#### **General Shale Brick**



# Operating a Lab in a Down Economy

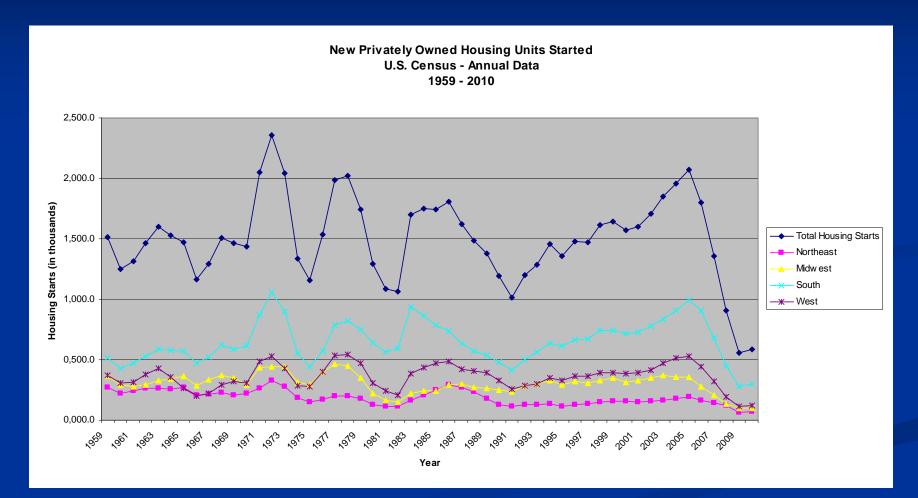
Jonathan Livingston

Manager of Research & Development





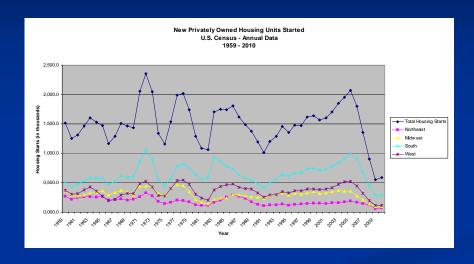
#### What Defines a Down Economy?







#### Housing Starts

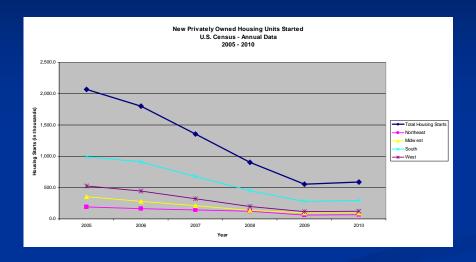


- Since records began in 1959, the number of new housing starts has never been below 1 million until 2008 (905,500)
- Prior to 2008, it has only dropped below 1.2 million 7 out of 49 years, the last time being 1990 1992
- Yearly housing starts doubled from 1991 to 2005





#### The Last 6 Years

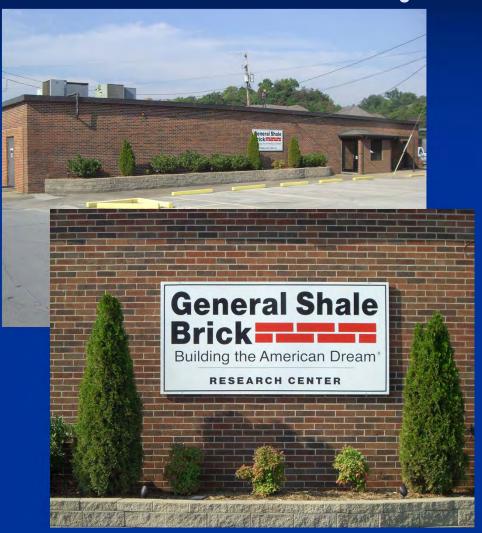


- 2009 554,000 Lowest level since records began in 1959
- 2009 was 27% of peak in 2005
- 2010 showed some recovery, but was still far below historical average (1.5 million/year)





#### History of the Lab



- Started in 1954
- Kingsport, TN
  - Plant Site
    - One of the original General Shale locations
  - Has weathered many downturns in housing starts
- Brick productionoperations ceased in 2008





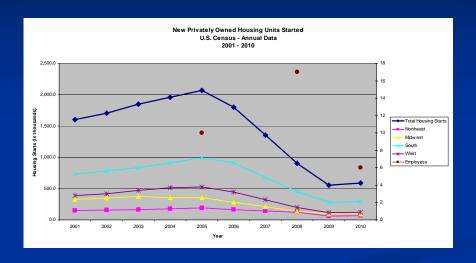
#### Relocated to Johnson City, TN







#### Lab Employees



- 2005 10 employees
  - 4 Ceramic Engineers
  - 1 Assistant
  - 5 Technicians

- 2008 17 employees
  - Addition of Robinson Brick
- 2011 6 employees





#### Current Lab Employees

- 6 Employees
  - 3 Ceramic Engineers
    - Jonathan Livingston
    - Rod Schutt
    - Ti Jones
  - 2 Technicians
    - Mike Sloan
    - Kenney McClaran
  - Steve German (Denver)













