

General Shale Brick 

Building The American Dream[®]

Operating a Lab in a Down Economy

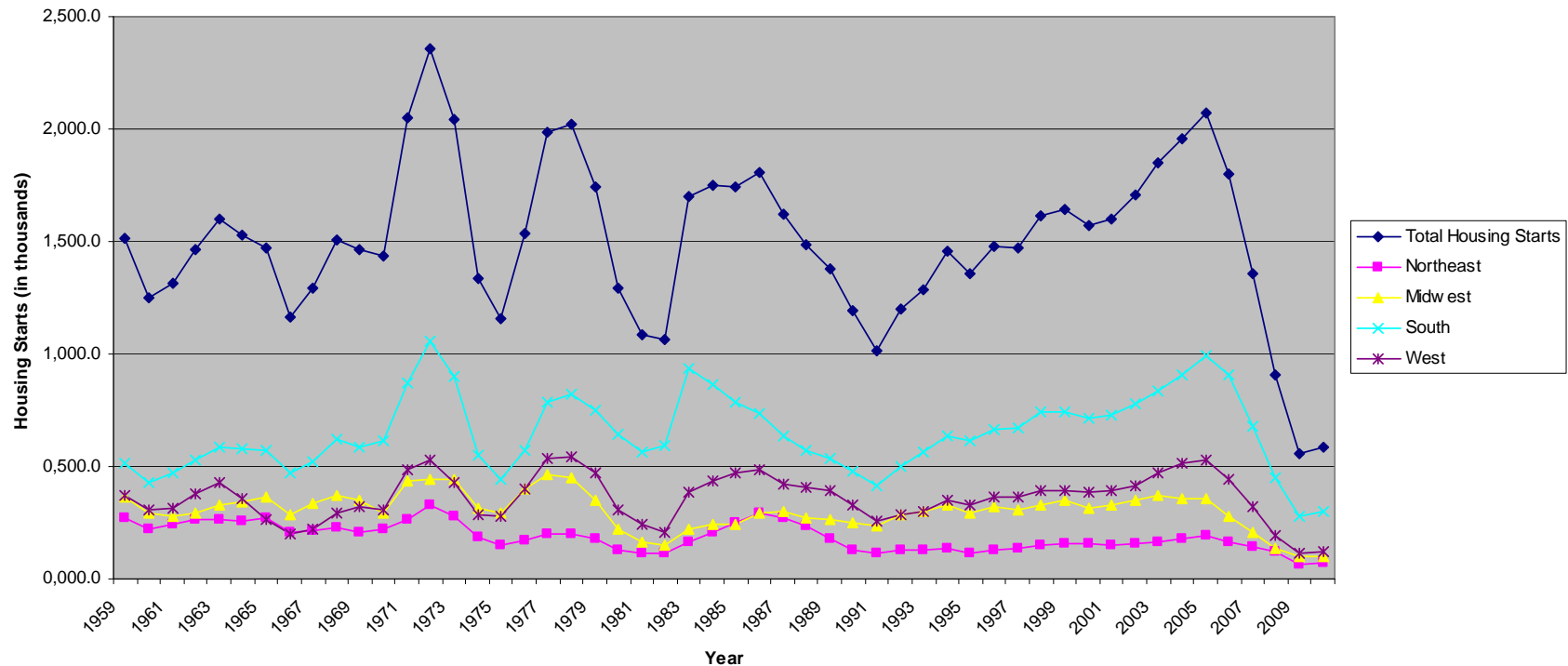
Jonathan Livingston

Manager of Research & Development

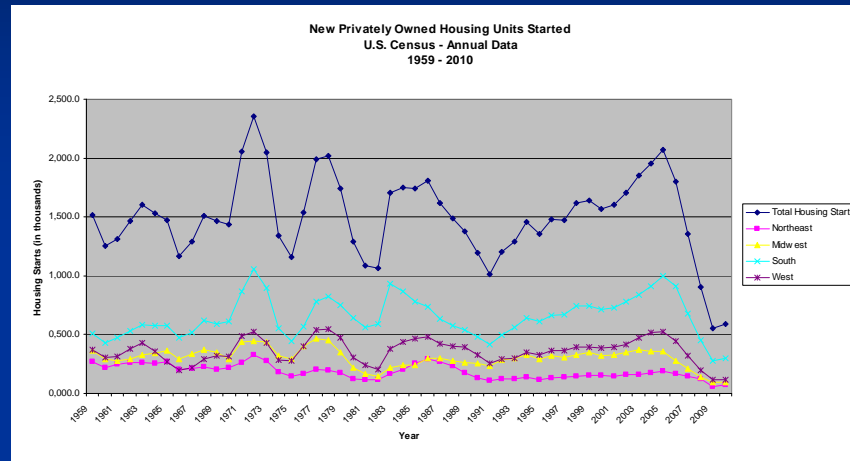


What Defines a Down Economy?

