



# 2009 EAF Melt Shop Market Study

Profile Reports

Project #441

Survey # 

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## I. PLANT IDENTITY:

- A. Name of Company: **The Steel Company**
- B. Plant Location: **Steeltown, USA**
- C. EAF Melt Shop Designation: **Melt shop**
- D. General Phone #:
- E. Comments: **Merchant bar shapes such as rounds, hex, flats, angles, and squares are produced at this melt shop. A twin shell DC electric arc furnace with 100 heat size and a ladle furnace are in operation. They have a very good operation and only recently there was a reduction in production required. The respondents agree that if an economic recovery takes**

## II. CONTACTS

1. Name: **John Doe** Date: **10/16/2009**  
Title: **Plant Manager**  
Address: **123 State Street**  
City: **Steeltown** State: **PA** Zip: **12345**  
Phone: **(123) 456-7890** Ext: Fax:  
eMail:

### III. GENERAL EAF MELT SHOP INFORMATION

#### A. General Melt Shop Information

1. No. of EAF melting units: **2**
2. EAF & LF Data:

	Type (AC/DC)	Heat Size (short tons)	Heats (per day)	Manufacturer	Year of Start-up
EAF # 1	DC	100	40	SMS Demag	1997
EAF #					
EAF #					
LMF	XXXXX	100	40	SMS Demag	1997

a. Comment:

3. Total Steel Production: 2008 1000 kton 2009 (projected) 800 kton

a. Percent of production by major end-use markets:

Auto: \_\_\_\_\_ Appliance: \_\_\_\_\_ Pipe: \_\_\_\_\_

Other, specify **Merchant to bar products - 100%**

- b. Are you planning to increase your production of HSLA steels? No

(1) What increase is anticipated? \_\_\_\_\_ %

(2) What end use markets are impacting most significantly on the greater demand for HSLA steels?

4. What problem, issue or concern is presently having the most significant negative impact on the present steelmaking performance? (Distribute 10 points among the 3 or 4 selected priorities.) Priority:

\_\_\_\_\_ Increase productivity

3 Reduce operating costs at the same production level

4 Improve quality \_\_\_\_\_ Reduce scrap dependency

3 Reduce electricity consumption

\_\_\_\_\_ Other, specify: \_\_\_\_\_

#### B. EAF Operating Parameters and Performance:

1. Electrical power usage: 390 Kwh/T

2. Transformer capacity: 90 MVA

3. Average power: 48 MW

4. Charging method(s):  Continuous  Bucket  Combination

a. If by Bucket, how many buckets are used? 1

b. Does this limit use of virgin iron units? No

5. Yield: 92 %

6. Para III Comment:

**Their production requirements were good until late May, and it is holding at the present level. There are no good indicators to determine an increase or decrease.**

#### IV. IMPACT OF CURRENT GENERAL ECONOMIC CONDITIONS

A. We all recognize that the steel industry is currently facing one of the most difficult periods, how is this impacting on your business in the following areas:

1. As we emerge from this crisis, what changes in steel production do you expect to achieve compared to your 2007?  None  Increase  Decrease 10-15 %

a. Comment:

2. Are there any concerns regarding the sustainability of your plant/operation No

a. If YES, comment?

3. As a result, are you considering altering your present product mix? \_\_\_\_\_

a. If YES, how will you be changing your product mix?

4. Are you considering or planning any changes in your major process equipment to address this shift? \_\_\_\_\_

a. If YES, describe:

5. Do you expect tightening environmental regulations to have an impact on your plant? No

a. If YES, describe:

6. Do you expect the various stimulus packages to have an effect on your plant / operation / business? Yes

a. If YES, describe: **Their production requirements were good until late May, and it is holding at the present level. There are no good indicators to determine an increase or decrease.**

7. Do you expect the "Buy America" incentives to have an effect on your plant / operation / business? No

a. If YES, describe: **They do not see much emphasis on this subject.**

8. What changes are you anticipating in the industry as a whole as a result of the recent economic factors?

**The respondents agreed that no company will operate marginal plants and that they will pick up the slack with improved operation at the surviving plants.**

9. Para IV Comment:

**The steel industry will definitely be streamlined with less operating plants and maybe additional consolidations. The respondents said there will definitely be some impact from the global influence on the economy.**

## V. SCRAP CHARGING, SCRAP & OTHER ALLOY CHARGE MATERIALS CHARGED

A. Does your present product mix require the use of virgin metallics (pig iron, HBI, DRI)?     No    

1. If NO, could it be used in the future?     2    

a. Comment:

2. If so, what are the most critical virgin metallic elements, and what are overall charge limits for these?

Charge Materials:	% Limit
1.	
2.	
3.	
4.	

3. What are your typical charge levels (% of charge mix) of the following?

Charge Materials:	% Limit
1. Pig Iron	
2. HBI	
3. DRI	
4. Shredded Scrap	<b>50</b>
5. Bushelings	
6. #1 HMS	
7. #2 HMS	<b>30</b>
8. PS	<b>10</b>
9. Turnings	<b>5</b>
10. Borings	
11. Others, specify:	

B. What are you injecting in the EAF?

Injected Materials & Gases	Rate of Injection
Carbon (Kg or Lbs/ton)	<b>42</b>
Natural Gas (Cu Ft/Ton)	<b>1,100</b>
Oxygen (Cu Ft/Ton)	<b>800</b>
Fluxes (Kg or Lbs/Ton)	<b>NA</b>
Others, specify:	

C. Para V Comment:

**Residuals are not an issue when making their product mix. They do not need the expensive iron substitutes. The fluxes are added through the roof.**

**VI. THE USE OF FeSi ALLOYS**

A. How much 75% FeSi is used per ton of steel produced? \_\_\_\_\_ Lbs/Ton

1. Are you using any special FeSi other than 50, 75, or 90% FeSi? \_\_\_\_\_

a. If YES, what?

