	NORTH CAROLINA DEPARTMENT OF LABOR		No. 31-2
	OSH DIVISION		Date: 10/2009
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Industry: **Leather Products**

Sub-Group: **Footwear**

SIC: **3131, 3142, 3143, 3144 and 3149**

NAICS: **316999, 316212, 316213, 316214 and 316219**

PROCESS DESCRIPTION: There are three basic types of construction common to all footwear production:

- 1) cemented in which the sole and/or heel is attached by adhesion
- 2) molded in which the whole shoe or just the sole and heel are mold formed and attached to the shoe bottom and
- 3) sewn in which the sole is attached by a stitched seam.

The cemented and sewn types are common to leather shoes.

The manufacturing process, in sequence, is:

Cutting – leather requires a single layer cutting of shoe parts, normally by dies made from hand produced patterns,

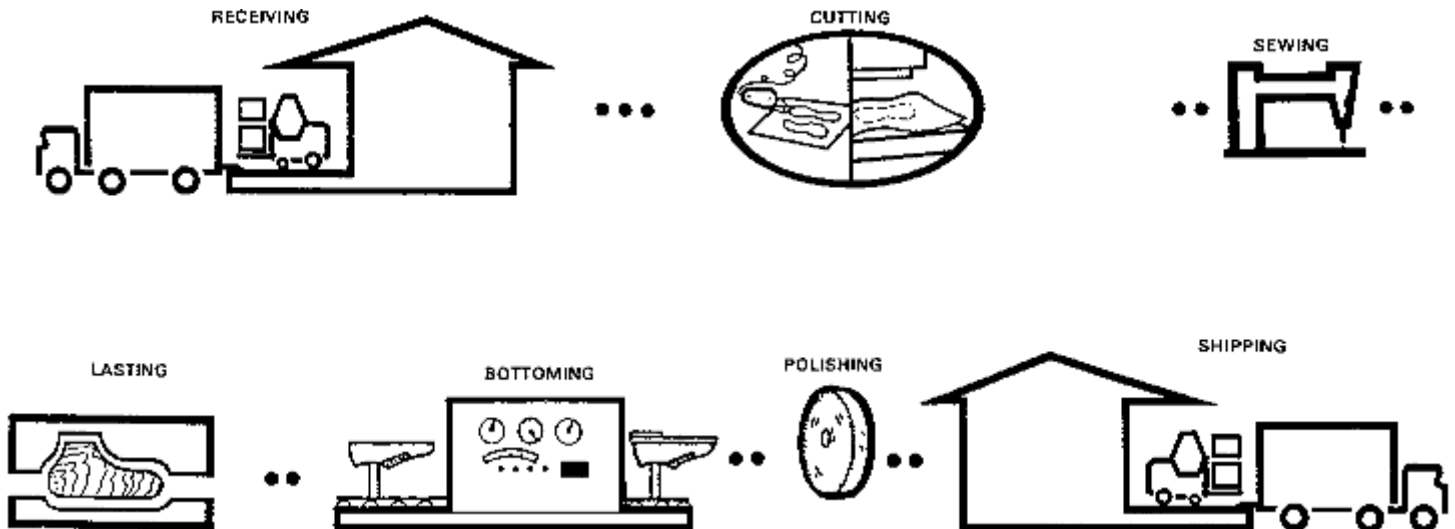
Fitting – the stitching together of various parts of the upper shoe or heat welding may be substituted by use of a high frequency (HF) thermocouple machine,

Lasting – a series of shaping operations while assembled components are drawn tightly over a wood form and fastened to an insole,

Bottoming – attaching the sole by stitching or cement, and

Finishing – cleaning, filling and polishing by hand or machine for appearance and preservation.

PROCESS FLOW:




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Hazards Analysis

Major Hazards			Other Hazards		
Location	Item	Hazard	Location	Item	Hazard
Throughout	Cements and adhesives Skin contact with cements & adhesives	Inhalation of vapors, overexposure Dermatitis	Bottoming	Chemical Vapors	Inhalation, overexposure
Cutting and Stitching	Points of operation such as cutters, trimmers, splitters, sewing machines	Amputations and crushed limbs	Throughout	Mechanical power transmission apparatus	Amputation and crushed limbs
Finishing and stitching	Noise	Hearing loss		Housekeeping Powered Industrial Trucks	Slips trips and falls Carbon Monoxide exposure, accidents
Fitting and lasting	HF Thermocouple machines	Burns from steam			
Receiving	Removal of bands on bales/rolls leather	Eye and face lacerations			

Key OSHNC Standards

Reference	29 CFR 1910 — General Industry Standards
Subpart I	Personal protective equipment
Subpart O	Machinery and machine guarding
1910.95	Occupational noise exposure
1910.147	Control of hazardous energy (lock-out/tag-out)
1910.176	Materials handling
1910.178	Powered industrial trucks
1910.1000	Air contaminants
1910.1200	Hazard Communication

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Inspection Analysis		
<p>The inspection should begin in the receiving area, checking especially for stacking procedures (rolls or bales normally encountered) and use of industrial trucks. Opening procedures must be observed for use of eye and face protection. All operations, beginning with the cutting process, must receive continued emphasis for properly guarded machinery and power transmission apparatus, rotating parts and points of operation. Additionally, drives of all machinery must be noted, particularly where HF Thermocouple Heating machines are in use near aisles and passageways, normally located in the Fitting Department. Finally, both noise and air contamination must receive careful attention, particularly in the Finishing and Stitching Departments where these hazards and high temperatures likely exist.</p>		
<p>Other Pertinent Comments: Although technically complex, and frequently secretive as to formula and/or process, the manufacturing of footwear may be simplified to sequential application as outlined in the Process Description. Some terms of value to the layman inspector are:</p> <p><u>Arch</u> – bottom curve of shoe last <u>Ball</u> – part of last just back of the toe position <u>Chainstitch</u> – single stitch, single needle operation <u>Clinker</u> – also known as <u>Dinker</u> – machine that cunts upper parts of shoe and/or embosses them <u>Folding</u> – turning over the edge of a part to form a finished surface (usually hand operation) <u>Setting</u> – forming over last by heat <u>Last</u> – wood form for shoe <u>Making</u> – final shoe preparation <u>Roughing</u> – preparation for attaching sole of shoe</p>		