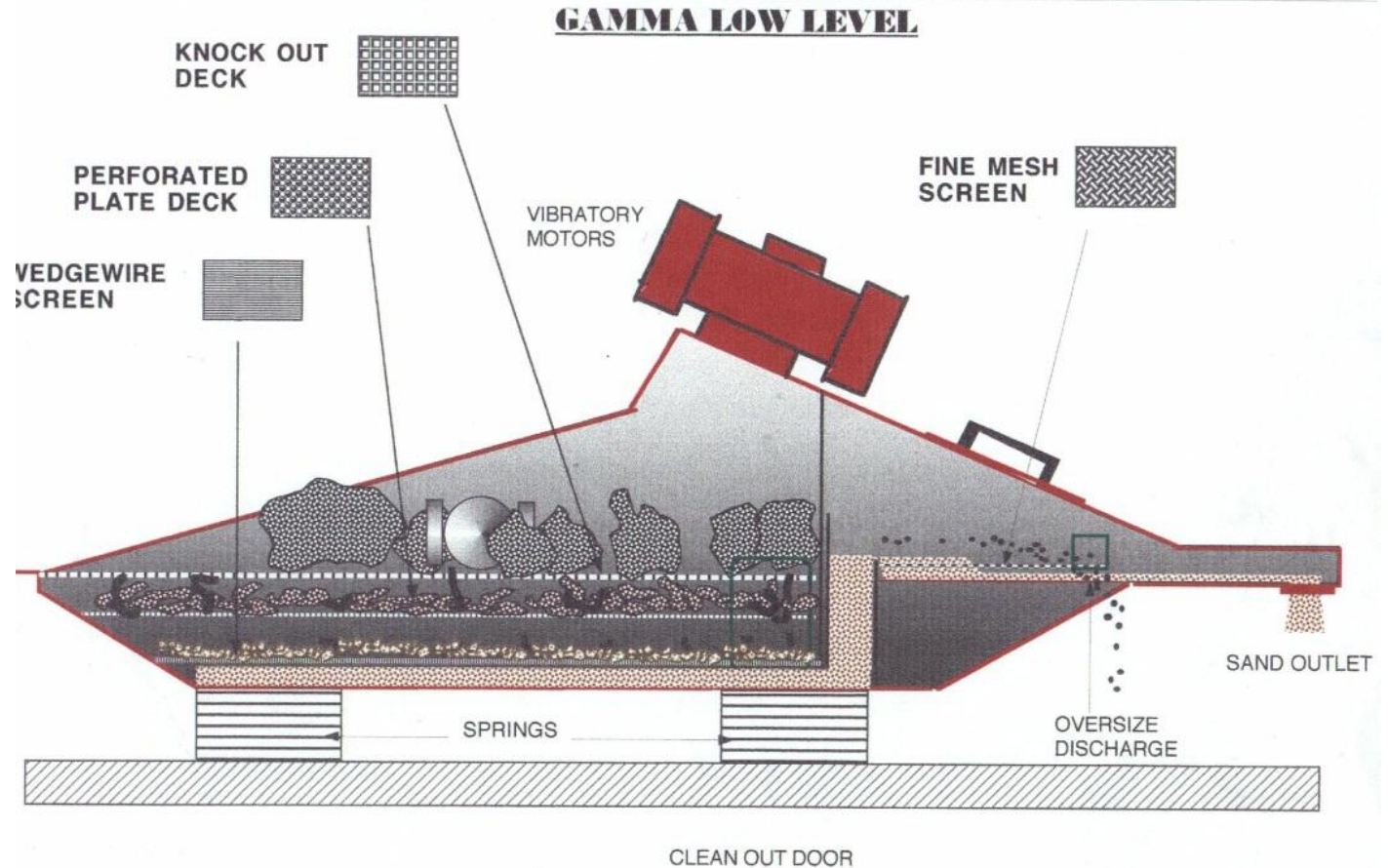
- Shake-Out/Primary Attrition
- Secondary Attrition
- Thermal



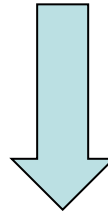
Low Level Attrition Unit



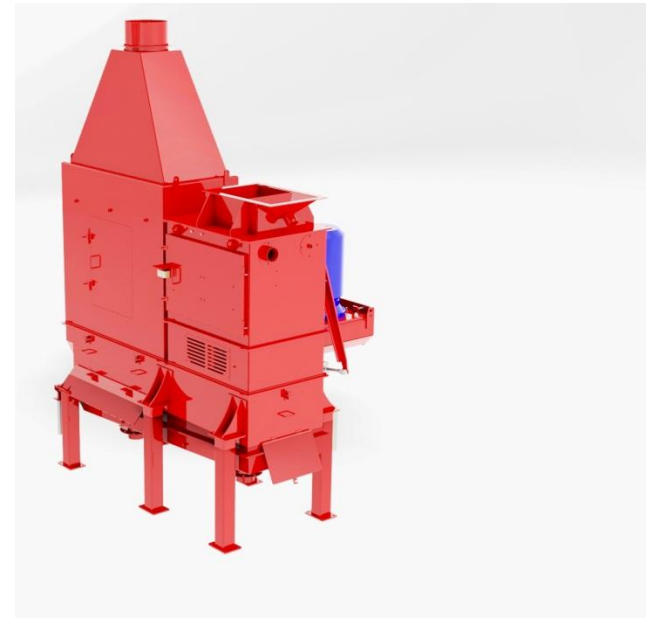
Primary Attrition Unit



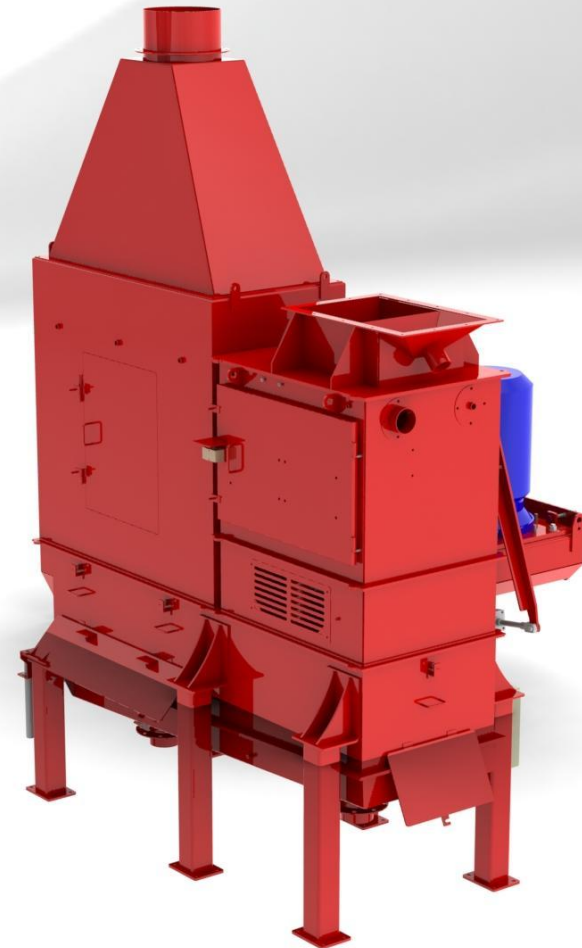
For Further Binder Reduction We Have a Choice



