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| | **NORTH CAROLINA DEPARTMENT OF LABOR** | **No.** 22-3 |
| | **OSH DIVISION** | **Date:** 10/2009 |
| | **OSHNC INDUSTRIAL DATA REPORT** | **Pages:** 3 |

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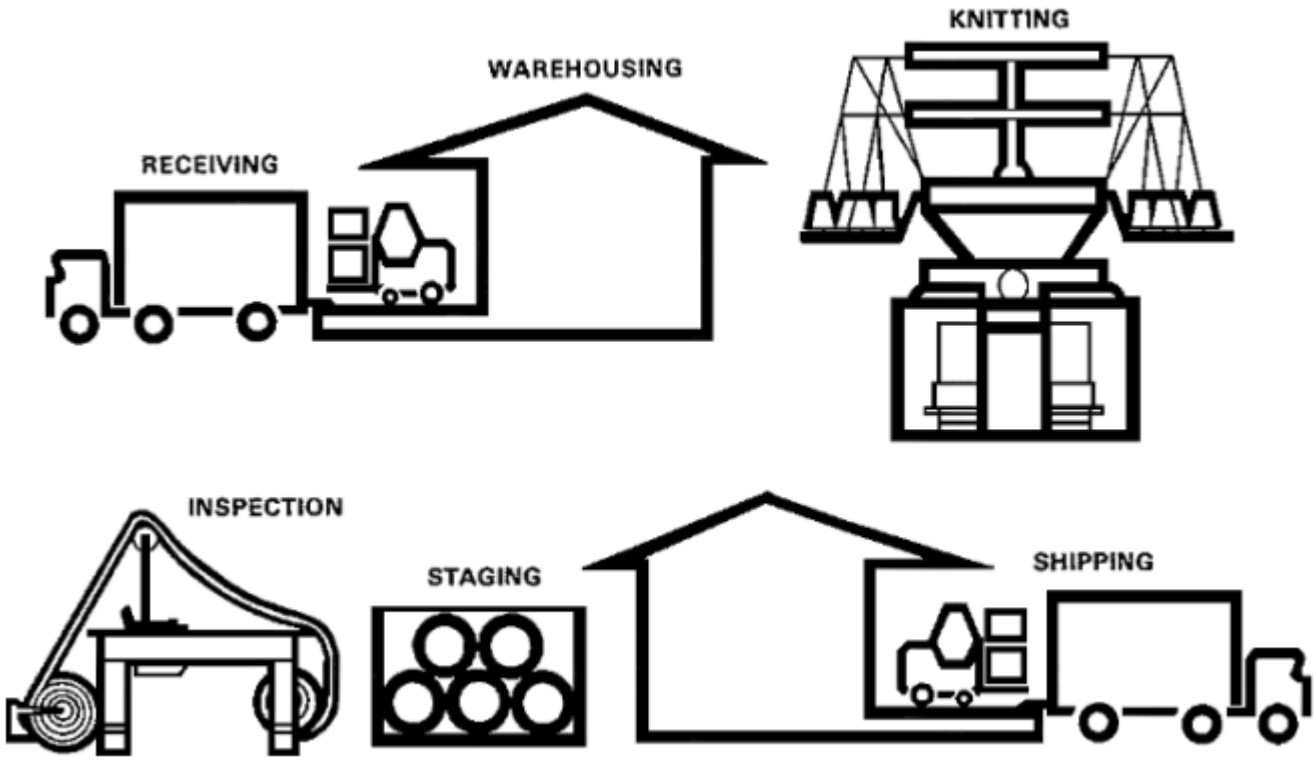
|---|---|
| Industry: **Textiles** | Sub-Group: **Circular Knitting** |
| SIC: **2252** | NAICS: **313312, 315111 and 315119** |

