


John Zink Capabilities Framework

JOHN ZINK CLEAN COMBUSTION. CLEAR SOLUTIONS.™



Fort "NOx"
KPM Symposium, Tulsa OK

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- ▶ About Fort NOx
 - About John Zink
 - What does it take to design a burner?
 - General KM philosophy
 - Fort NOx Overview
 - Conclusions

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- ▶ About John Zink
 - Flare Group -----

 - Todd Combustion -----
 - Process Burners

 - GORDON-PIATT® Group -----



RESPONSIBLE SOLUTIONS FOR YOUR ENVIRONMENT

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► What does it take to design a burner?



Ethylene Heater

□ Process Burners

Located at a ... Site
as part of a ... Quotation
for a ... Customer
burning a particular ... Fuel

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► What does it take to design a burner?

- Input Variables
 - Quote: Customer Info, ERP interface ...
 - Site: Air Temp, Elevation, RH ...
 - Furnace: BWT, O2, Spacing ...
 - Burner: Type, Qty, Configuration, Materials, APH, Draft, Heat Rel ...
 - Fuels: Composition, Pressure, Temperature ...
 - Test: Points, Conditions, Measurements ...
- Intermediate Calculations
 - Fuel Properties, Flue Gas Properties, Burner Sizing and Configuration, Constraints ...
- Output Variables
 - Emissions: NOx, CO ...
 - Flame Length, Width, Heat Flux ...
 - Cost Estimates
- Documents
 - BDS, BEDI, TRA, Form 100, Test Procedure, Cost Estimates, Test Sch Req, Test KO, Pro-E file, Cap Curves ...
 - ...

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► What does it take to design a burner?

394 Attributes captured on 43 Forms

Attribute	Type	Form						
		BDS	Burner	Burner	Burner	Quote	Furnace	Quota
1 Test	Test							
2 Burner	Burner							
3 Burner	Burner							
4 Test	Test							
5 Test	Test							
6 Site	Site							
7 Quote	Quote							
8 Furnace	Furnace							
9 Burner	Burner							
10 Burner	Burner							
11 Quote	Quote							
12 Furnace	Furnace							
13 Burner	Burner							
14 Burner	Burner							
15 Burner	Burner							
16 Burner	Burner							
17 Test	Test							
18 Test	Test							
19 Test	Test							
20 Test	Test							
21 Burner	Burner							
22 Burner	Burner							
23 Test	Test							
24 Test	Test							
25 Test	Test							
26 Test	Test							
27 Furnace	Furnace							

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► **How Did We Capture Knowledge?**

- How did we get experts to cooperate?
 - 85% is pedestrian engineering
 - 15%: developed targeted questions in the following way
- Reduction of Practice to Process
 - Back-to-front approach: started from output documents and worked backwards
 - Developed process map
 - 40+ documents → 400 objects/attributes
 - defined object/attribute states (list, numeric, Boolean, date)
 - Mapped objects/attributes to GUI
 - Added known algorithms/procedures/math models
- Construction of New Algorithms/Procedures/Models

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► **Don't automate a bad process!**

Knowledge Capture

PRIOR STATE

Universe of Knowledge

Declared Knowledge

Pseudo-knowledge

Tacit Knowledge

Gaps in Knowledge

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► **Impetus for the Project:**

Knowledge Capture

ON-GOING STATE

Universe of Knowledge

Declared Knowledge (expanding)

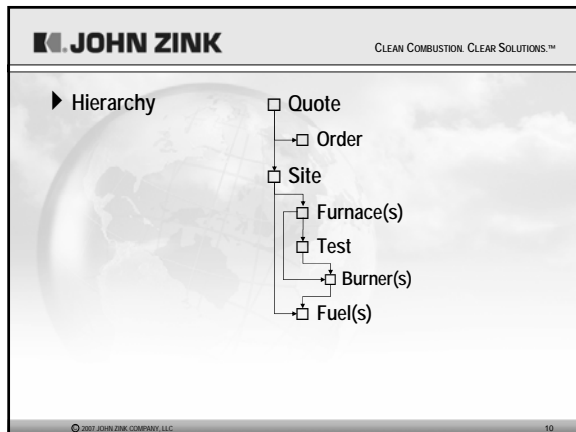
Pseudo-knowledge (shrinking)