New Privately Owned Housing Units Started
U.S. Census - Annual Data
1959 - 2010

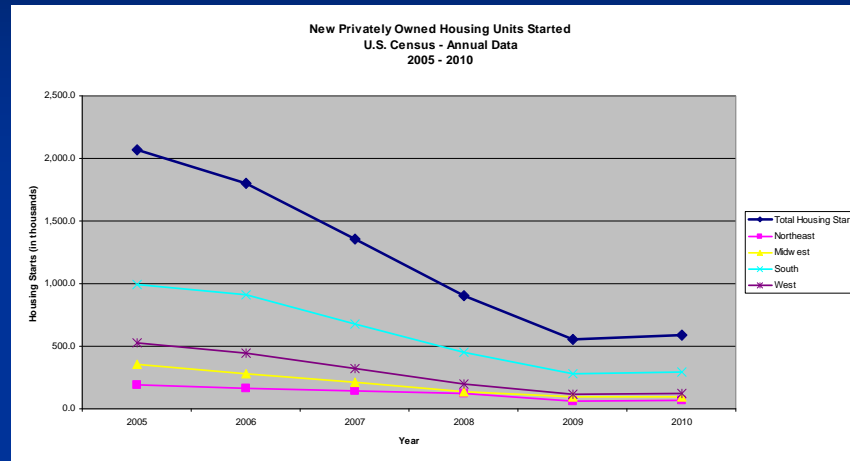


Housing Starts



- 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



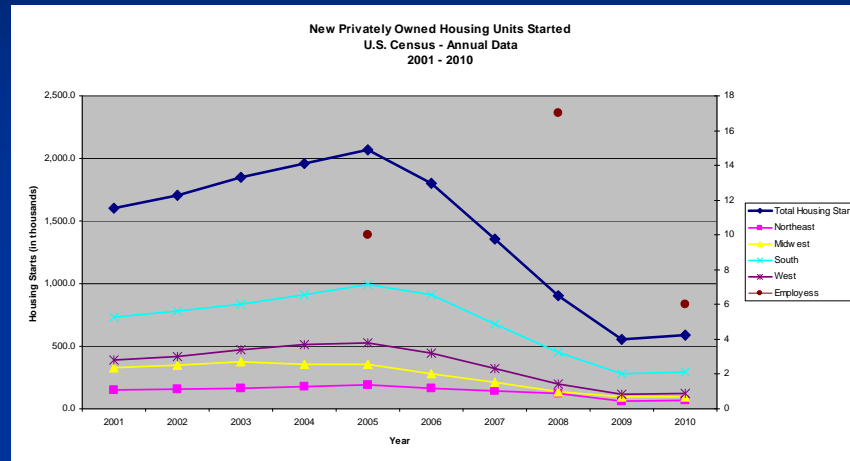
- Started in 1954
- Kingsport, TN
 - Plant Site
 - One of the original General Shale locations
 - Has weathered many downturns in housing starts
- Brick production operations ceased in 2008

Relocated to Johnson City, TN



- Corporate Office
 - Completed January 2008
 - Lab moved in on September 2008

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



Quality Assurance

■ 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



Quality Assurance

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



Quality Assurance



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

Quality Assurance



■ 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

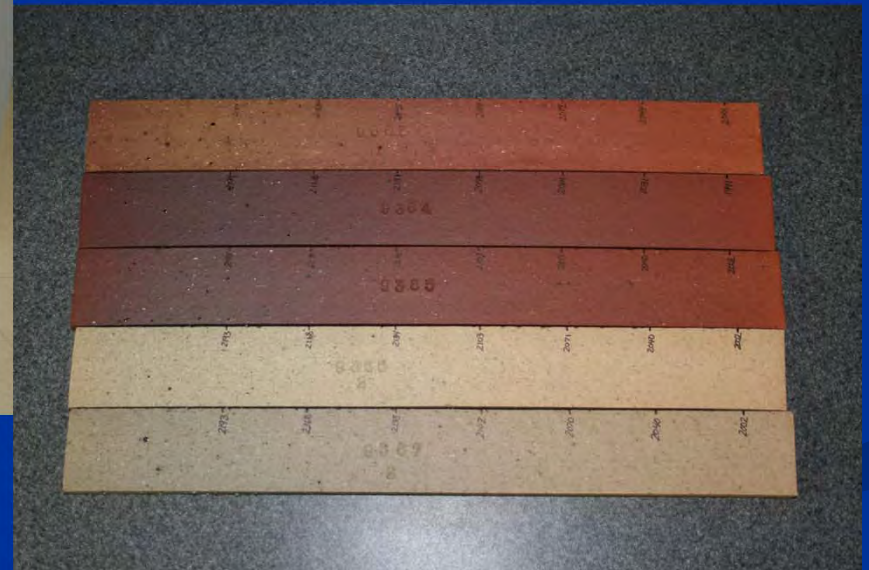


Analytical Testing



Analytical Testing

- Orton Gradient Furnace



Analytical Testing

- Orton Dilatometer



Analytical Testing

- 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 Correction Technicians
- Costs for correction are charged out to Sales 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



Summary

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 

Building The American Dream[®]

Questions?

Jonathan Livingston

Manager of Research & Development

General Shale Brick, Inc.

Johnson City, TN