**PROCESS DESCRIPTION:** Finished yard is received on cones or tubes ranging in size from 1½ to 10 pounds. Varieties include cotton, cotton spun, polyester filament and nylon. Yard can also be plyed or in natural state. Yarn is warehoused and cataloged as to variety, texture, color, etc., and moved from warehouse to storage area by either pin truck or hand truck in selected quantities depending upon the color combination or texture desired in the finished product. The yard is then positioned on either an overhead creel or free standing creel located at the side of the knitting machine. From the creel, the yarn is placed on the knitting machine. There are several varieties of circular knitting machines in use. These include the single knit, double knit, full fashion, sweater, sliver and V-bed flats. In all cases the needles will function sequentially and the yarn is fed course-wise into the needles. There may be a minimum of 24 feeds and a maximum of over 100 per machine. From these feeds the yarn is threaded through tape wheels, finishing wheels or storage feeders. It then goes through another stop motion and ring selection before passing to the yarn carrier which holds it for the knitting needles. The knitted fabric is then formed and wound on the take down roll. After the rolls have accumulated approximately 20-50 pounds of knitted fabric they are removed from the machine and placed on a vehicle (either a buggy or truck) and transported to grading and inspection. Following inspection, the rolls are packaged as final knitting product for further processing.

**PROCESS FLOW:**



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## Hazards Analysis

| Major Hazards | | | Other Hazards | | |
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| **Location** | **Item** | **Hazard** | **Location** | **Item** | **Hazard** |
| Warehouse | Mechanical power transmission apparatus, fork lifts | Amputations and crushed limbs from contact with gears, shafts, pulleys, belts, chains and sprockets, carbon monoxide exposure, collisions and untrained operators | Knitting machine | Loose and broken needles<br>Falling rolls of yarn<br>Faulty ladder and improper use of ladder | Puncture wounds<br>Bruises and lacerations<br>Broken limbs and possible fall into rotating parts of machine |
| | Cases and cartons of yard and finished fabric | Falling potential of 100-300 pound cartons | | Rotating cloth roll and hand wheel | Amputations and lacerations |
| Throughout | Flyings and lint<br>Housekeeping, and oily floors | Fire hazard<br>Slipping, tripping or falling | Throughout | Material handling; lifting 40-50 lb rolls of fabric | Strained or sprained muscles; crushed fingers or toes |
| Knitting machine | Rotating pattern wheel | Amputation, cuts and lacerations | | | |

## Key OSHNC Standards

| Reference | 29 CFR 1910 - General Industry Standards |
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| NCGS 95-129 | General duty clause - ergonomics |
| Subpart D | Walking and working surfaces |
| Subpart E | Exit Routes, Emergency Action Plans, and Fire Prevention Plans |
| Subpart I | Personal protective equipment |
| Subpart O | Machinery and machine guarding – where 1910.262 does not apply |
| Subpart S | Electrical |
| 1910.141 | Sanitation |
| 1910.147 | Control of hazardous energy (lockout/tagout) |

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| 1910.176 | Handling materials - general |
| 1910.178 | Powered industrial trucks |
| 1910.262 | Textiles |
| 1910.1000 | Air contaminants |
| 1910.1200 | Hazard Communication |

## Inspection Analysis

The inspection should begin in the receiving area and the warehouse, by checking powered industrial truck operations, walking and working surfaces, and stacking of cases of yard and finished knitted fabric. The knitting machines must be inspected for proper guarding of power transmission apparatus and rotating parts (rotating cloth roll, hand wheel and pattern wheel). Employees must be carefully observed gaining access to and adjusting the upper stop motion of the circular knitting machine. In the event that spun cotton yarn is used for knitting, all wiring, motors and other electrical apparatus subjected to flyings and lint must meet Subpart S – Electrical. The floor area around the knitting machines and the positioning of the hand trucks or pin trucks must be free of slipping or tripping hazards. The inspection department shall be checked for material handling techniques. Material handling equipment must be checked in the shipping department. Check all employee exposures. Review lockout/tagout needs.

**Other Pertinent Comments:**