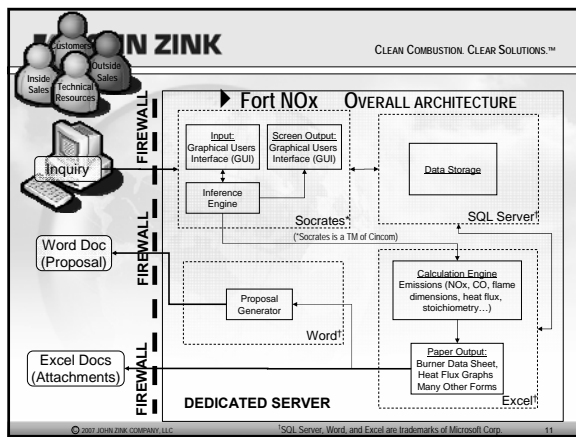
Tacit Knowledge (shrinking)

Gaps in Knowledge (shrinking)

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Fort Nox - Version 2.0.3

Quote | Furnace | Burner

Customer | Site/End User | Quote | Proj Schedule | Proj Payments | Order

Quote No. [get quote]

Revision No. [0]

Customer Name: 3122 Burner Company
Customer Number: 854173
Customer Contact: Joe Blow

Customer Info

Customer Company: 3122 Burner Company
Customer Contact: Joe Blow
Customer Reference: []
Customer Phone #: 123-456-7890
Project Name: []
Customer Type: []
Cost Rate: []
Cost Rate Territory: []
Proj Ref #: []
Customer Region: []

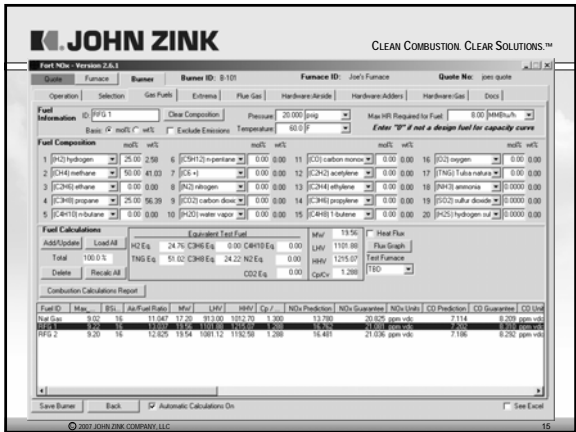
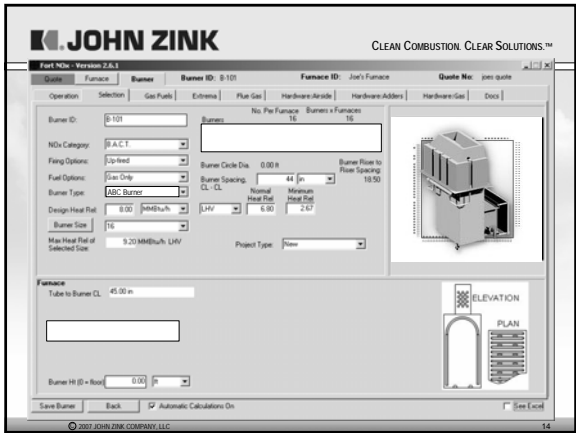
Total Price: []
Approx Total Cost: []
Approx Total Gross Margin: []
Generate PDF for this Quote

Furnace	Burner	St.	Qty	Price

Save Quote | Back | Quote Generation | Print Screen

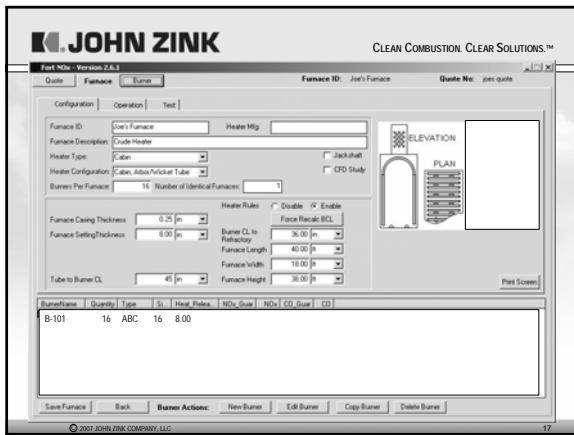
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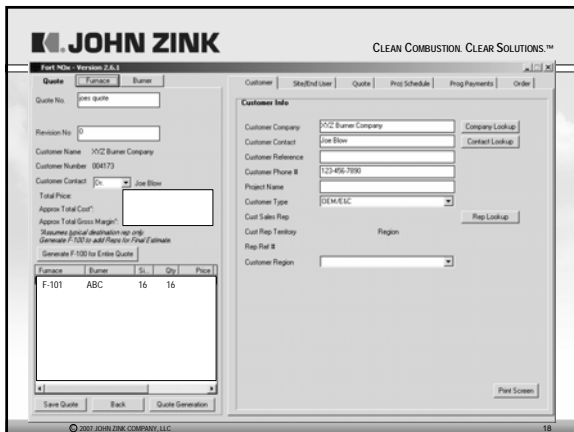
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