Thermal Reclamation



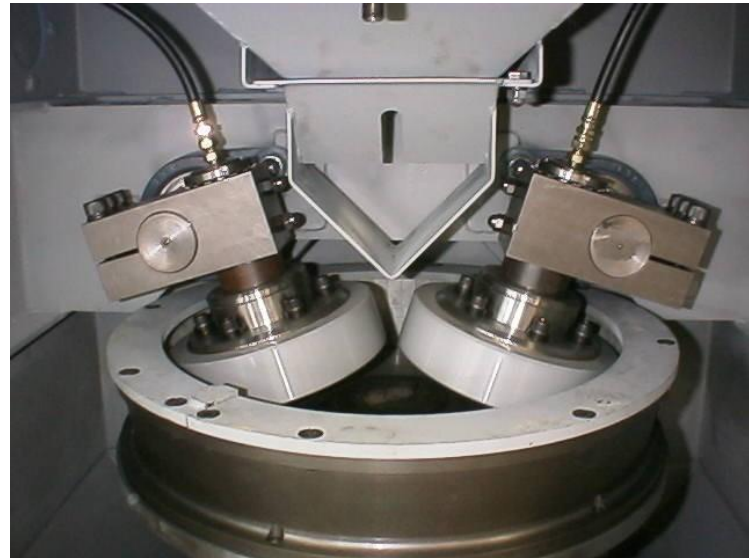
Secondary Attrition



'USR' SECONDARY ATTRITION UNIT

Secondary Attrition Advantages

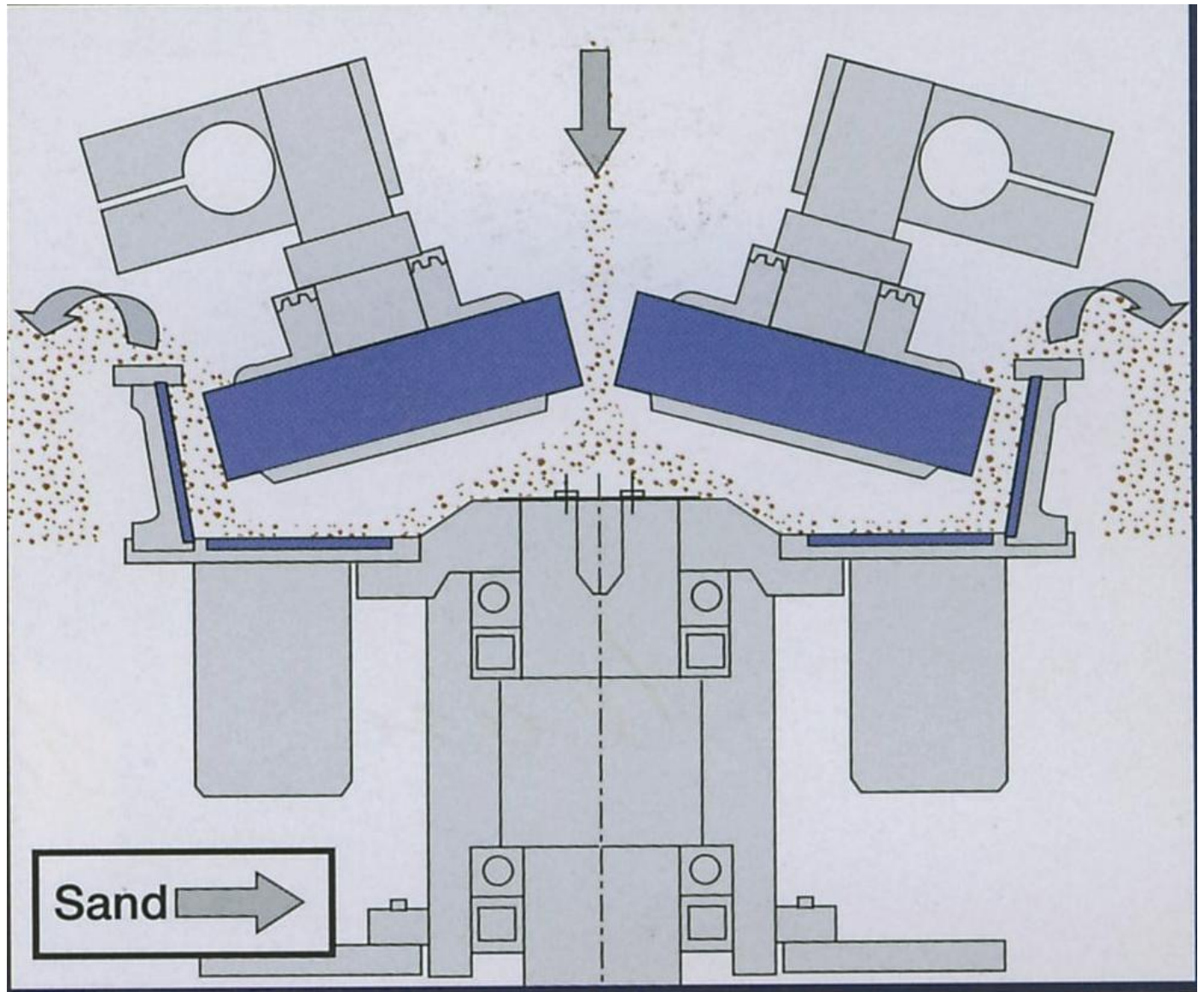
- Suitable for In-Organic binders such as Silicates
- Also Semi-Inorganic Binders such as Alkaline Phenolic's
- Further reduce residual surface binder and hardener
- Have L.O.I's closer to that of reclaimed Furan
- Lower investment cost than Thermal



