

INTRODUCTION

Objective

The objective of this market study was to characterize Electric Arc Furnaces (EAF) melt shops in North America and assess their current requirements and target the best opportunities for various EAF Melt Shop processing technologies, equipment, and services for these facilities.

This report is intended to provide useful information enabling suppliers of products and services to formulate a marketing and business strategy aimed at EAF Melt shops. This report and the specific EAF Melt Shop data and information provides an opportunity for suppliers to assess the market for certain new technologies, equipment upgrades or replacements, new melt shop facilities and certain outsourced mill services.

In addition, the report is intended to assess the impact the recent economic crisis on the production, product mix, and outlook for EAF Melt Shop operations in North America.

Background

AIM Market Research has conducted hundreds of market studies focused on the steel industry over the last 21 years. Of the more than 450 projects completed, many have concentrated on EAF melt shops. As a result, AIM has many contacts in melt shops in North America.

AIM Market Research has the qualified personnel, industry experience and contacts necessary to have performed and completed this unique assignment.

Scope

This study included interviews with key personnel in 61 EAF melt shops in the U.S. and Canada. To provide further insight into the analysis, in addition to summarizing the overall results, the results are also analyzed by segment. The three segments were categorized by the products produced by the EAF melt shops surveyed. These segments are further discussed under "Methodology".

Information provided in this report:

A questionnaire was the basis for the information that was obtained in the survey of 61 EAF Melt Shops in the United States and Canada. The following information was obtained from each of the plants surveyed:

1. A general characterization of the EAF melt shops surveyed, including: the number and types of EAFs, heat sizes and heats per day, and EAF manufacturers; ladle furnace information, including: manufacturers, heat sizes and heats per day.
2. EAF melt shop production, including: 2008 and 2009 steel production, the projected change in steel production, and that production by end-products.
3. Operating priorities for improvement, operating parameters and performance EAF transformer rated capacity; scrap charging methods, the number of bucket charges practice and whether this imposes limitations regarding the use of virgin iron units; and melting "yield" information.
4. The impact of current general economic conditions, including: projected changes and concerns regarding their sustainability; whether they will be altering their product mix, plans to increase production of HSLA steels, whether they are planning or considering changes to process equipment, the impact of tightening environmental regulations, the possible effects of the various stimulus packages and incentives, and any anticipated other changes in major process equipment.
5. The use of alternative charge materials, including: virgin iron units and their charge limits; alternative scrap based iron bearing charge materials; injected materials and gases, including: carbon, natural gas and oxygen; and the use of ferro-alloys.
6. Refractory wear measurement, including: specific technologies and their knowledge of these technology; where refractory erosion or failure causes the most significant problems; the benefits of using a continuous refractory wear measurement device; plants that would consider monitoring technology; and expectations for improving the performance of EAF bottom refractories and ladle refractories.
7. Information regarding the use of industrial gases, including: the current industrial gas suppliers and contract expiration dates; the form of oxygen supplied; consumption of oxygen per ton of steel produced and annual oxygen consumption.
8. Information regarding their injection equipment, including: EAF injection equipment suppliers; plans to replace or upgrade that equipment; limitations for increasing chemical energy; electric power rates and costs; the current use of off-gas analysis; and ladle pre-heater information and the use oxy-fuel burner for ladle preheating.
9. Information regarding the EAF transformers in use, including: information regarding manufacturers, power rating and line voltage, winding form design, year of installation, spares, and plans to upgrade, replace or add EAF transformers.

10. Capacitor information, including: whether they have a fixed capacitor bank, the manufacturer, capacitor bank ratings; capacitor can manufacturers and when they were installed; and the use of outside service providers and the suppliers current used.
11. Information regarding capital projects and expenditures that are planned or considered.

From the above data, this report ...

1. Assesses the market for various process technologies and services.
2. Targets prospects for various process technologies and services.
3. Provides operating data and information about EAF Melt Shop operations.

Methodology

Overall, 100 individuals were interviewed in the survey. Individuals from “melting Operations” accounted for 57% of all individuals interviewed and “Electrical” represented another 20%. Figure 1 provides a summary of the areas of responsibility of the individuals interviewed in the survey. The names of these individuals are provided in Appendix 2.

