

Module 100 – Lesson One: INTRODUCTION TO METALFORMING

Lesson Description:

A basic introduction to metalforming (stamping, press brake, roll and slide forming, spinning, etc.). Review of metalforming products/parts, applications and uses in modern society. Introduction to common metalforming terms and jargon. Tour of (or orientation to) metalforming shop equipment and tooling, raw materials, process planning, production/fabrication methods and quality control instruments (CMM, OP, etc.). Review of company organizational structures and jobs. *Prerequisite:* Diagnostic Reading Ability Assessment. **Note:** Lesson required for NIMS Level 1 Credential.

Learning Objectives:

At the completion of this lesson, the student will be able to:

- ◆ Define “metalforming” and explain the basic differences between metal stamping, sheet metal fabrication, slide forming, metal spinning and roll forming.
- ◆ Identify and present to class one common (everyday) product/part made from three (3) different metalforming processes.
- ◆ Identify common key terms used in the industry (i.e., setup, tooling, stock, forming, blanking, piercing, coining, drawing, piece-parts, slugs, scrap, process plan and inspection sheet).
- ◆ Identify major components of one common metalforming machine and auxiliary equipment and explain their role in that metalforming process.
- ◆ Explain the major departments or functional areas/units of a metalforming company and how they affect and interact with other areas, units or departments.

Methods of Instruction:

Lecture, videos, tour/shop floor orientation, simulations/role plays and real-world examples.

Methods of Evaluation:

Group presentations, individual written/oral reports, and written quizzes/tests (*PROficiency Assessment*) during and after training.

Lesson Materials Provided by PMA:

- ◆ *NIMS Metalforming National Skill Standards - Level 1* (one for instructor)
- ◆ *NIMS Metalforming - Level 1 Credentialing Achievement Records* (one for each student)
- ◆ PMAEF Study Sheet - *Glossary of Terms Used in Metalforming and Metal Fabrication*
- ◆ PMAEF Video: “*Careers in Metalforming*”
- ◆ PMAEF Video: “*Introduction to Metalforming*”
 - Introduction to the Stamping Press*
 - Turn to Metal Spinning*
 - Introduction to the Press Brake*
- ◆ Student Handouts and Overhead Transparencies
- ◆ PMA Publication: *At Work* (one for each student)
- ◆ Tour Guide and PMAEF Safety Glasses (one for each student)
- ◆ PMAEF *Instructor’s Guide* with *SMART* Lesson Plans and Reference Materials
- ◆ PMAEF Item Bank (assessment questions)

Lesson Topics & Content Outline:

- ◆ **Introduction to Metalforming**
 - Program Introduction and Curriculum Orientation.
 - History of Metalforming & Introduction to Metalforming Today.
 - Getting a NIMS Metalforming Level 1 Credential.
 - Common Metalforming Products, Parts and Piece-Parts.

- ◆ **Introduction to Metalforming Machinery, Equipment & Components**
 - Common Terms, Vocabulary and Abbreviations Used in Metalforming.
 - Basic Metalforming & Fabrication Processes and Applications.
 - Common Metalforming Machinery and Equipment Characteristics.
 - Equipment Components and Auxiliaries.
 - Raw Materials Used in Metalforming.
 - Types of Tooling and Their Function(s).
 - Overview of Job Planning, Setup, Production and the Inspection Process.

- ◆ **Metalforming Companies and Organizational Structure ***
 - Types of Metalforming Companies (fabrication, job-shop, assembly, small lot, etc.).
 - Departments (Functional Areas) and Organization of a Metalforming Company.

- ❖ **Final Exam (*PRO*iciency Assessment)**
- ❖ **Review Results of Diagnostic Reading Ability Assessment**

☞ Note: See individual *SMART* Lesson Plans contained in the Instructor Guide for detailed lesson content, flow of lesson, and in-training assessments (*PRO*iciency Practices and *Skill Checks*). * A metalforming plant/shop tour is required for this topic (PMAEF safety glasses provided in box for each student).