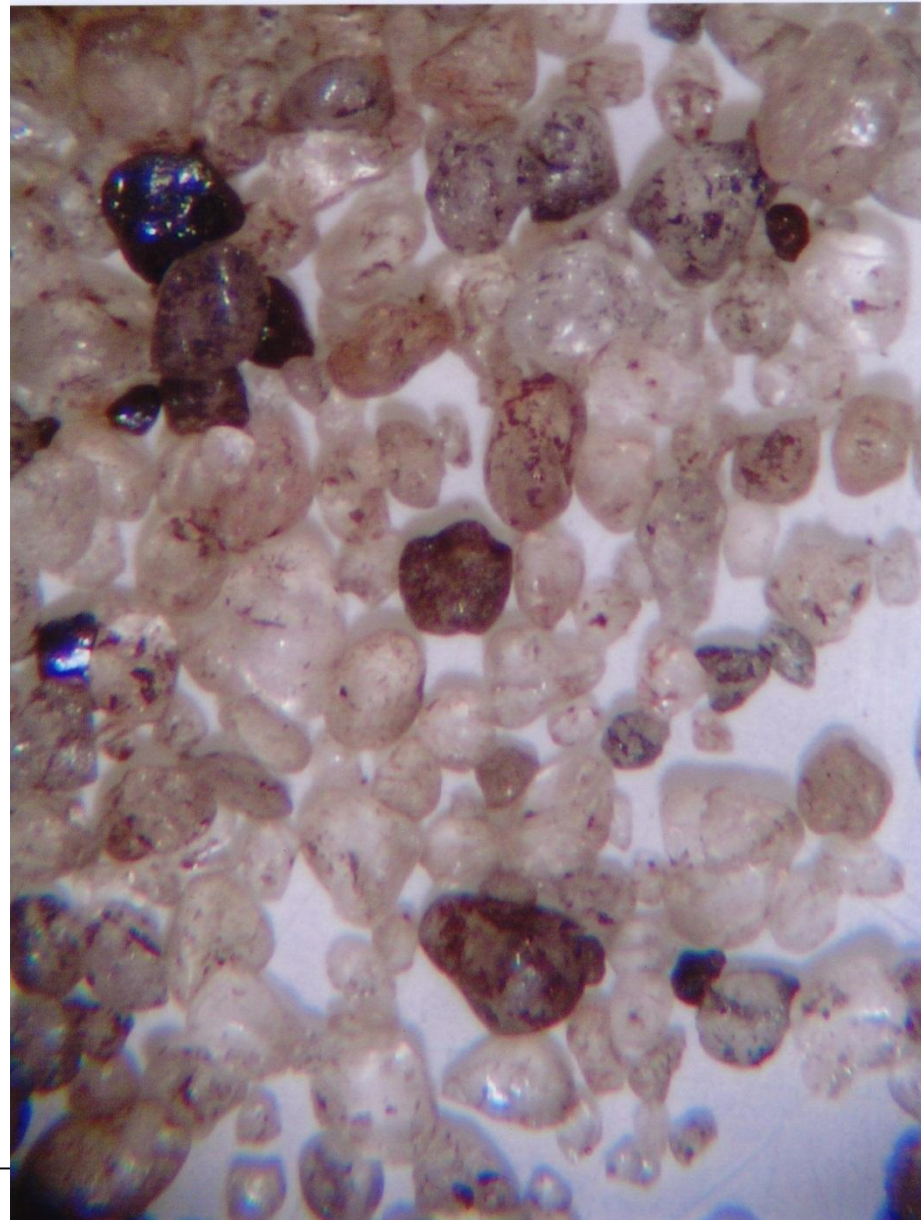
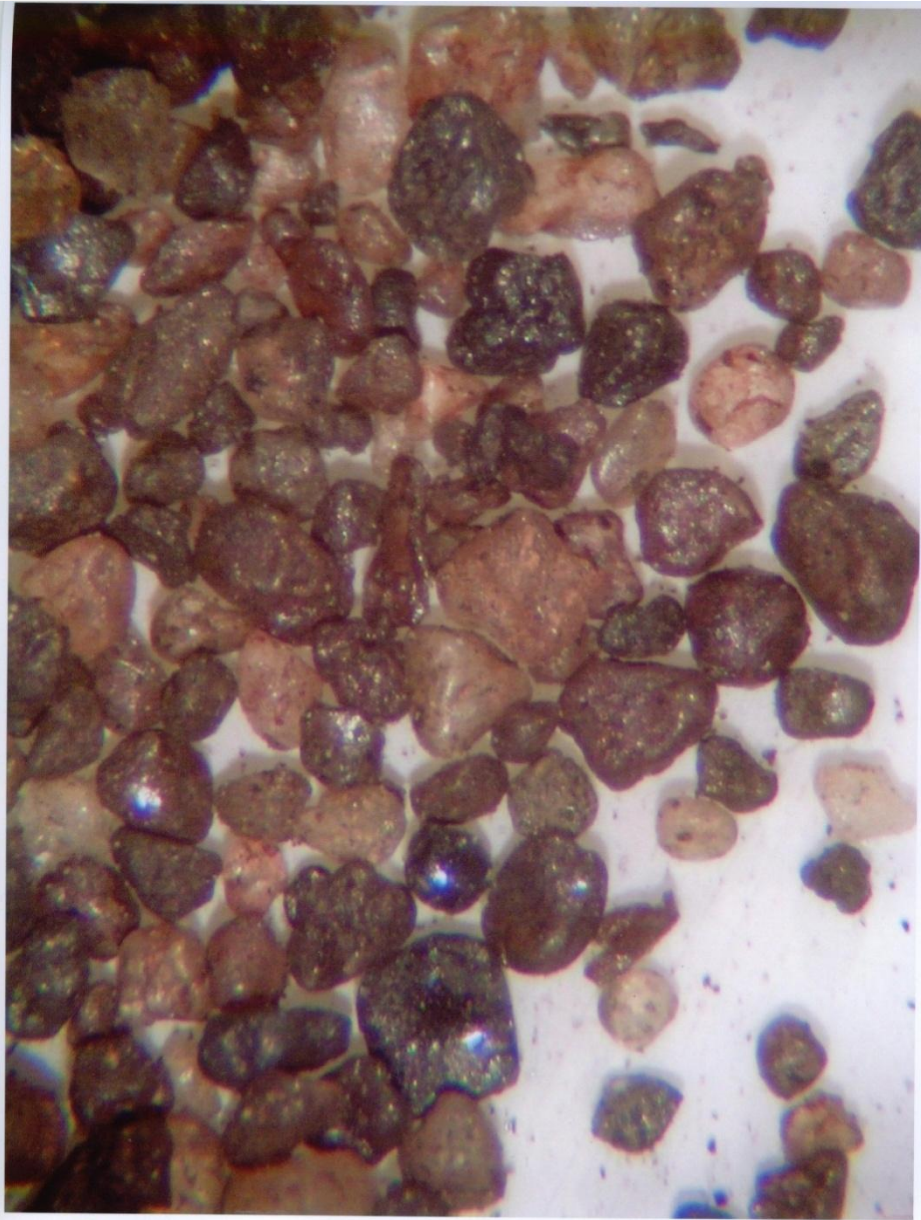
Scrubbing Unit