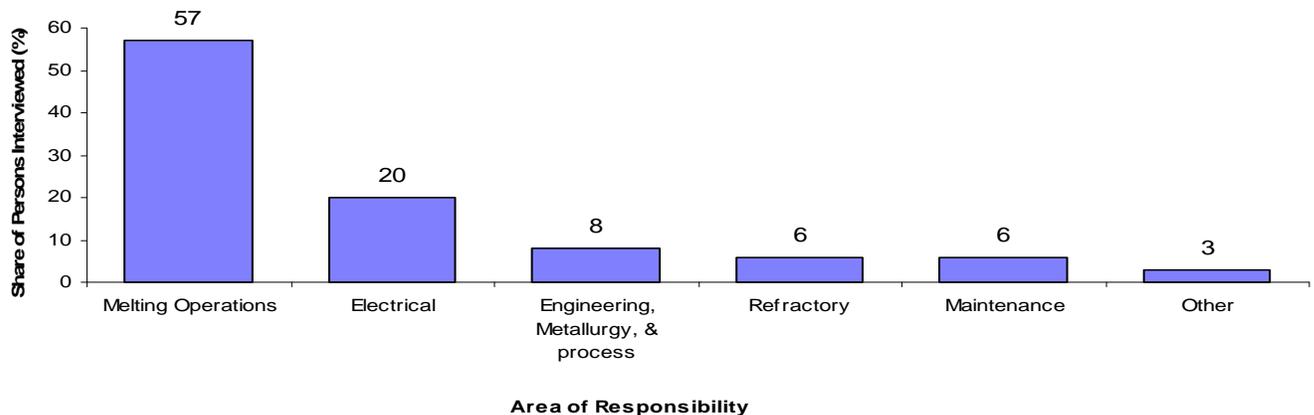


Figure 1 - Responsibilities of Persons Interviewed

The survey was conducted between July 26, 2009 and September 21, 2009.

A questionnaire was developed for use as the basis for collecting data from the individuals surveyed. The questionnaire is also the basis of the format for the “Profile Reports” provided for each of the plants surveyed. The completed Profile Reports are included in a separate binder.

Segment Analysis

In order to provide further insight for the purpose of analysis the plants surveyed were each assigned to one of four “types of plant” segments based on the products that account for the most significant portion of their production. First of all, they were separated between long products and flat roll products. The long products producing plants were further divided into “Rebar & Structural” long products and the “Higher Quality” long products, (such as, SBQ, merchant bar, seamless tube, and wire rod.) Table 1 summarizes the number of plants surveyed by segment and their total projected 2009 steel production.

Table A
Segment Analysis – Steel Production

Segment	Number of Plants	2009 Steel Production Tons/Yr
<i>Rebar & Structural Long Products</i>	27	12,073,000
<i>Higher Quality Long Products</i>	19	7,790,000
<i>Flat Products</i>	10	10,670,000
<i>Other Plants</i>	3	800,000
<i>Total</i>	59 ¹	31,333,000

¹ Two plants did not provide production projections for 2009.

The plants surveyed are located in the U.S. and Canada. The U.S. accounted for 48 plants and Canada for 3. In terms of the steel produced, the melt shops in the U.S. account for 91% of the EAF steelmaking indicated by the plants surveyed. Table B summarizes the number of plants surveyed by segment and country.

Table B
Segment Analysis by Country

Segment	U.S.	Canada	Total
Rebar & Structural Long Products	28	0	28
Higher Quality Long Products	17	2	19
Flat Products	10	1	11
Other Products	3	0	3
Steel production (000) tons	28,423,000	2,910,000	31,333,000
% Steel production	91%	9%	100%
Total	48	3	61

The 51 EAF melt shops surveyed in the U.S. are located in 34 different states or provinces. The leading states in terms of the number of plants are Ohio (6), Texas (5), Arkansas (4), Alabama (4), and Pennsylvania. All three of the Canadian plants are located in different provinces. Figure 2 indicates the share of plants surveyed by State.

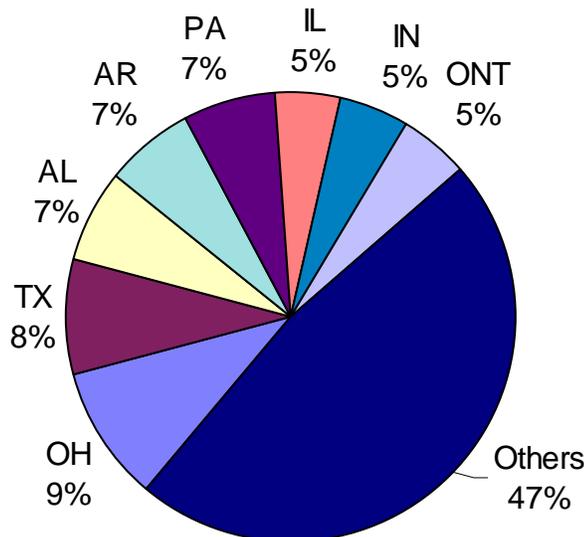


Figure 2 - Location of Plants Surveyed

Customized Database

A customized database was developed from the data obtained in this survey. In order to perform an analysis of this data, numerous spreadsheets and other reports were also generated. For example, Appendices 1 – 51 of this report summarize the data obtained in the profile reports in a tabular format. These Appendices are organized by issue and generally follow the organization of the survey questionnaire (Appendix 52). Data within each Appendix is organized by survey number. This permits convenient comparison of the responses of the EAF Melt Shops surveyed. In order to fully understand the basis of the information supplied in the Appendices, it will be helpful to refer to the appropriate question as it appears in the questionnaire or Profile Report.

Guidelines to interpreting the data in the figures:

1. When a number appears in parenthesis below (or beside) the “X” axis of a figure, this number refers to the total number of plants that responded to this issue.
2. When a number appears on the “X” axis and is referred to as “Survey #”, this identifies the particular plant surveyed. The plant that is identified by this “Survey #” is indicated in Appendix 1.
3. If a number appears in parenthesis besides a percentage in the text, this indicates the number of EAF shops that that percentage represents.