

Proposed Agenda

E. W. Bowman, Incorporated

Lehr Training and Annealing Seminar

INTRODUCTION TO ANNEALING LEHRS

Hands-on inspection of:

- Heated Zones-operation and design
- Cooling Zones-operation and design with and without super fans
- Skid Frames-internal belt return
- Recirculating Fan-heated zone and cooling zone
- Recirculating Fan-with fan speed sensor
- Control Panel-layout and function
- Drive Table-operation and design
- Roll-trunnion style manufacturing
- Charge Table-design and operation, belt tracking
- Burners-operation and trouble-shooting
 - Burners-Eclipse 50MME
 - Burners-Hauck-EWB57
 - Burners-Midco-DS45
 - Burners - Eclipse Ratio - Air

OPERATION AND MAINTENANCE ISSUES ON ANNEALING LEHRS- E. W. BOWMAN, INC.

OPEN FORUM QUESTION AND ANSWER PERIOD-facilitated by **Robert Holmes**-E. W. Bowman, Inc. Field Service Supervisor

Seminar Attendees and Bowman personnel will participate in a question and answer period. All attendees are encouraged to generate and submit questions beforehand, or bring to the seminar, lehr related questions.*

* Historically, this question and answer period has been extremely beneficial and free-flowing. If necessary, this will extend past 5:00 P.M. or continue on to the next morning session.

ANNEALING PROCESS TECHNICAL SEMINAR-E. W. BOWMAN, INC.
facilitated by **John Hann**- E. W. Bowman, Inc. Sales/Service, Glass Process

Specialist

- I. **Annealing-Key Definitions**
 - A. Stress/Strain and Force
 - B. Thermal Conductivity
 - C. Expansion and Contraction
 - D. Thermally Introduced Stress
 - E. Annealing

- II. **Annealing Process and Equipment**
 - A. Creation of Thermally Introduced Stress in Glass Containers
 - B. Removal (annealing) of Thermally Introduced Stress in Glass Containers

1. Annealing Lehr
 - a. Major Components
 - b. Annealing Point
 - c. Strain Point
 - d. Exit Temperature
- C. Measurement of Annealing
 1. Polariscope
 - a. Operation
 - b. Interpretation of Colors and Shading
 2. Real versus Apparent
 3. Scratch Testing

III.

Annealing Lehr Principles of Operation

- A. Cooling Zone Pressurization and Control of Airflow
- B. Ware Entrance Temperature
- C. Loading Patterns
- D. Tunnel Time
- E. Control of Annealing Curve
- F. Good Ware Quality
 1. Surface Defects
 2. Weight and Thickness Control

III.

Annealing Lehr Principles of Operation (Continued)

- G. Maintenance
- H. Record Keeping
 1. Zone Temperatures
 2. Belt Speed
 3. Loading Pattern
 4. Fast Cooling

QUESTION AND ANSWER PERIOD

Adjournment