Fluidised Bed



Alkaline Phenolic – Before & After



Sand as Received

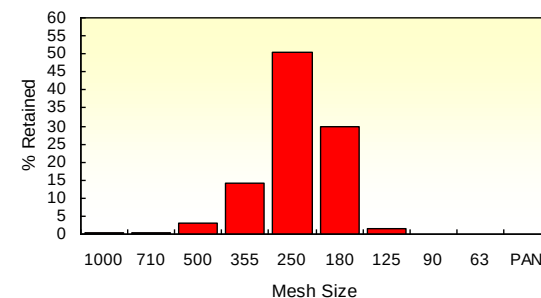
SAND ANALYSIS REPORT



FOUNDRY NAME :	J T Price	FOSECO REFERENCE	06-100
SAND TYPE :	Reclaim 100 %	SAMPLE POINT :	JT price
BINDER SYSTEM :	FENOTEC 260	SAMPLE DATE :	19-Oct-06
PREPARED BY :	M Bradley	REPORT DATE :	24-Oct-06

SIEVE ANALYSIS :-

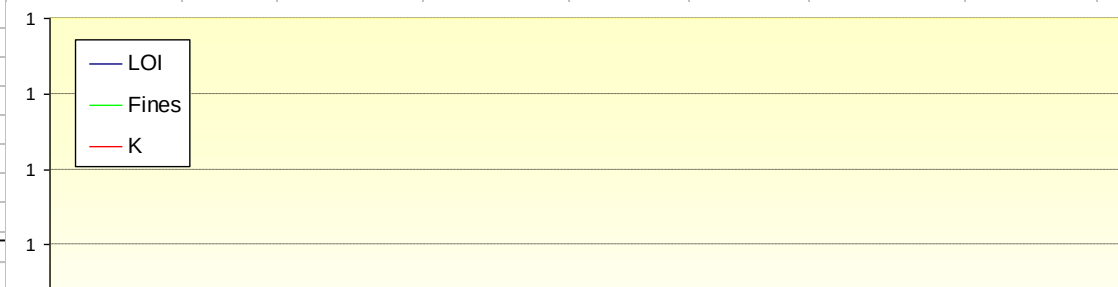
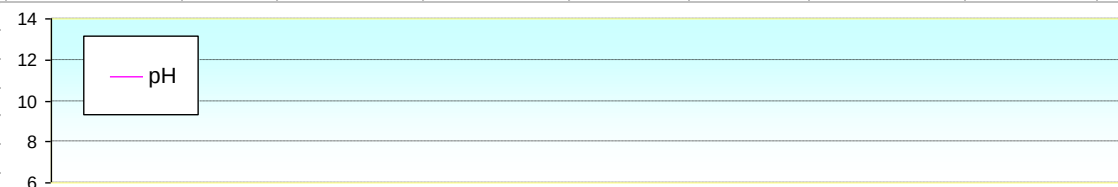
Mesh Size	% Retained
1000	0.50
710	0.48
500	3.01
355	14.12
250	50.53
180	29.66
125	1.55
90	0.12
63	0.04
PAN	0.00



CHEMICAL ANALYSIS

		Low Limit	High Limit			Low Limit	High Limit
Loss on Ignition	2.22%	0.80%	2.00%	AFS	46	44	56
Potassium	0.16%	0.05%	0.20%	FINES	1.67%	0.00%	5.00%
Moisture	0.63%	0.00%	0.90%	DUST	0.04%	0.00%	0.50%
pH	10.28	9.70	11.00				

TRENDS :-



SAND ANALYSIS REPORT

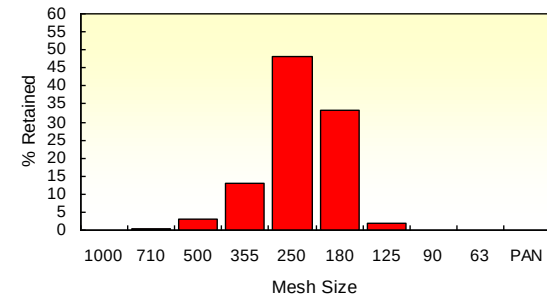


FOUNDRY NAME :	J T Price	FOSECO REFERENCE	06-101
SAND TYPE :	Reclaim 1st Pass	SAMPLE POINT :	Omega Unit
BINDER SYSTEM :	FENOTEC 260	SAMPLE DATE :	19-Oct-06
PREPARED BY :	M Bradley	REPORT DATE :	24-Oct-06

Sand After 1 Pass

SIEVE ANALYSIS :-

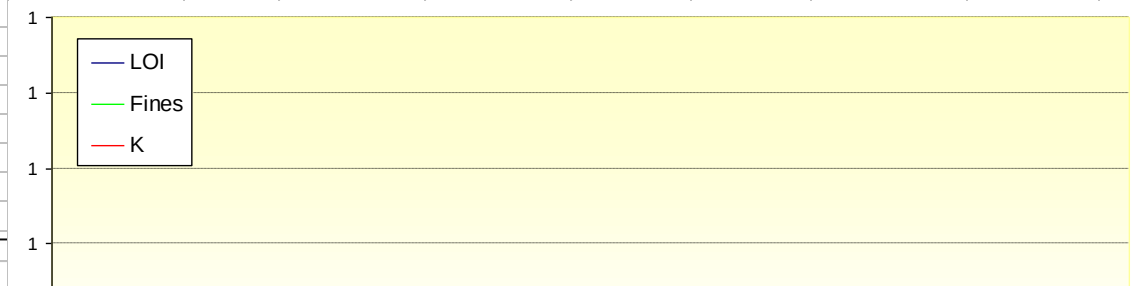
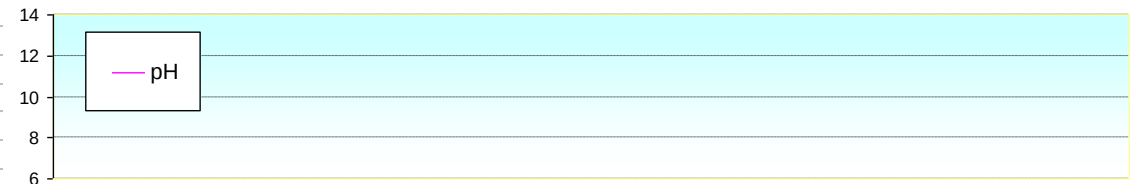
Mesh Size	% Retained
1000	0.12
710	0.36
500	2.93
355	12.89
250	48.26
180	33.30
125	2.08
90	0.06
63	0.00
PAN	0.00



