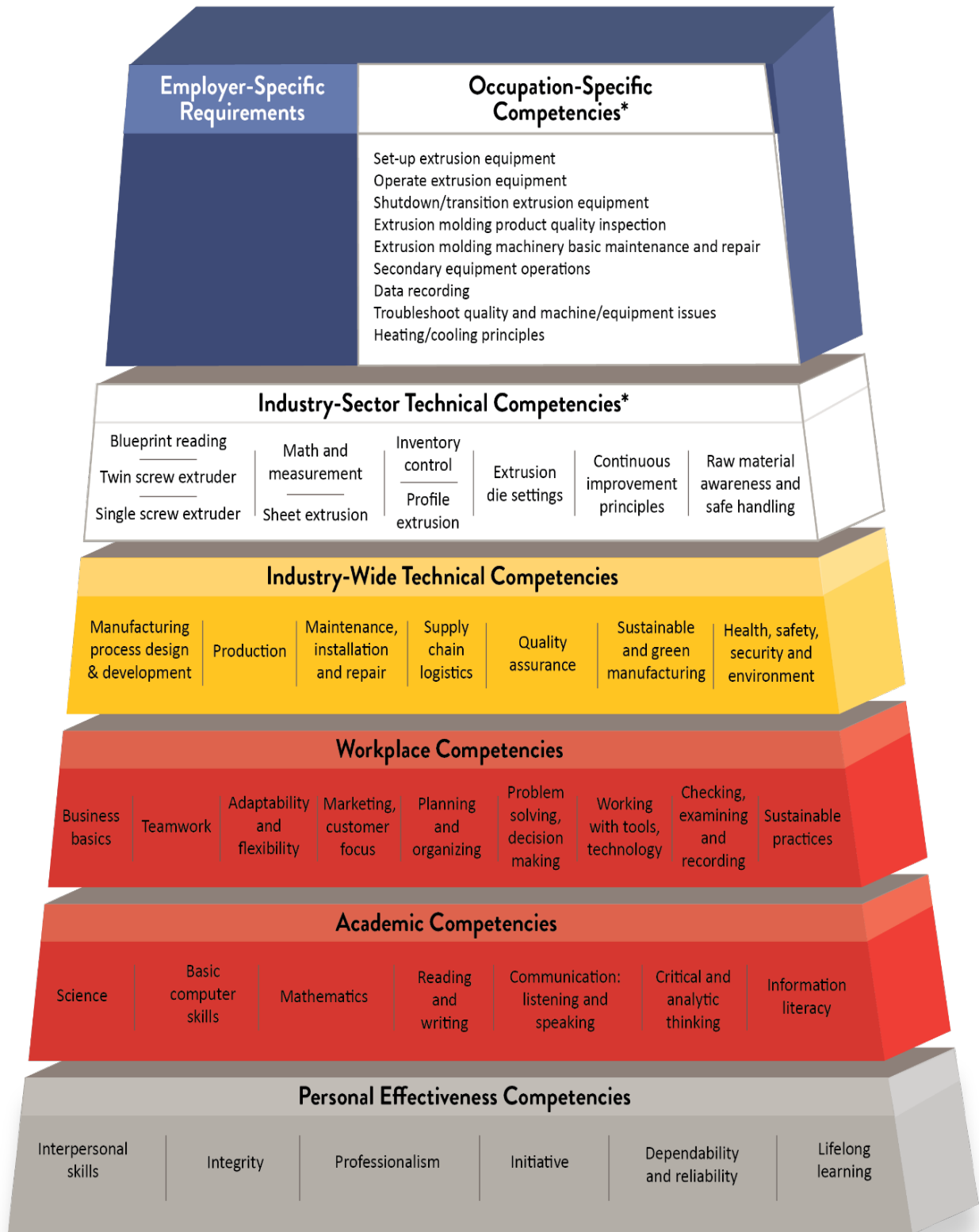


Minnesota Dual-Training Pipeline

Competency Model for Advanced Manufacturing

Occupation: Extrusion Molding Technician



Based on: Advanced Manufacturing Competency Model Employment and Training Administration, United States Department of Labor, April 2010.

