



Super Systems inc.

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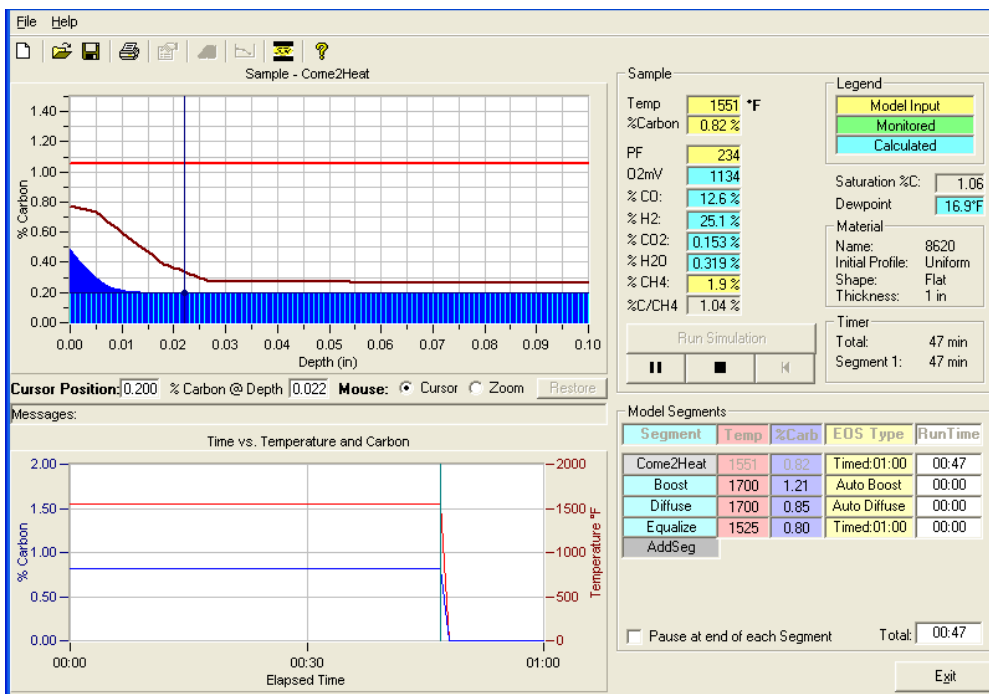
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CARB CALC II

SIMULATION SOFTWARE FOR CARBON DIFFUSION IN CARBURIZING FURNACE APPLICATIONS



- Prediction of carbon transfer between the atmosphere and the work pieces
- Diffusion of carbon into the product (work pieces)
- Computer-aided design of heat treatment process
- Optimization of existing cycles
- "What If" analysis for anticipated changes to existing process
- Process re-creation to determine effects of out-of-control load cycle
- Education of personnel in the intricacies of atmosphere heat treating
- Real-time monitoring with an on-line process

MULTIPLE OPERATING MODES

- Simulation: Used when constructing a diffusion gradient from a complex set of processing parameters.
- Real-time monitoring: Allows CarbCALC II to construct a carbon profile in real-time using data automatically taken minute by minute from SSI's SuperDATA SCADA software.
- Replay: It's similar to "Real-time monitoring" except that data is retrieved from SuperDATA's historically logged data and replayed at a much faster speed. In the replay mode, you can pause and re-start the data.

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*** User defined parameters

Name	%C	%Mn	%Ni	%Cr	%Mo	%Si	%V	%Cu	%Al	%P
8621	0.20	0.80	0.55	0.50	0.20	0.30	0.05	0.05	0.05	1.00
8622	0.22	0.80	0.55	0.50	0.20	0.30	0.05	0.05	0.05	0.00
8625	0.25	0.80	0.55	0.50	0.20	0.30	0.05	0.05	0.05	0.00
8627	0.27	0.80	0.55	0.50	0.20	0.30	0.05	0.05	0.05	0.00
8630	0.30	0.80	0.55	0.50	0.20	0.30	0.05	0.05	0.05	0.00

User defined work piece characteristics

Alloy Database -

- Common materials used in metal treating
- Create "new" material
- Custom profiles

User Specified Segments -

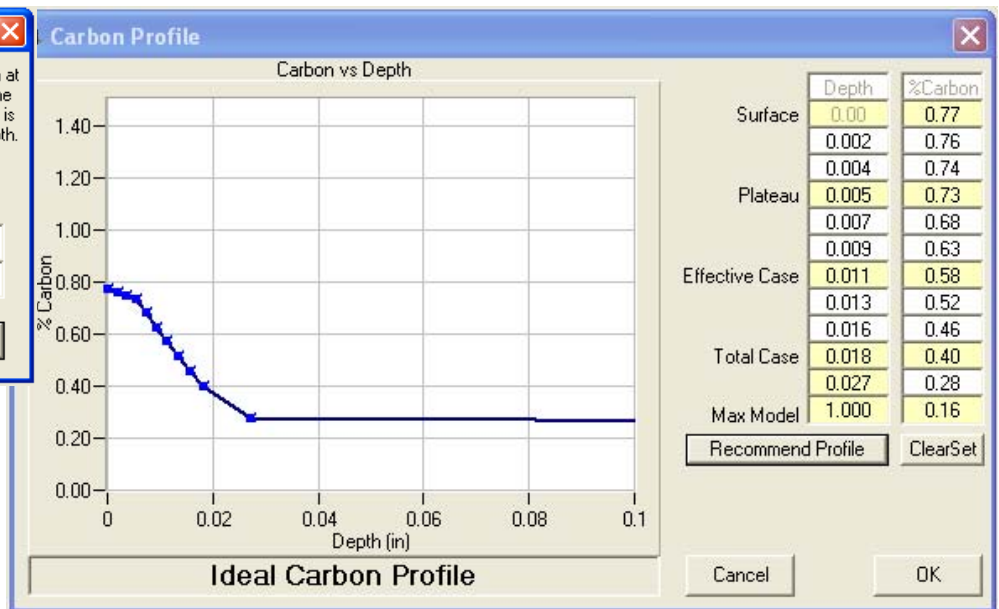
- Automatic Boost
- Automatic Diffuse
- Time constraint based segments
- Profile based segments
 - ◆ User specified carbon and temperature settings
 - ◆ User defined settings (% C, Depth)
 - ◆ Calculated results (Boost, Diffuse)

Segment	Temp	%Carb	EOS Type	RunTime
Come2Heat	1551	0.82	Timed:01:00	00:00
Boost	1700	1.21	Auto Boost	00:00
Diffuse	1700	0.85	Auto Diffuse	00:00
Equalize	1525	0.80	Timed:01:00	00:00

*** On the screen (Recommend Profile) below you enter your requirements for the carbon profile

Recommended Profile is based on Surface Carbon, Carbon at Effective Case Depth and Carbon at Total Case Depth. The Plateau point is added to ensure an "S" shaped profile and is set to 90% of Surface Carbon at 30% of the Total Case depth.

	%Carbon	Depth
Enter Surface Carbon	0.77	
Effective Case	0.58	0.011
Total Case	0.40	0.018



- User entered target profile
- System generated carbon profile
 - ◆ Based on user entered profile
 - ◆ Data points are calculated for best results