CHEMICAL ANALYSIS

		Low Limit	High Limit			Low Limit	High Limit
Loss on Ignition	0.91%	0.80%	2.00%	AFS	48	44	56
Potassium	0.10%	0.05%	0.20%	FINES	2.13%	0.00%	5.00%
Moisture	0.19%	0.00%	0.90%	DUST	0.00%	0.00%	0.50%
pH	10.17	9.70	11.00				

TRENDS :-



Sand After 2 Passes

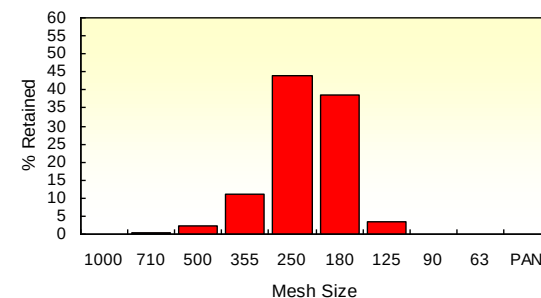
SAND ANALYSIS REPORT



FOUNDRY NAME :	J T Price	FOSECO REFERENCE	06-102
SAND TYPE :	Reclaim 2nd Pass	SAMPLE POINT :	Omega Unit
BINDER SYSTEM :	FENOTEC 260	SAMPLE DATE :	19-Oct-06
PREPARED BY :	M Bradley	REPORT DATE :	24-Oct-06

SIEVE ANALYSIS :-

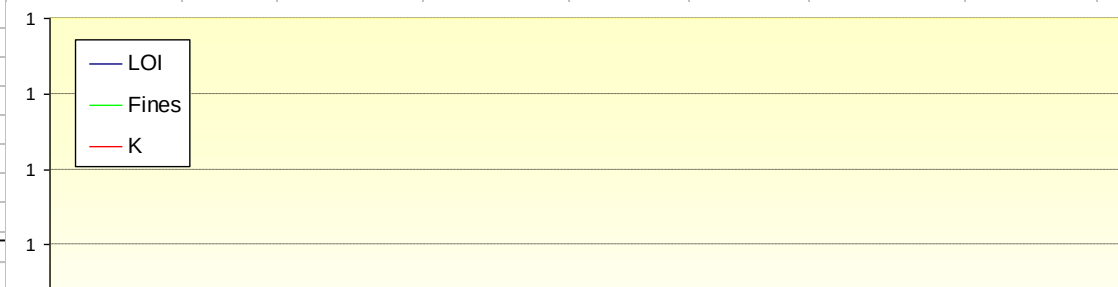
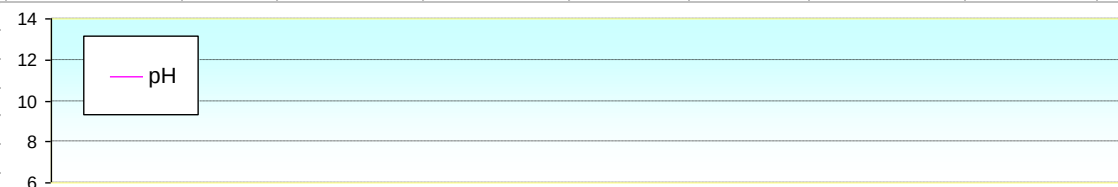
Mesh Size	% Retained
1000	0.06
710	0.26
500	2.35
355	11.05
250	43.99
180	38.70
125	3.43
90	0.16
63	0.00
PAN	0.00



