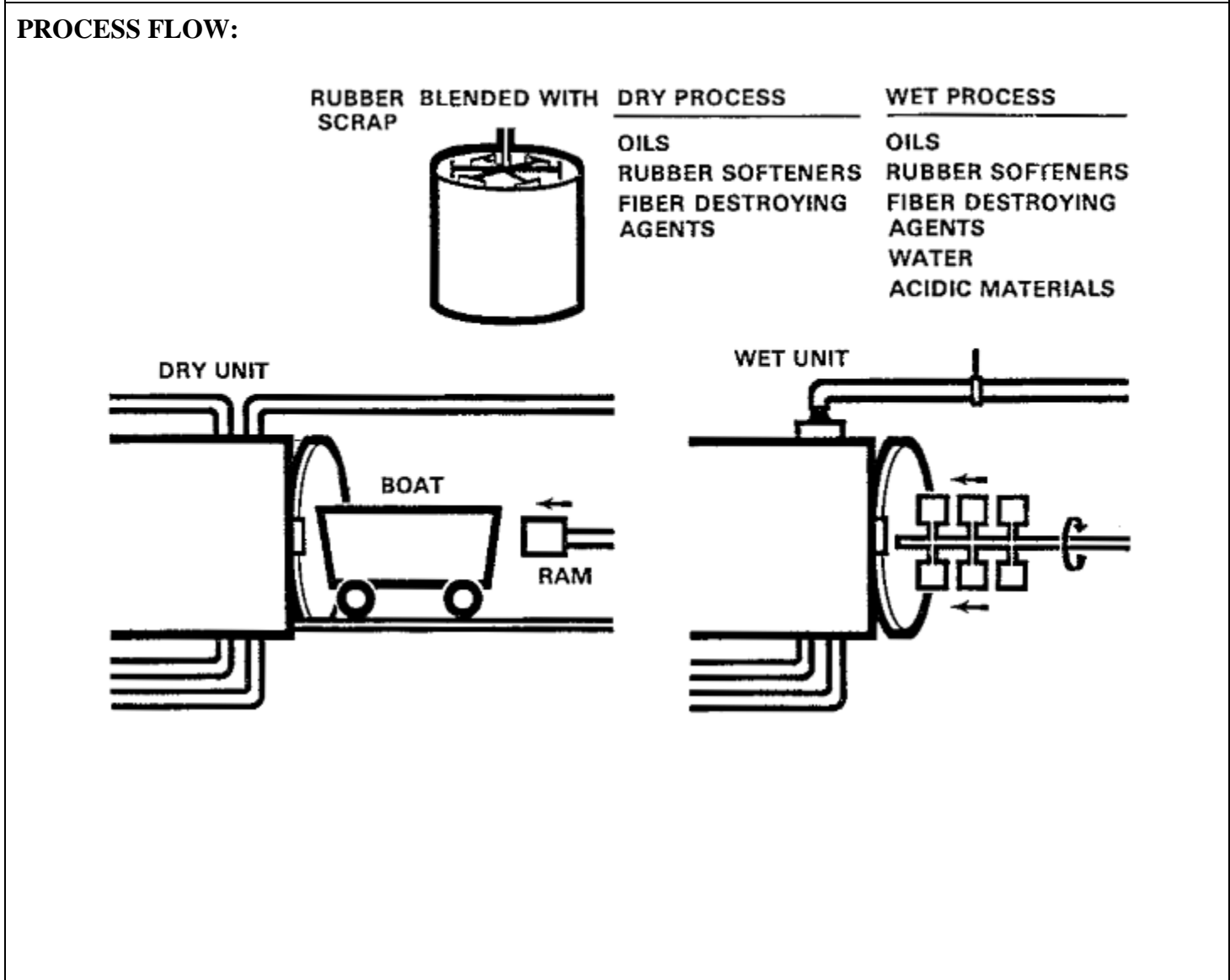



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|  NCDOL <small>N.C. Department of Labor</small> | NORTH CAROLINA DEPARTMENT OF LABOR | | No. 30-2 |
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| | |
|----------------------------------|------------------------------------|
| Industry: Rubber Products | Sub-Group: Reclaimed Rubber |
|----------------------------------|------------------------------------|

| | |
|---------------------------|-------------------------------------------------------------------------|
| SIC: formerly 3031 | NAICS: 316211, 325212, 326192, 326220, 326291, 326299 and 339943 |
|---------------------------|-------------------------------------------------------------------------|

PROCESS DESCRIPTION: Reclaimed rubber is replasticized into useful rubber by devulcanizing, digesting or heating. The two types of devulcanization are dry and wet. The dry unit is a steel pressure vessel 7 feet in diameter by 40 feet long, sometimes with shelves. The materials are stacked or pushed in by boat with a mechanical ram. Rubber scrap is mixed with oils, rubber softeners and fiber-destroying agents. After loading into the unit, steam is admitted for a predetermined time period (hours). Pressure is vented and the material is removed. The wet unit is a vertical or horizontal steel plate vessel with a power-driven agitator. The rubber plus water, oils, rubber softeners, fiber-destroying agents and acidic materials are placed in the unit, steam is added and the agitator is started. Again, pressure is vented after a predetermined time period and the material is removed.



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Hazards Analysis

| Major Hazards | | | Other Hazards | | |
|--------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|----------------|-----------------------------------------------------------|
| Location | Item | Hazard | Location | Item | Hazard |
| Throughout | Mechanical power transmission apparatus | Amputations and crushed limbs | Throughout | Housekeeping | Slips, trips and falls |
| Blending area | Materials and chemicals | Skin, eye, respiratory irritation, burns, inhalation, overexposure | Blending and vulcanizing area | Organic vapors | Inhalation, overexposure, skin and respiratory irritation |
| Devulcanizing area | Devulcanizers | Unguarded parts, inadvertent start up, skin or eye irritations, fire involving oils or flammable liquids | | | |
| Throughout | Heavy materials | Strains, crushed limbs | | | |


Key OSHNC Standards

| Reference | 29 CFR 1910 — General Industry Standards |
|-----------|--------------------------------------------------------|
| Subpart D | Walking and working surfaces |
| Subpart I | Personal protective equipment |
| Subpart O | Machinery and machine guarding |
| Subpart S | Electrical |
| 1910.94 | Ventilation |
| 1910.106 | Flammable and combustible liquids handling and storage |
| 1910.146 | Permit required confined space entry |
| 1910.147 | Control of hazardous energy (lockout/tagout) |
| 1910.178 | Powered industrial trucks |
| 1910.1000 | Air contaminants |
| 1910.1200 | Hazard Communication |

Inspection Analysis

SIC: formerly 3031

NAICS: 316211, 325212, 326192, 326220, 326291, 326299 and 339943

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The inspection should start in the receiving warehouse. Aisles must be clear and raw materials stacked properly. In the blending area, employees must be checked for use of personal protective equipment. Power transmission apparatus must be guarded and fire protection must be checked throughout. Upon entering the devulcanizing area, ventilation must be checked. Moving parts of devulcanizers must be guarded, interlocks must be provided on the doors and a written lockout program must be in operation. Design, construction and installation must be in accordance with boiler and presser vessel code. Any employee who works inside a vessel must be trained and competent, use a respirator and wear a rescue harness. All process piping connections must be disconnected or locked out.

Other Pertinent Comments: IDR 30-3, Fabricated Rubber, is closely related.