

Skills to Succeed Inventory

Virginia Peninsula Career Pathways in
Advanced and Precision Manufacturing Technologies
2012–2016

CAREER PATHWAY PROFILES



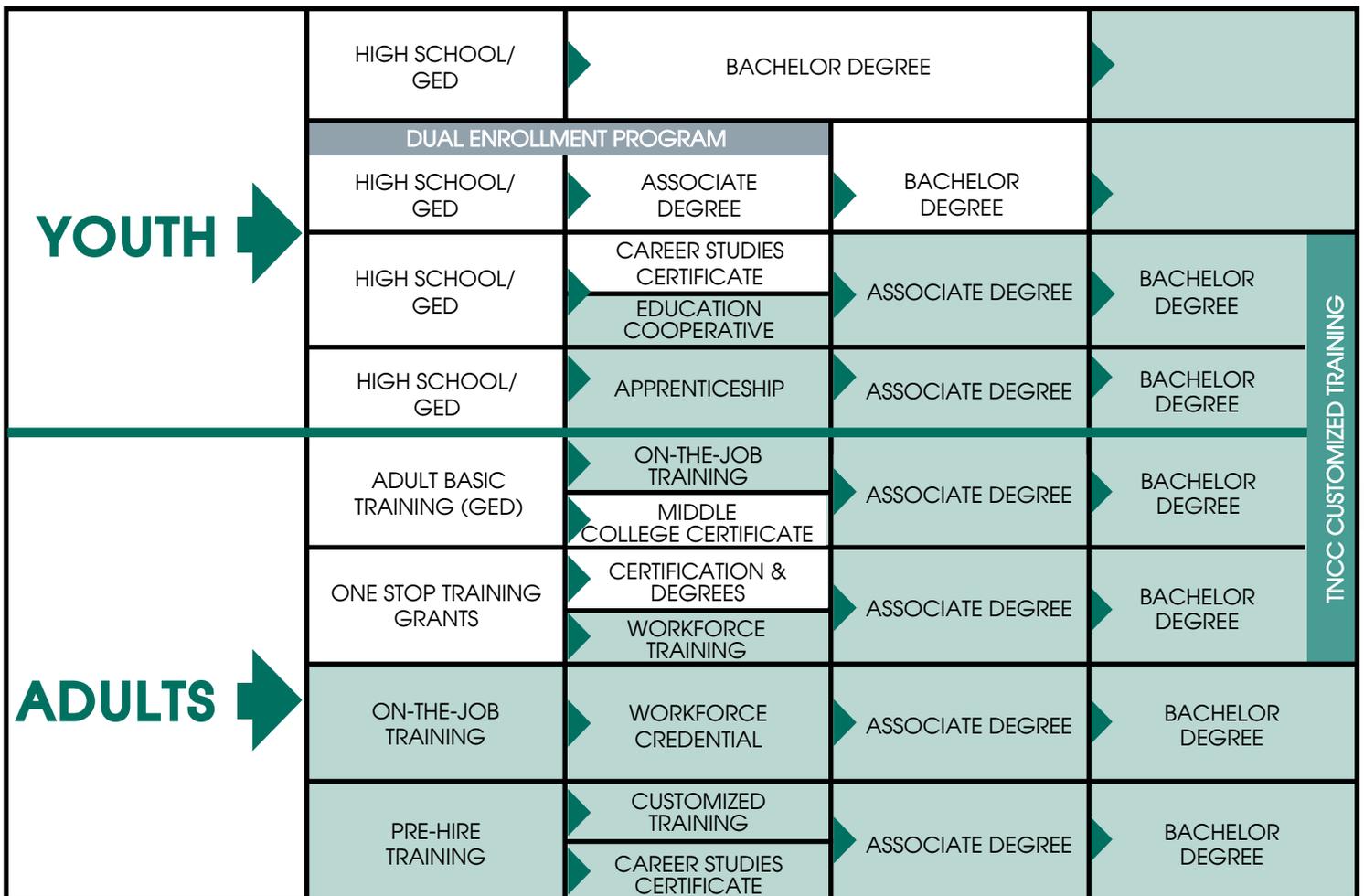
The Skills to Succeed Inventory is a comprehensive study of the careers in the Manufacturing Sector on the Virginia Peninsula with the 14 top companies, the more than 11,000 job openings expected in the 11 top careers, and the skill sets needed to get the jobs.

TARGET POPULATIONS AND CAREER PATHWAYS

The Skills to Succeed Inventory identified the target population to be 16 to 55 year old individuals who are under-skilled, unemployed or underemployed. Many of these are high school students, out-of-school youth, older youth and adults without a GED, dislocated workers, adult workers and personnel exiting the military. There are many career pathways for these potential workers to gain employment in these Science, Technology, Engineering and Math occupations (STEM).

