

ASHLAND.

Advancements in No Bake Binders Technologies

Joe Muniza
Global Marketing Manager - Binders
October 01, 2009



Updated 07/31/09

To promote the production and application of ductile iron castings



DUCTILE IRON SOCIETY

DIS Meetings - [DIS/ICRI Fall 2009 Joint Meeting](#)

Agenda

Factors Effecting the Foundry

New Product Technologies

Optimization of the process

Outside Factors Effecting Foundries

Customer Requirements



Loss of Expertise

Environmental

Local & Global Competition

Factors The Foundry Can Control

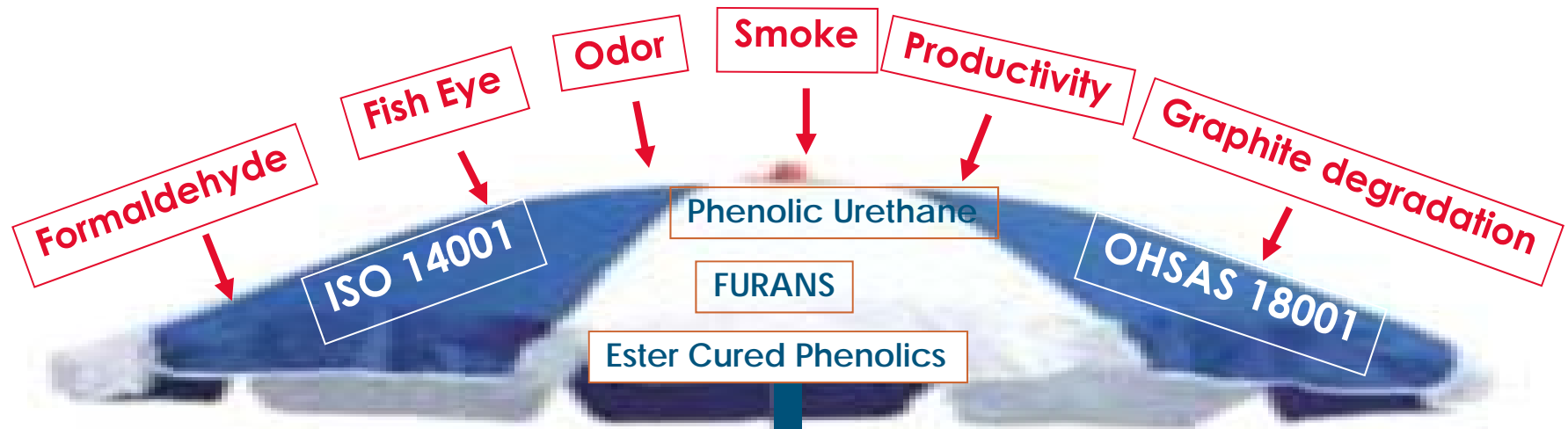


New Product Technologies

- **New To World Chemistry**
 - What, when & effectiveness level
- **No- Bake Binders**
 - Improvements with existing chemistry
 - Furan
 - Phenolic Urethane
- **Other Products**



Selecting the Best Product & Technology

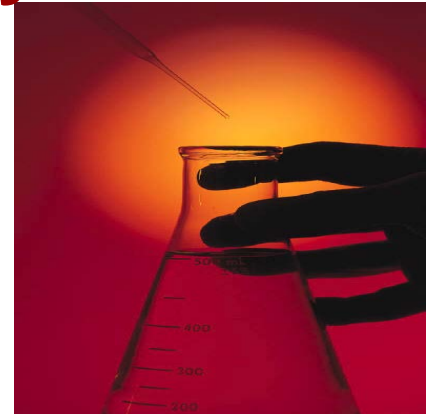


RESPONSIBLE CARE

Responsible Care

Attributes of New Furan Technology

- New furan acid cured technology
 - Application & solution focused
 - To meet specific metallurgical needs
 - To meet more stringent EH&S standards
 - A furan with reactive components & additives
- Improve the deficiencies in furan no-bake system
 - Worktime / Striptime ratio
 - Through-cure
 - Strength development post strip
 - Eliminated or reduced phenol / formaldehyde odors
 - 50% reduction in sulphur dioxide / pouring odors
 - Reduce sulphur related defects
 - Higher use of renewable resources
 - Combined with coatings for max performance