B. How much HC FeMn is used per ton of steel produced? 10-15 Lbs/Ton

1. Are there any special specifications on your HC FeMn? No If YES

a. Mn: 70-75 %                      b. Phosphorus: (1) PPM

c. Carbon: Min: (1) %    Max: \_\_\_\_\_ %

d. Others, specify:

C. How much standard SiMn is used per ton of steel produced? 10-15 Lbs/Ton

1. Are there any special specifications on your SiMn? \_\_\_\_\_ If YES...

a. Mn: 60-65 %                      b. Phosphorus: (1) PPM

c. Others, specify:

d. How many tons of low carbon SiMn (FeMnSi) do you consume in a typical month? 900 Tons

e. In which applications do you use low carbon SiMn (FeMnSi)?

Electric steels     Transmission pipe     Stainless grades

Other, specify:

D. Para VI Comment:

**1) You can purchase these alloys at various levels of Mn which will determine the phosphorus and carbon content. Based on price, they actively swing back and forth between these materials. There is no typical specification.**

**VII. REFRACTORY WEAR MEASUREMENT**

A. Do you currently use, or have you investigated products that measure refractory wear or thickness? \_\_\_\_\_

1. If YES, specify type:

- Infrared/Thermographic
- Laser
- Thermocouples
- Optical
- Other, specify: \_\_\_\_\_

B. Do you know of technology that monitors refractory wear continuously? Yes

C. In what EAF melt shop molten metal application is refractory erosion or failure causing the most significant problem?

- EAF      1. Specify:     Roof       Walls     Bottom
- AOD      2. Specify:     Lid       Walls     Bottom
- RH degasser    3. Specify where: \_\_\_\_\_
- Ladle      4. Specify:     Slag Line     Walls     Bottom
- Other, specify \_\_\_\_\_

1. If "ladle" is checked above:

- a. Do you have a ladle furnace? Yes
- b. What method of stirring is employed?     Porous Plug       Electromagnetic
- Other, specify: \_\_\_\_\_

D. Could a system that continuously monitors refractory wear help improve that problem / situation? Yes

1. If YES, how?

- By reducing or eliminating breakouts
- By improving gunning practice
- Improve RH degasser refractory performance (specify what part:) \_\_\_\_\_
- Improving ladle refractory life at:     Slag Line       Walls       Bottom
- Other, specify \_\_\_\_\_

2. Would you consider a trial to evaluate a technology that would monitor refractory wear? Yes

E. Specifically regarding the EAF bottom refractory, assuming that you could continuously monitor the refractory thickness, this would allow you to...

- Reduce chain profiling of the bottom
- More effectively gun the furnace bottom
- Increase the campaign life
- Increase production
- Other, specify: \_\_\_\_\_

F. Para VII Comment:

**The DC EAF has the right mix of shell diameter and arc length, and they do not have a concentrated wear pattern on the walls. They also monitor thermocouples in the bottom of the furnace. There is some wear at the lance ports due to the injections. They feel confident with the ladle refractory practice. They want to know more about this continuous monitoring technology since it may have merits in safety and lower costs.**

**VIII. PLANS TO UPGRADE, REPLACE, OR ADD ANY MAJOR PROCESS EQUIPMENT**

A. Are you considering or do you plan to upgrade, replace, or add any major process equipment to the EAF Melt Shop?     **No**    

1. Scope:

a. Is this planned (P) or Considered (C)?                     

b. Have you selected a supplier?                     

c. If YES, who?

d. If NO, who are you considering?

2. When is this project scheduled for procurement?                     

3. Is money approved?                     

B. Para VIII Comment:

**there are no spending plans at this time. They have a good operation and are waiting to ramp up their production.**

**IX. INDUSTRIAL GAS ISSUES**

A. Who is your industrial gas supplier?     **Air Liquide**    

1. When does the contract expire?     **Don't Know**     (mo/yr)

B. Oxygen usage

1. What form?    Liquid oxygen    On-site oxygen generation

2. If on-site, what size of on-site?     **55**     tons/day

3. What is your typical O2 usage?                      SCF/ton

C. Whose EAF injection equipment are you now using? (i.e., PIT, Co-Jet, Phoenix, etc.)

    **Moray**    

1. When was that installed?     **2000**    

2. Rate your satisfaction with that equipment (on a scale of 1-10):     **9**    

3. Are you planning or considering replacing or upgrading this equipment in the next 1-3 years?     **No**    

D. Are there any limitations in your EAF operation for increasing the use of chemical energy?     **No**    

1. Indicate the following reason(s):

- No need                       Bag house                       Water cooling
- Injection equipment         O2 Supply                       Not cost effective
- Other, specify:

E. Are you anticipating or expecting any increase in Electric Power Rates in the next 3 years?     **Don't Know**    

1. Price/kwh?                     

F. Are you presently using an off-gas analysis system?     **No**    

1. If NO, are you planning or considering purchasing such a system?     **No**

G. How many ladle pre-heaters are you using? 4

1. Would you consider oxy-fuel burners to save natural gas? Don't Know

H. Para IX Comment:

**With the present uncertainty in the economy, they do not know what will happen to the electric power rates. They have considered the use of oxy-fuel burners for ladle preheat, but the evaluation indicated it was not cost effective. Depending on how the present situation of one cost versus the other, they may revisit the subject.**

I. Who are the key decision makers that will be involved in the specification and selection of an outside supplier for this project?

- |             |           |
|-------------|-----------|
| 1. Name:    | 1. Title: |
| 2. Name:    | 2. Title: |
| 3. Comment: |           |