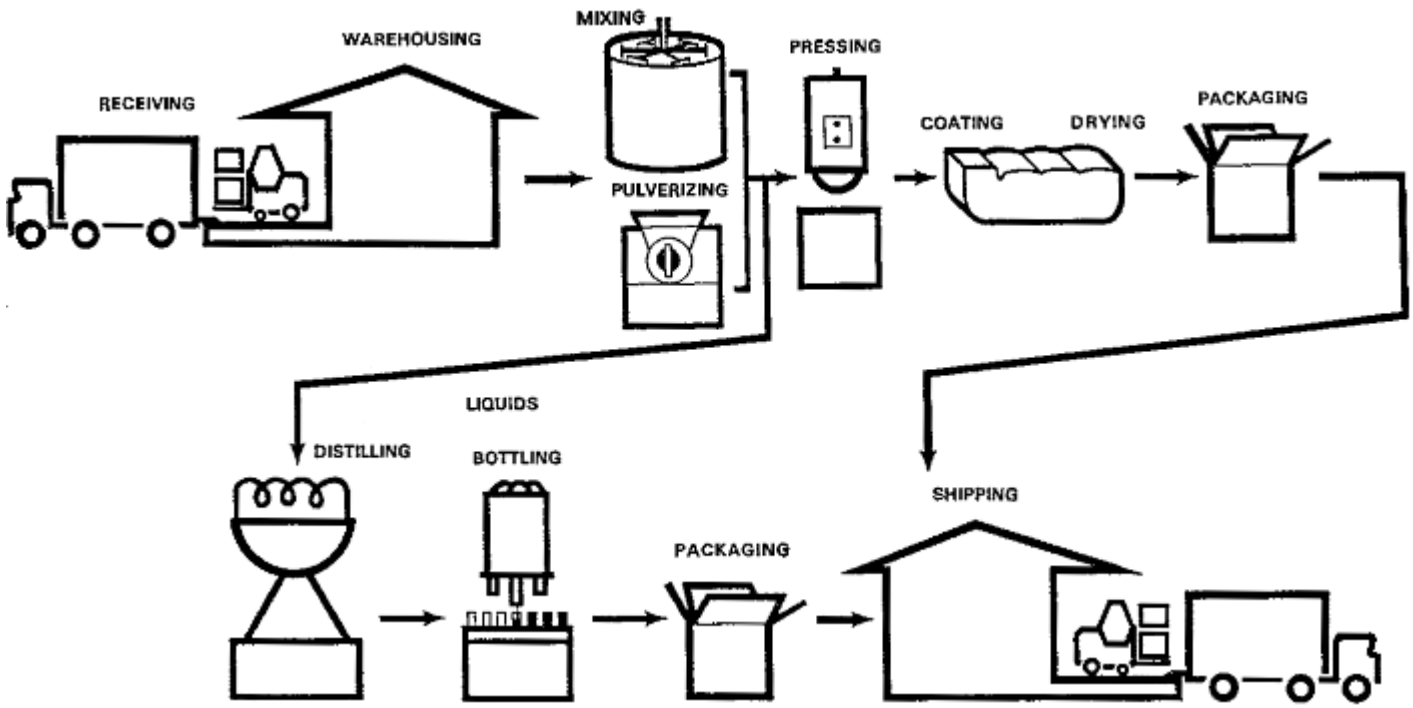
NCDOL N.C. Department of Labor	**NORTH CAROLINA DEPARTMENT OF LABOR**	**No. 28-2**
	OSH DIVISION	**Date: 10/2009**
	OSHNC INDUSTRIAL DATA REPORT	**Pages: 3**

Industry: **Chemicals and Allied Products**	Sub-Group: **Drugs**
SIC: **2833, 2834, 2835 and 2836**	NAICS: **325411, 325412, 325413 and 325414**

PROCESS DESCRIPTION: Drugs are generally processed as solids or liquids. Solids are processed by simple mixing or blending of basic medicinal ingredients with binders and pressed into tablet form. Tablets are then tumbled in wax and sugar, dried and wax coated to provide a hard outer shell. Processing could also include distilling, cooking, pulverizing, grinding, compounding, separating, sifting and drying of drugs. Liquid processes include many of the preceding with the addition of "cooking" in pressurized vessels under rigidly controlled temperature and humidity conditions. Packaging or filling normally utilizes automatic filling, conveying and packaging equipment.

PROCESS FLOW:



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Hazards Analysis

Major Hazards			Other Hazards		
Location	**Item**	**Hazard**	**Location**	**Item**	**Hazard**
Warehouse and manufacturing	Carboys, barrels and bags	Manual material handling causing back injuries, hernias, crushed extremities	Manufacturing	Chemicals	Carcinogens: (especially: Ethyleneimine, Beta-Propiolactone, Vinyl Chloride, Methyl Cloromethyl ether, Bis-Chloromethyl ether, and Benzidine)
				Machinery	Exposed points of operation
				Glass containers	Lacerations while cleaning
Manufacturing	Piping and manufacturing	Hot liquids and surfaces-scalds and burns	Laboratory	Animals	Bites and disease
				Chemicals, liquids	Burns and eye injuries from pouring
	Acids and alkalies	Skin burns and inhalation of toxic vapors			
	Machinery noise	Hearing loss			
	Dust	Explosive atmosphere and inhalation of toxic material			
	Highly flammable volatiles	Fire and explosion; inhalation, ingestion and skin absorption of toxic materials			
	Radioactive material	Overexposure of ionizing radiation			
			Throughout	Housekeeping	Slips, trips or falls

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Key OSHNC Standards

Reference	29 CFR 1910 — General Industry Standards
Subpart D	Walking and working surfaces
Subpart E	Exit Routes, Emergency Action Plans, and Fire Prevention Plans
Subpart I	Personal protective equipment
1910.95	Occupational noise exposure
1910.106	Flammable and combustible liquid handling and storage
1910.119	Process safety management
1910.146	Permit required confined space entry
1910.147	Control of hazardous energy (lockout/tagout)
1910.151	Medical services and first aid (especially eye wash and emergency shower stations)
1910.176	Handling materials – general
1910.178	Powered industrial trucks
1910.212	Machine guarding - general
1910.1000	Air contaminants
1910.1003	13 carcinogens
1910.1017	Vinyl chloride
1910.1200	Hazard Communication

Inspection Analysis

Chemicals are received from suppliers in bulk form as well as individual containers. Inspection must cover receiving docks and material handling apparatus. The manufacturing area is the prime area for explosion hazards and for respiratory problems, allergies, toxic retains, dermatitis and other occupational diseases. Ascertain whether any carcinogens are being used and if personal protective equipment and eye and body wash facilities are provided where acids and alkalis are being used. Mechanical mixing, grinding, and packaging equipment must be inspected for point of operation, rotating parts and in-running nip point guarding.

Laboratory facilities will contain all hazards prevalent in manufacturing in addition to biological test animals with related disease and sanitation problems.

Other Pertinent Comments: The NCDOL Library has the *Encyclopedia of Chemical Technology 4th ed TP9.E685* which explains how chemicals are used in this industry today. There are 25,000 potentially toxic chemicals (677 with TLVs and approximately 600 PELs). Toxic effects often are not evident for 10-20 years.