No-Bake Furan Environmental Technology

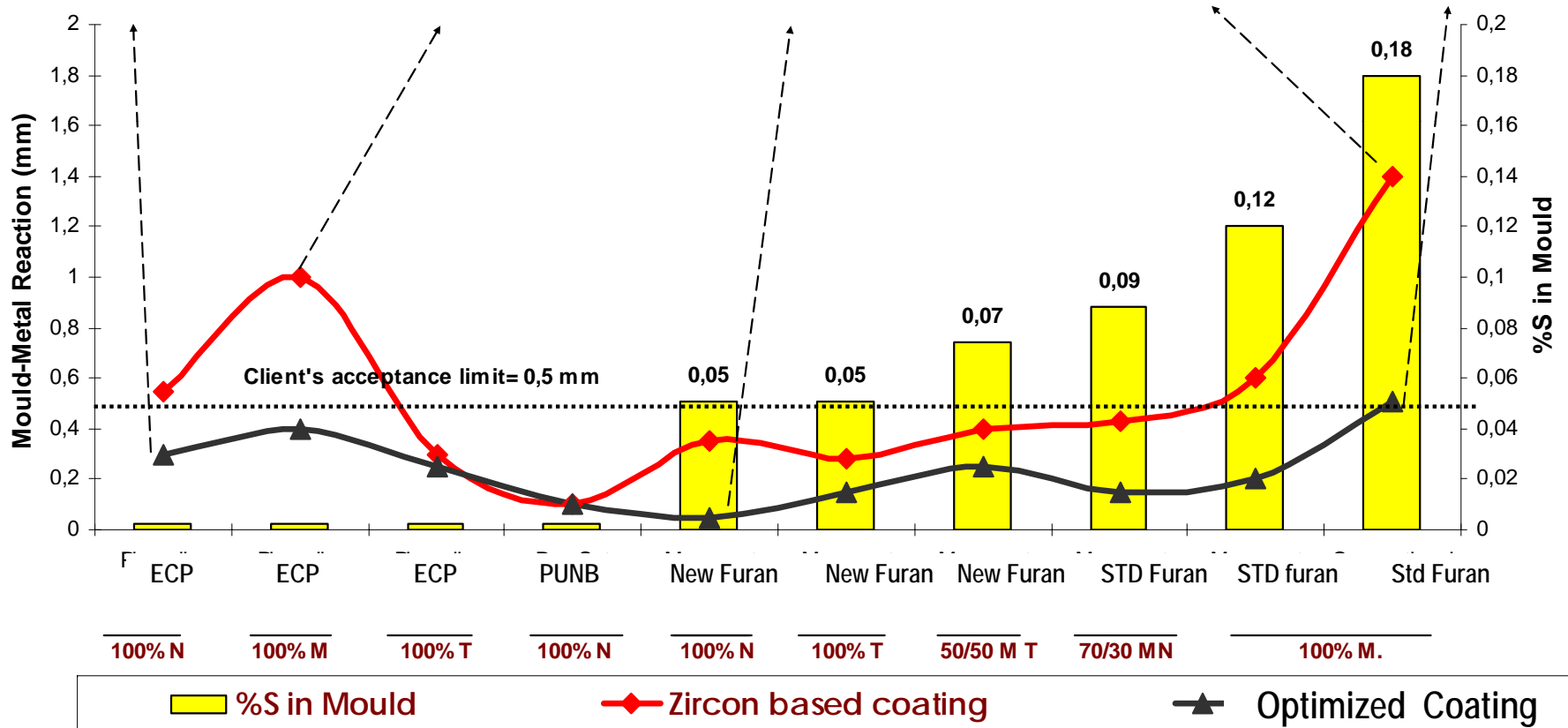
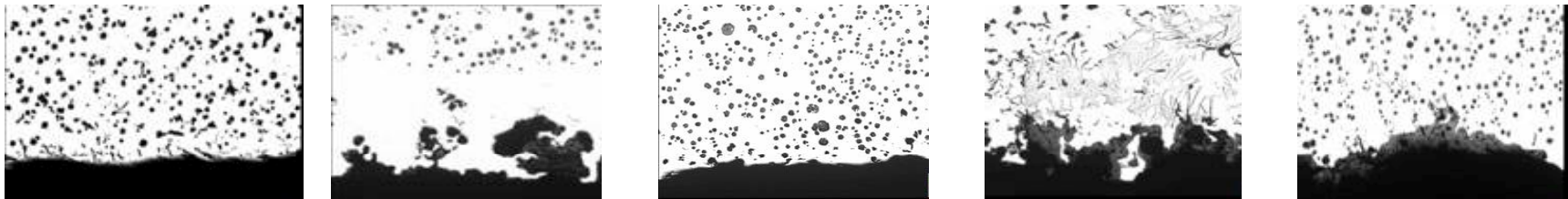