*Pipeline recommends the Industry-Sector Technical Competencies as formal training opportunities (provided through related instruction) and the Occupation-Specific Competencies as on-the-job training opportunities.



Competency Model for Extrusion Molding Technician

Extrusion Molding Technician – This position is responsible for overseeing the operating of extrusion molding machines to guarantee that the parts produced are up to the standards set by the company and the customer. The Extrusion Molding Technician knows how to set up the extruder and co-extruder, troubleshoots problems in production, makes corrections, ensures quality controls and that the product readily works through any secondary equipment for cutting, shaping, etc. as well. Extrusion Molding Technicians also know how to ensure safe operation throughout entire set up, operation, shut down and any subsequent waste removal processes.

Industry-Sector Technical Competencies

Related Instruction for dual training means the organized and systematic form of education resulting in the enhancement of skills and competencies related to the dual trainee's current or intended occupation.

- **Blueprint Reading** – Develop the skills necessary to interpret working drawings common to the molding field.
- **Math and Measurement** – Knowledge to apply basic math skills, make accurate measurements, use conversion charts, and use measuring tools regarding various aspects of the extrusion process.
- **Inventory Control** – Training in how to manage stock materials as well as track and purchase necessary items to seamlessly support the overall manufacturing process.
- **Extrusion Die Settings** – Know how different dies and different settings can potentially impact how material is extruded in the manufacturing process.
- **Continuous Improvement Principles** – Understanding how to look for ways to minimize and reduce process wastes, to notice and correct machine abnormalities, to maintain records and to adapt to process changes such as cycle times, set-ups and tooling.
- **Raw Material Awareness and Safe Handling** – General understanding of the different raw materials possibly involved in extrusion molding and how certain machine settings, temperatures, etc. can potentially impact different materials and plastics. Know how to safely remove excess materials as well as how to manage any environmental concerns with material removal.

- **Single screw extruder** – Understanding of the basic processes for operating a single screw extruder device.
- **Twin screw extruder** – Understanding of the basic processes for operating a twin- screw extruder device.
- **Sheet extrusion** – Understanding of the basic processes such as monolayer vs. multilayer and different thicknesses in sheet extrusion.
- **Profile extrusion** – Understanding of basic processes to use machines that develop a shaped product in a variety of 3-D configurations that is not a sheet or film-based product.

Occupation-Specific Competencies

On-the-Job Training (OJT) is hands-on instruction completed at work to learn the core competencies necessary to succeed in an occupation. Common types of OJT include job shadowing, mentorship, cohort-based training, assignment-based project evaluation and discussion-based training.

- **Set-up extrusion equipment** – Ability to select correct tools, dies and materials, perform mechanical set-up according to company standards and equipment specifications, tests and validates set-up before going to full production.
- **Operate extrusion equipment** – Ability to operate extrusion molding equipment during production cycle, knowing how to monitor quality, monitor feedback controls and edge trimming systems, document processes and adjustments, monitor machine settings throughout, and safely operate machinery during entire production cycle.
- **Shutdown/ transition extrusion equipment** – Knowledgeable in how to safely and effectively shut down extrusion machining to maintain dies and lessen time necessary to transition to new production set-up while disassembling equipment and components if necessary.
- **Extrusion molding product quality inspection** – Demonstrate how to use quality assurance tools such as calipers, etc. to identify defects, confirm product is up to customer standards, and use appropriate tools to accomplish mold inspections.
- **Extrusion molding machinery basic maintenance and repair** – Know how to properly care for, store, operate and on occasion do routine maintenance for extruders and additive or filtration equipment associated with machinery operation.

- **Secondary equipment operations** – Know how to operate and troubleshoot the product on secondary equipment after it leaves the extruder such as saws, punchers, cutters, pull rolls, tapers, etc.
- **Data recording** – Know how to regularly maintain records of materials used, products made and timing for set-up, operation cycle time and change over to new / different product(s).
- **Troubleshoot quality and machine/ equipment issues** – Know how to strategically think through what may be causing quality defects as well as machine / equipment issues and quickly brainstorm and implement approaches to address these concerns.
- **Heating / cooling principles** – Know how to properly heat and/or cool down materials through polymer thermo-processing and/ or sheet extrusion methods that maintains safety while handling integrity of the overall product.

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