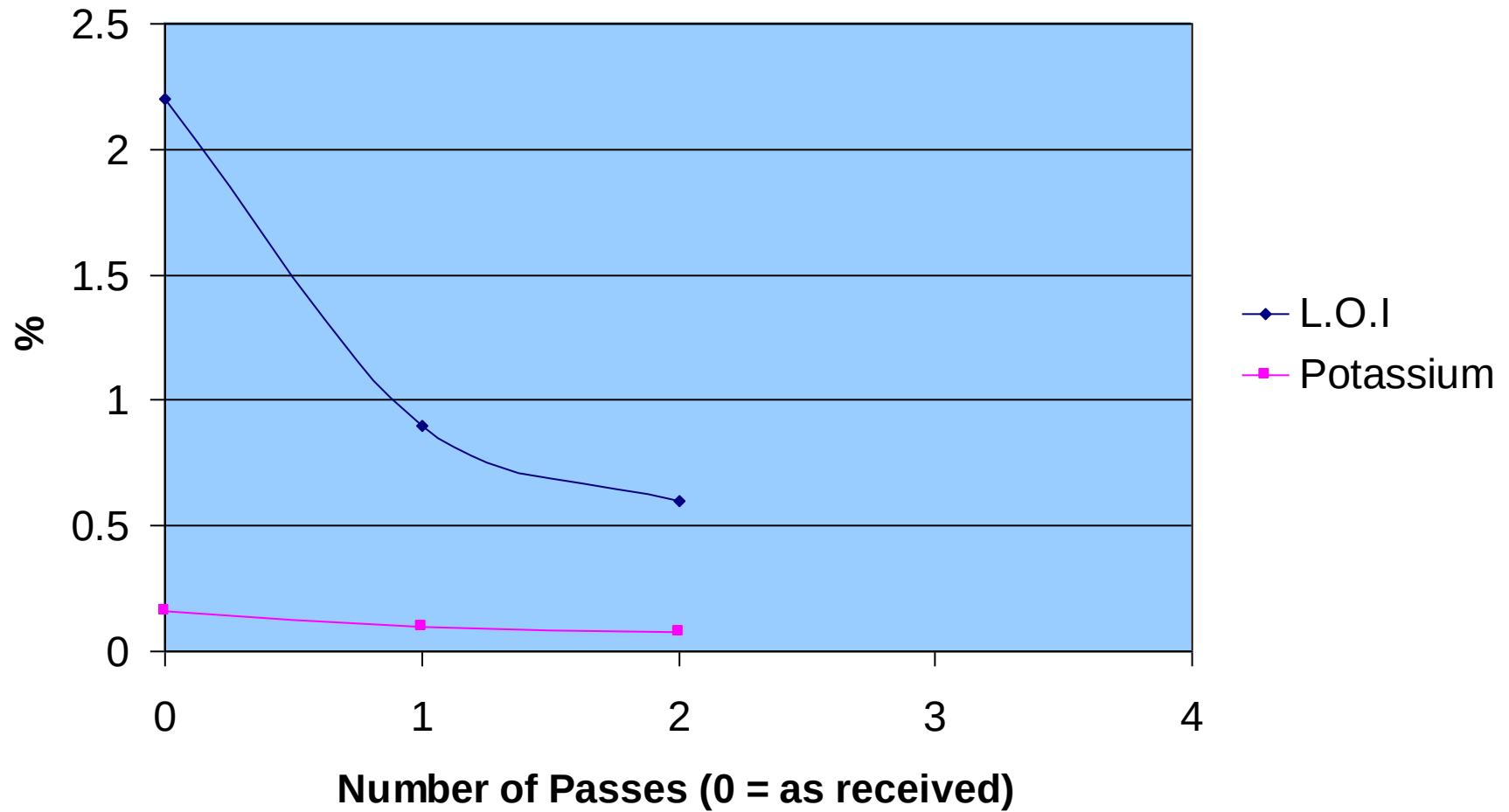
CHEMICAL ANALYSIS

		Low Limit	High Limit			Low Limit	High Limit
Loss on Ignition	0.60%	0.80%	2.00%	AFS	49	44	56
Potassium	0.08%	0.05%	0.20%	FINES	3.59%	0.00%	5.00%
Moisture	0.11%	0.00%	0.90%	DUST	0.00%	0.00%	0.50%
pH	10.16	9.70	11.00				

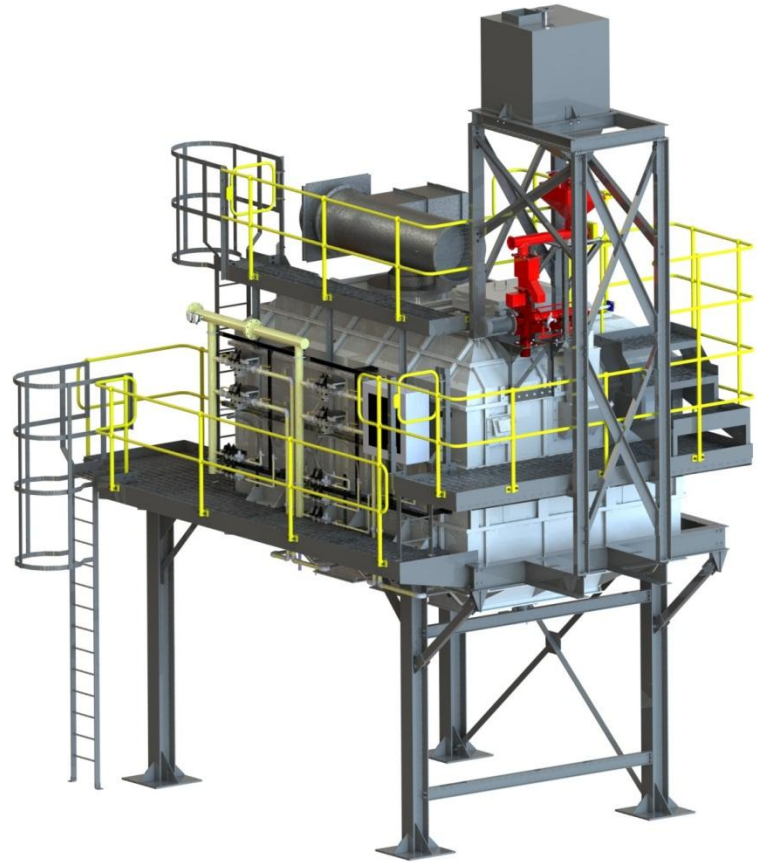
TRENDS :-



Alkaline Phenolic Reclaim Sand

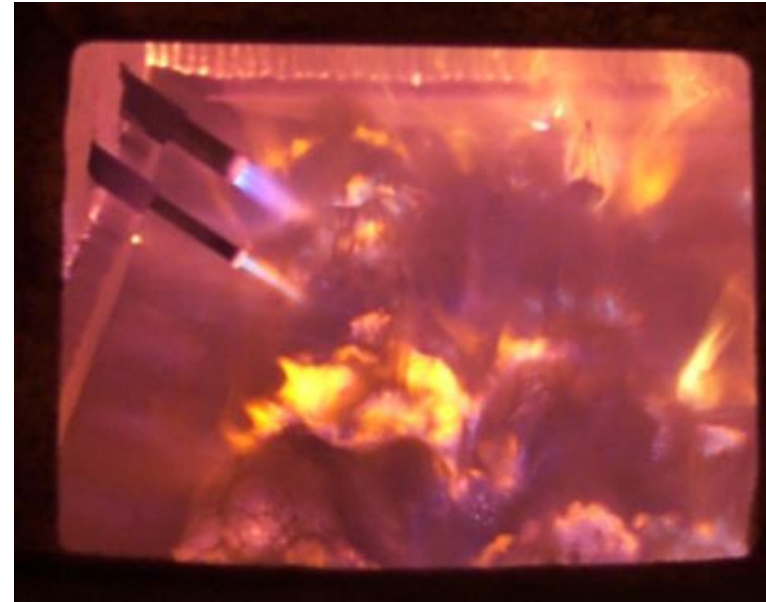


Thermal Reclamation



Thermal Advantages

- Sand is 100% Clean
- Thermally Conditioned
- Better than New
- More Efficient When Operated Continuously