Low FF and zero Phenol systems combine with low sulphur Technology Systems



What Defects need to be eliminated

Mold Metal Reaction vs. Type of Coating, % Sulphur , Binder system and Type of Sand

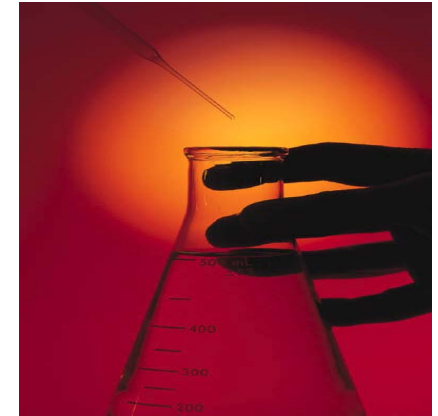


Attributes of New Furan Technology

- Improved EH&S
 - Improved Speed : 200 castings/day , 6 hrs/day, 4 days/wk and each castings is worth \$25. For every 10 casting per day increase \$50,0000 per year is realized.
 - Optimization of the variables is the key
 - Identify the problem
 - Match the binder problem
 - Track cost and improvements
 - Combine with other products
- WHAT IS IT THAT YOU NEED TO IMPROVE???

Attributes of New PUNB Technology

- New PUNB technology
 - Lower Viscosity
 - Lower smoke and odor
 - Lower binder levels possible
- What does that mean to a foundry
 - Improved flowability / core or mold density
 - Lower Hazardous air pollutants = better EH&S attainment
 - Lower odor for employees and community
 - Less binder means lower gas, improved veining resistance



New Phenolic Urethane No Bake Technology



Environmental Acceptability

Casting Quality

Productivity

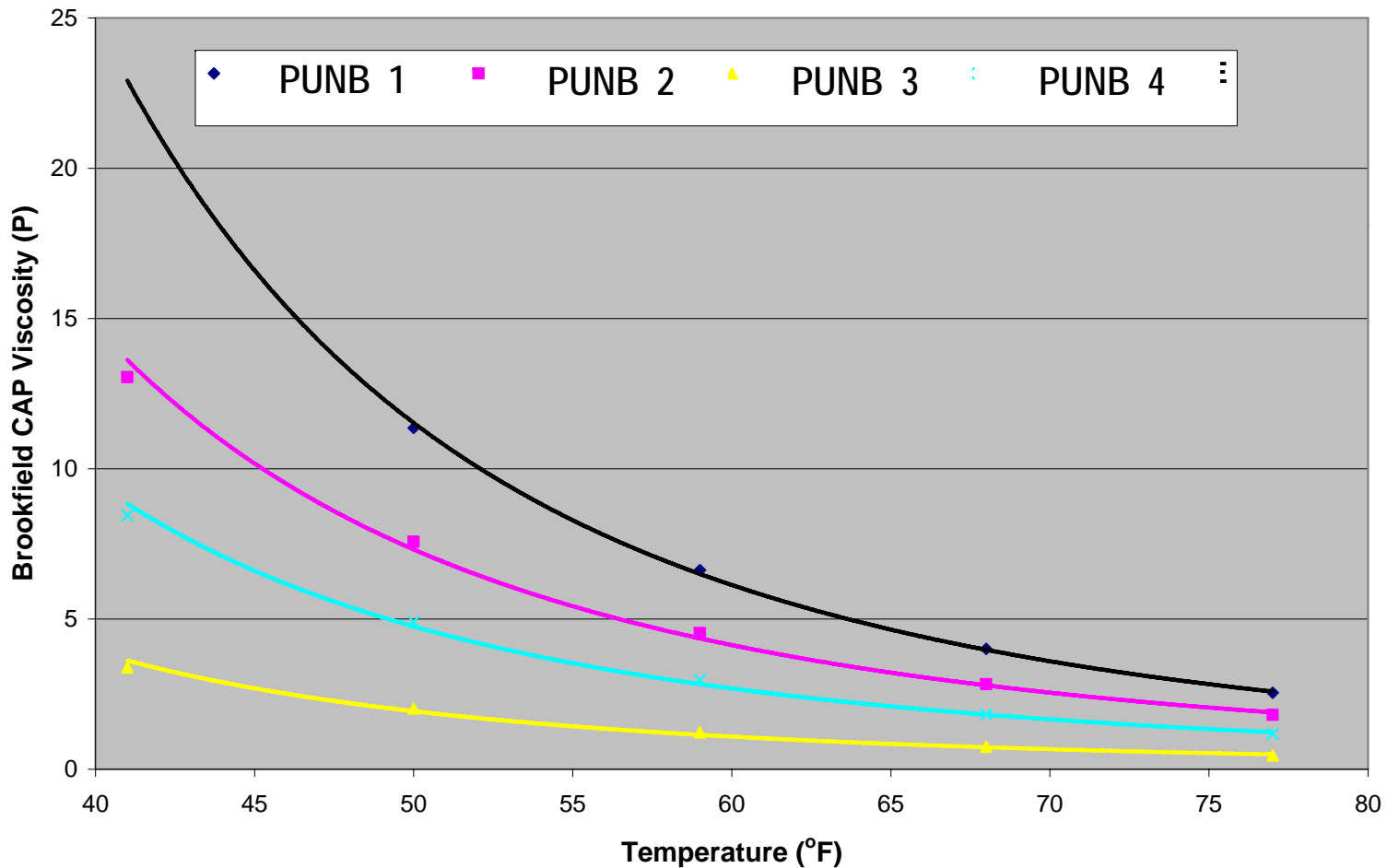
- Reduction in gas defects.
- Improved casting surface finish & reduced metal penetration!