#### **Areas of Service**

- Product Development
- Process Research & Engineering
- Quality Assurance
  - Brick Materials
  - Brick Testing
  - Block Testing
  - Solid Fuel Testing

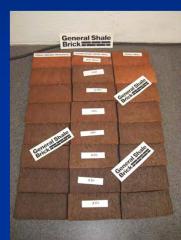
- Analytical Testing
- Training & Education
- Complaint Resolution
- Technical Support
  - Sales
  - Production





#### Product Development

- Color Development
  - Surface Colorant
    - Engobe
    - Sand
    - Mud Slurry
  - Body Colorant
    - Manganese
- Texture Development
  - Epoxy Texture Rollers
  - Tudor Texture













#### Product Development



Spring City #42 – Nottingham Tudor



Johnson City #10 – Nottingham Tudor

- Since 2006 we have relocated
  - 19 of our top 20
  - 36 of our top 40

best selling products to new locations

- More efficient plants
  - Lower fuel usage
  - Lower labor cost
    - Increased automation





#### Process Research & Engineering

- Plant Support
  - Traveling Thermocouples
- Project Support
  - On-Site Technical Assistance
- New Plant Engineering
  - Combustion System Design
    - Gas System
    - Coal System
- Result
  - More efficient plants
  - Lower production cost







- Brick Materials
  - Drill Samples
    - Absorptions
    - Shrinkage
      - Dry
      - Fired
    - Efflorescence
  - Additive Testing
  - Particle Size Testing
  - Brick Body Development
  - 2011 → Geology Department
    - Geologist runs extruder and most tests giving him "hands on" experience with the materials
  - Stockpile Testing
    - 2011 → Tested at Plants











- Brick Testing
  - Absorptions
  - Dimensions & Voids
  - Compressive Strength
  - Efflorescence
  - Weights
  - Freeze-Thaw Durability
  - 2005 Weekly
  - 2011 Monthly / Quarterly
  - Urgent Testing Need → NBRC









- Block Testing
  - Dimensions
  - Compressive Strength
  - Weights
  - Absorption
  - Concrete Density
  - Linear Shrinkage
- 2005 Monthly
- 2011 Quarterly













#### Solid Fuels

- 2005 Every other week
- 2011 Quarterly
  - Samples taken monthly at every plant location
  - Composite sample tested
  - If personnel available test
  - If not, send to an independent lab for testing





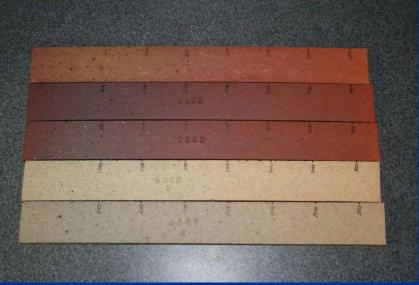






Orton Gradient Furnace









Orton Dilatometer







Horiba EMIA-220V Carbon/Sulfur Analyzer







#### Training & Education

- Technical Training
  - Distributor Sales Seminar
  - Internal Sales Seminar
- Production Training
  - Brick Manufacturing Course
- Course Material
  - ASTM Specifications
  - Lab Testing / Services
  - Drying & Firing Discussions
  - Brick Cleaning
  - Complaint Resolution









#### Complaint Resolution

- Mike Sloan &Kenney McClaran
  - Color CorrectionTechnicians
- Costs for correction are charged out toSales locations
- When not working on complaints, they can help out with Lab tasks.







#### Complaint Resolution

- Leaky Walls
  - Hurricane Test
  - Wall Section Test
  - Rilem Tubes









#### Murals

- MasonArt®
  - Johnny Hagerman









# <u>Summary</u>

#### Operating a Lab in a Down Economy

- Since 2005, the Lab has had a reduction in budget and workforce as well as a relocation to Johnson City, TN.
- Many services are still available, but it is no longer possible to react as quickly to all requests.
- Must concentrate on our core services and prioritize based on what items can create profit or provide a cost savings for the company.
- A good relationship with other departments within the company and outside labs & suppliers critical to getting tasks completed in adequate time.





#### **General Shale Brick**



# Questions?

Jonathan Livingston

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General Shale Brick, Inc.

Johnson City, TN