Suitable for Thermal :-

Furan

Phenolic Urethane

Phenolic Ester

De-core sand from
greensand systems

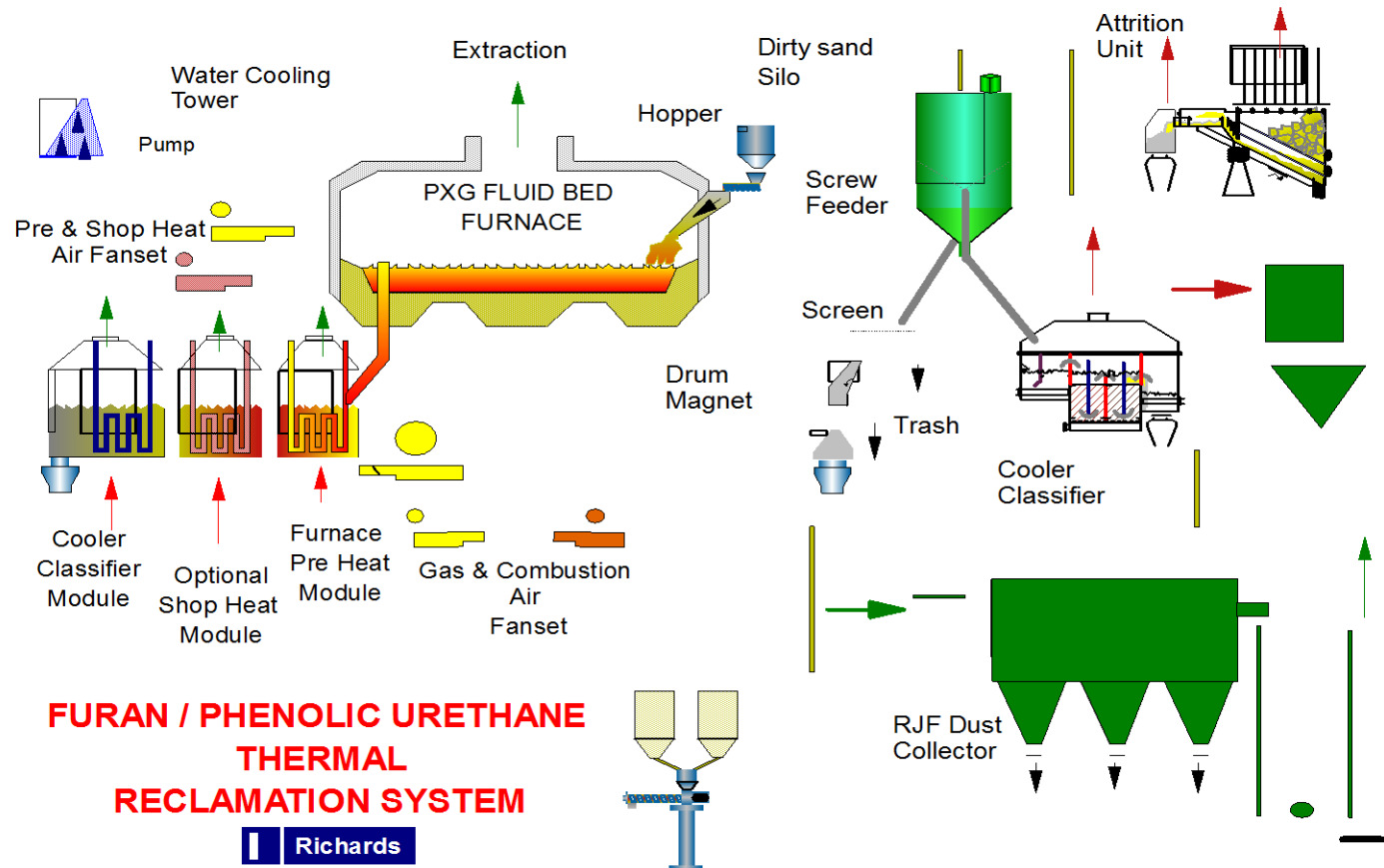
Die Casting sand core

Shell sand

100% Zircon moulds



Furan / Phenolic Urethane System

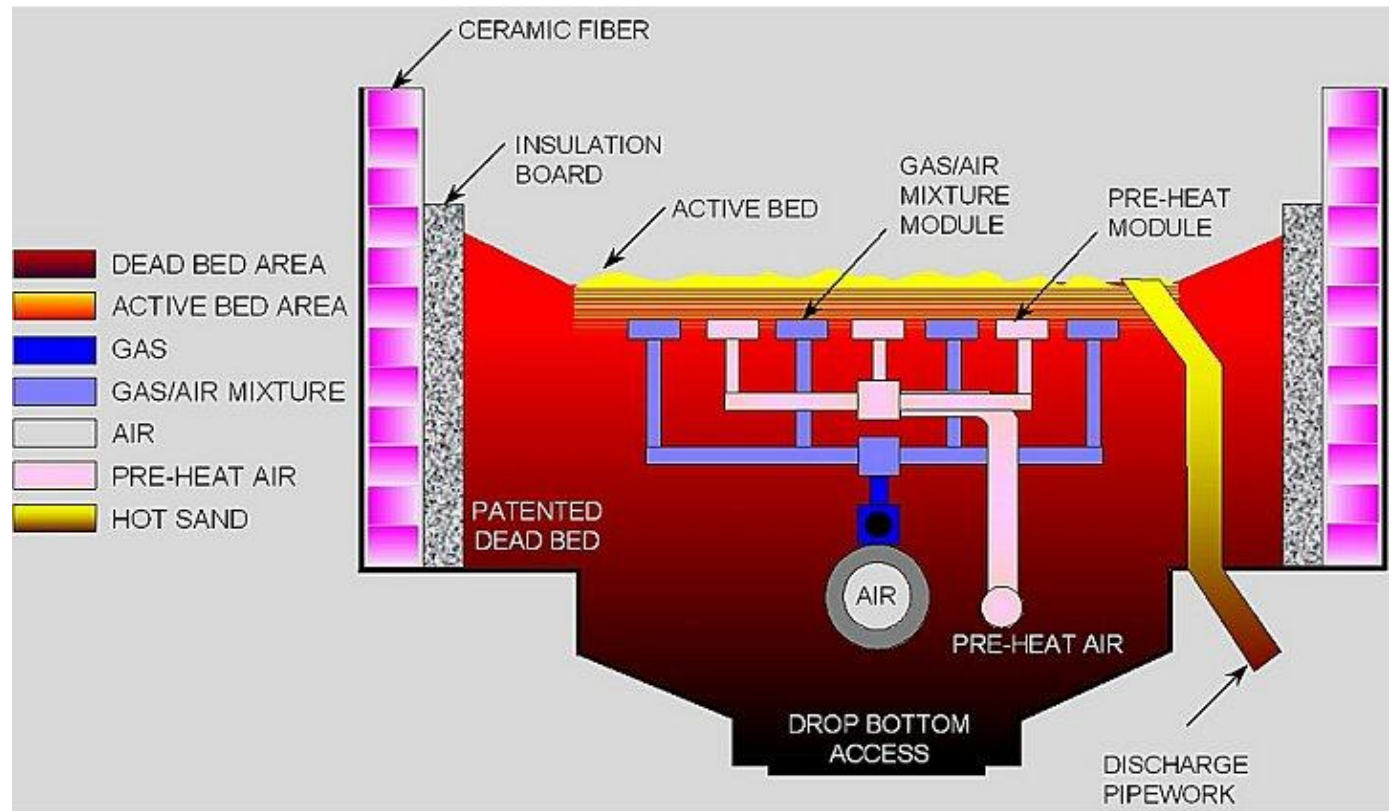


The Furnace



Fluidised Bed System
'Dead Bed' Design
Virtually No Maintenance

Three Levels of Insulation

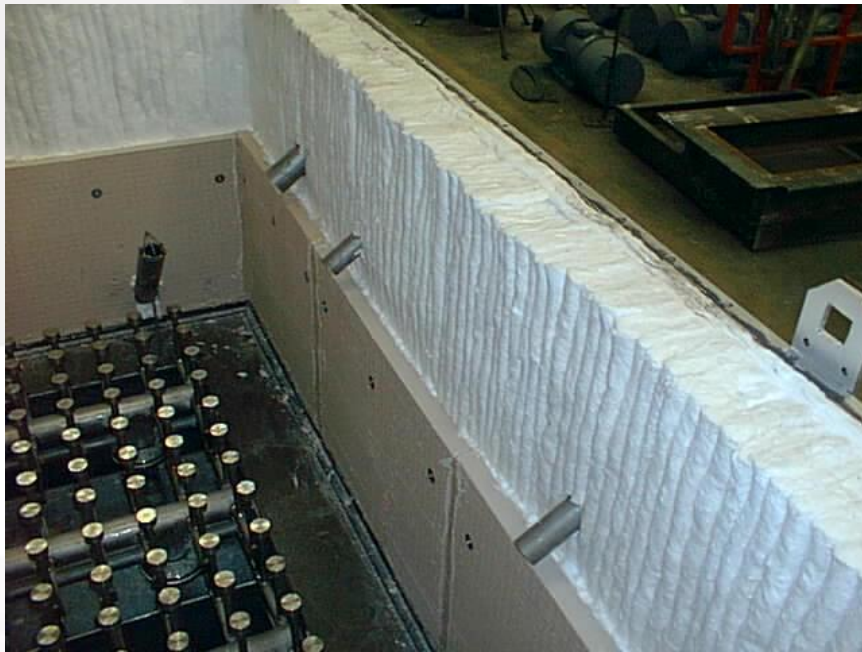




Gas Air Bubble Cap



Bubble Caps & Penetrations

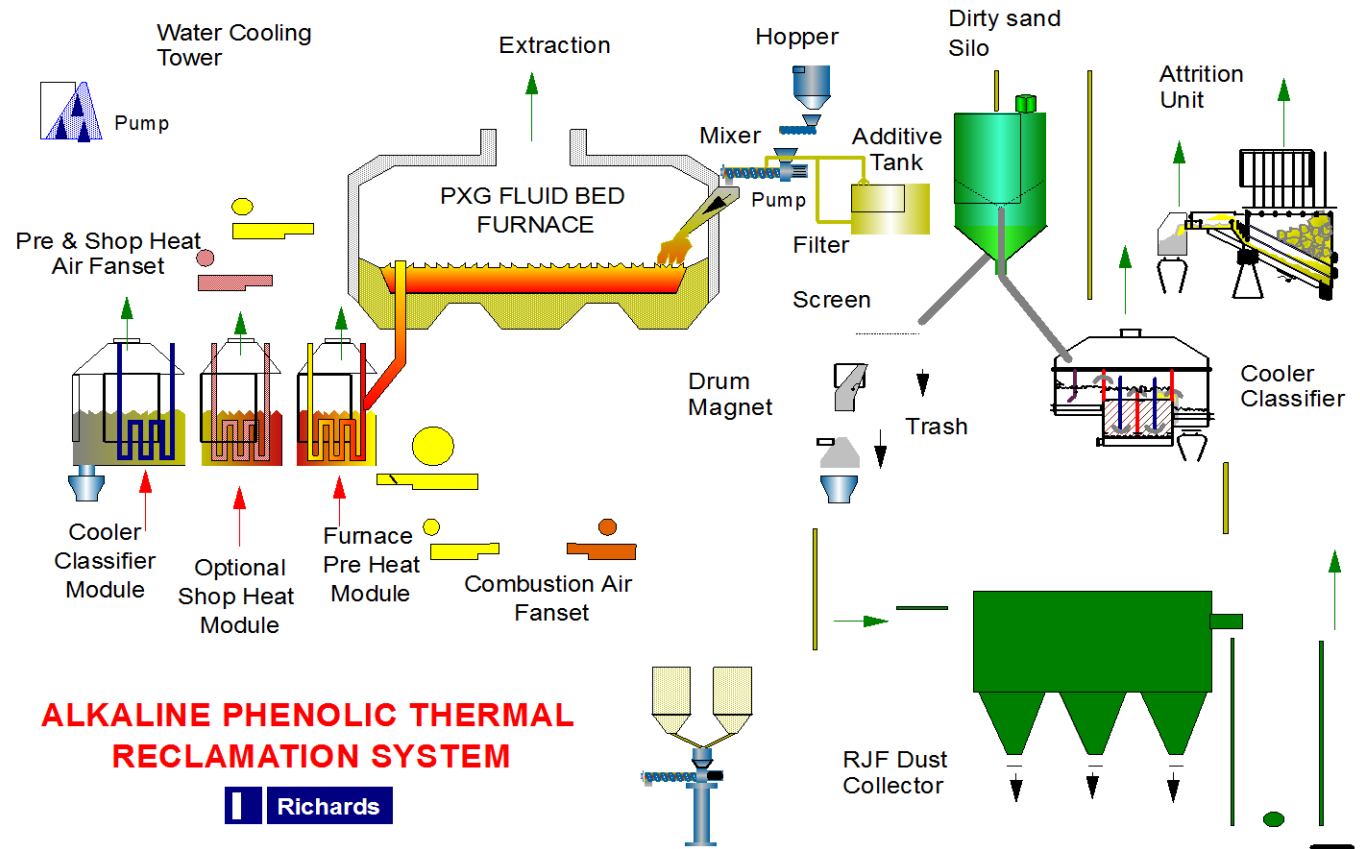


Heat Exchanger & Cooling





Alkaline Phenolic Systems



Alkaline Phenolic System

- Additive Bulk store
- Additive day tank
- Litre meter
- Peristaltic pump



Typical Thermal Utility Requirements

- Natural Gas: Approx 17m³ / tonne processed
- LPG Gas : 14 kg/tonne processed
- Electricity: Approx 40Kw / tonne
- Compressed Air: for dust collector & Pneumatic Conveyors

Conclusion

In-Organic Binder System – Secondary Attrition Only

All Others – Secondary or Thermal :-

- Level of investment
- Reduction in new sand purchasing
- Reduction in sand dumping

Omega Foundry Machinery Ltd

Thank You



Committed to the Foundry Industry