- Low free Phenol
- Low odor at mold making & Reduction in core
 - ➔ Less Smoke & odor at pouring
 - ➔ Improved sand reclaim ability

- Improved dimensional accuracy
- Improved sand flow-ability and mold density.
- Improved release from patterns.

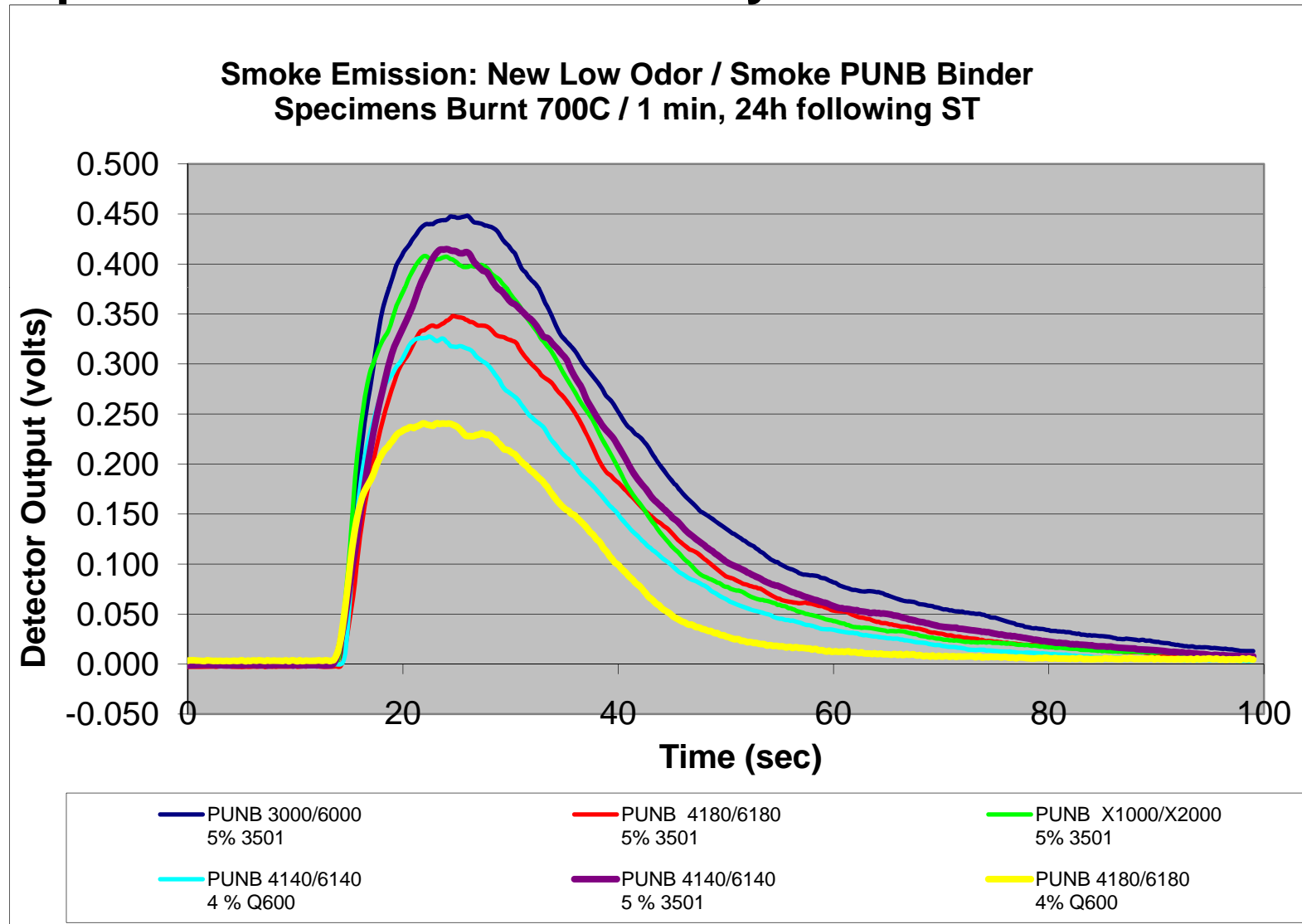
Viscosity Results

- **New Technology has lower viscosity than traditional PUNB**
 - Improved flowability of the mixed sand
 - Allows for less binder which lowers carbon footprint at same quality



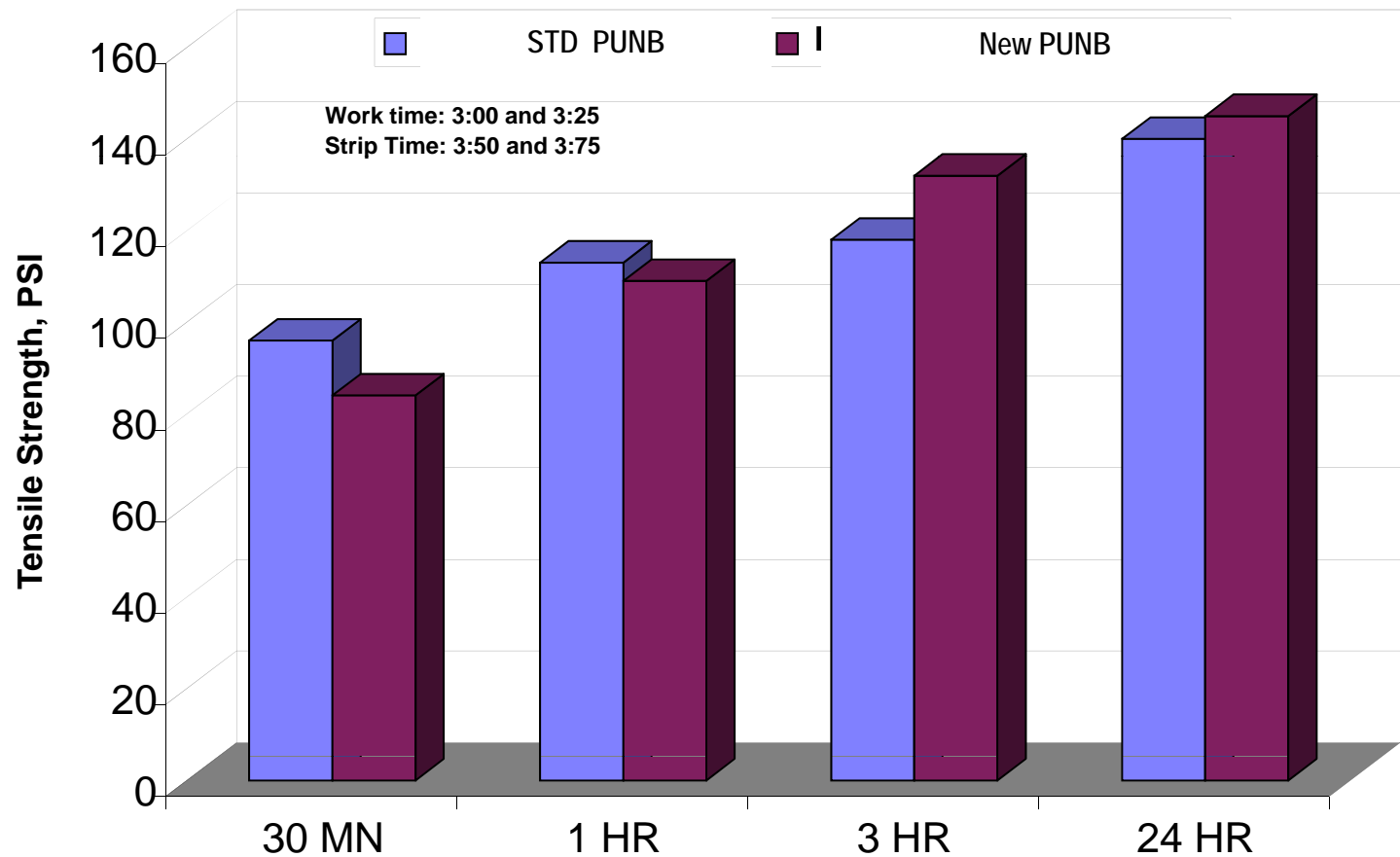
Lowering Smoke and Odor with New Technology

- Employee Exposure
- Improvements with community relations



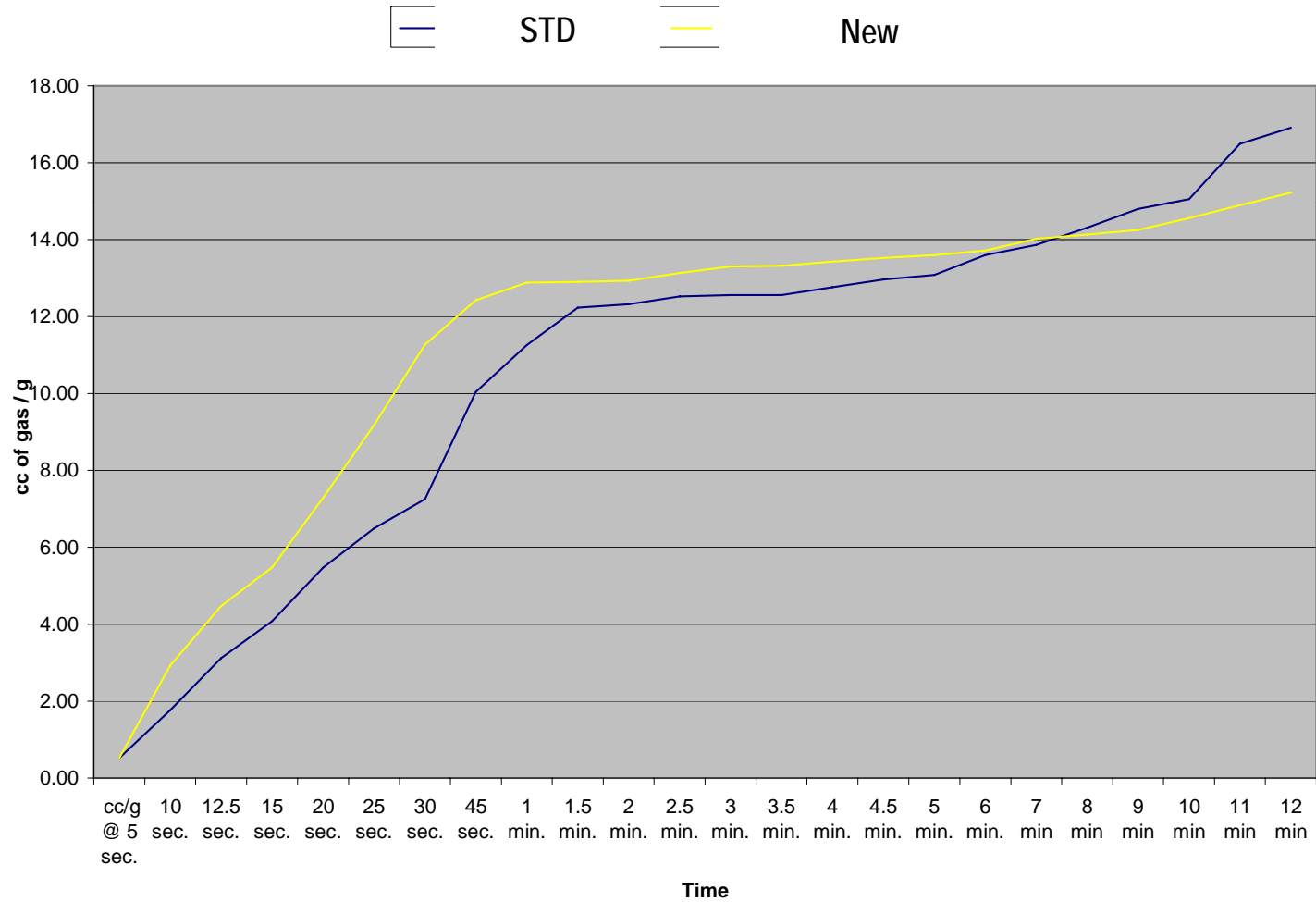
Tensile Strength Results

- **Comparing vs. a standard PUNB**
 - 1% binder level at 55/45 ratio
 - Sand temperature 20 °C and 59% Relative Humidity
 - CATALYST: 6.5 %



Gas Evolution

- Sand test conditions on New Sand
 - 1.2 % binder level at 55/45 ratio



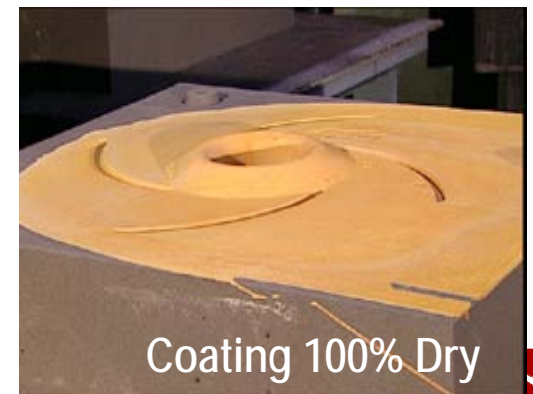
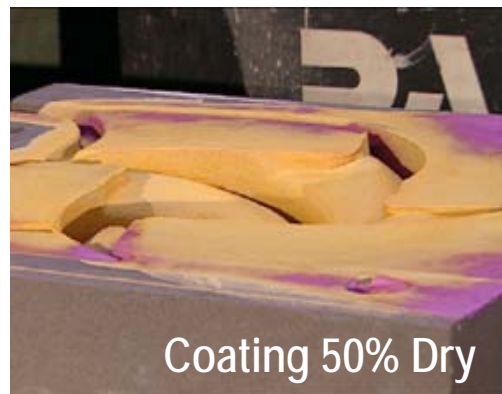
New Coating Technology

New Technology:

Color-Change Coatings!

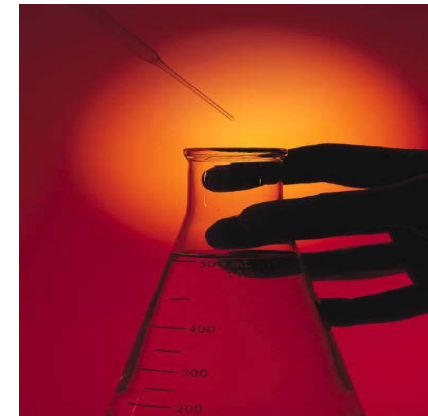
- For water-based coatings
- Visual determination of coating drying
- Can help conversions to H₂O-based from solvent-based

- New coating technology
 - Improvements in Casting Quality
 - Faster cycle times
 - Improvement on environmental issues



Conclusions

- New Technology vs. Optimized Technology for your process
- What problem are trying to solve and what does it cost you
- Cost to purchase vs cost to use
 - Need to understand which is better for each application
- Engage your suppliers



QUESTIONS??????

THANK YOU