Peninsula Workforce Development Manufacturing, Education & Training Career Pathways

 EMPLOYMENT



CURRENT PENINSULA CAREER PATHWAY OPPORTUNITIES WITH HIGH SCHOOLS, THOMAS NELSON COMMUNITY COLLEGE, NEW HORIZONS REGIONAL EDUCATION CENTER AND UNIVERSITIES.



“Career Pathways” is a strategy adopted at federal, state and local levels to support workforce transitions from education into and through the careers. Pathways are designed to increase competencies for America’s current and emerging workforce. This integrated array of programs and services develops academic, technical and work skills, provides ongoing education and training, and places workers in high-demand, high-opportunity jobs. With the rapid advances in technologies and processes, employers need workers who come prepared with the knowledge and skills necessary in today’s high-performance workplace.

Developed in partnership with secondary schools, community colleges, economic development agencies, employers, labor groups and community services, Career Pathways assists workers in learning about career ladders and lattices to progress into and through a career in both vertical movement within a job and lateral movement between related jobs. This information shows prospective workers their career potential beyond entry-level positions within an industry, helps focus workforce development endeavors, demonstrates the inter-connectedness of careers and informs workers of the education, training and skill development required to accomplish their career objectives.

To identify the demand for highly skilled workers, the competencies and training needed, the available workforce, and the skill gaps, the Peninsula Council for Workforce Development and Thomas Nelson Community College formed a strategic Career Pathways Partnership with manufacturers, the public schools, and community partners. Under a grant from the Ford Foundation and the Virginia Community Colleges, the collaborative conducted a

comprehensive labor market study in summer/fall 2011 with SOAR, Inc., a Piedmont Triad research firm, that involved two surveys of the major manufacturers and confidential in-depth interviews with executive and manpower planners at each company.

The Skills to Succeed Inventory is a comprehensive study of the careers in the Manufacturing Sector on the Virginia Peninsula with the 14 top companies. The Inventory resulted in 11 Career Pathway Profiles representing 11,150 jobs in Advanced and Precision Manufacturing Technologies on the Virginia Peninsula 2012–2016. The jobs are as follow:

- CNC and Robotics Operators – 350
- Coating Specialists (Surface Prep Technicians) – 1,300
- Electricians – 1,700
- Engineers – 200
- Fabricators (and Sheetmetal Workers) – 950
- Fitters – 1,600
- Machinists – 1,200
- Production and Account Managers – 150
- Pipefitters – 1,850
- Repair Technicians – 150
- Welders – 1,700

The following profiles provide a description of the career, essential skills, classroom training and on-the-job training (OJT) providers, application process, current employers, and current career pathways. Employers identified the numbers of job openings in each of the careers at their Peninsula locations in the next five years, and they specified the level of competencies needed in seven skill set areas:

- Technical Skills
- Computation Skills
- Communication Skills
- Technology (computer) Skills
- Workplace Skills
- Professional Skills
- Science Skills

The result of these profiles will be to engage industry and education in a discussion of how to re-engineer and expand current career pathways into these high demand, high opportunity jobs, and how to develop and fund new pathways to meet the expected demand for a highly qualified technical workforce.

These jobs are in the Skilled Trades and Precision Production Technologies. An additional study is expected to quantify some 1,000 additional higher end job openings coming available for engineering and related technicians in Advanced Manufacturing on the Peninsula in the coming years.

ELECTRICIANS

JOB FUNCTIONS

Install, maintain, and repair electrical wiring, equipment, and fixtures. Ensure that work is in accordance with relevant codes.

WAGES

Starting \$12.60/hr. \$26,200/yr.

Average \$20.35/hr. \$42,300 yr.

OPENINGS

1,700 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Vocational training, OJT, Apprenticeship or an AAS.

May require a Bachelor's degree.

ESSENTIAL SKILLS

Technical Skills

Equipment Selection: determining the kind of tools and equipment needed to do a job.

Installation: installing equipment, machines, wiring, or programs to meet specifications.

Quality Control Analysis: conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Communication

Follows directions correctly.

Communicates effectively with customers and fellow employees.

Listens well and applies what is learned.

Reads and applies safety warnings and simpler equipment instructions.

Writes sentences with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace.

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities, and cultural backgrounds. **Professional ethics:** abides by workplace policies and laws, and demonstrates personal integrity.

Personal hygiene and safety: follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks.

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Applied Math (5), Reading (4), Locating Information (5), Observation (5) and Applied Technology (5).

Gold Level: Applied Math, Reading for Information, Locating Information.

VIRGINIA PENINSULA TRAINING PROVIDERS

New Horizons Regional Education Centers with IBEW
Newport News Shipbuilding Apprentice School
Thomas Nelson Community College (certificate, apprenticeship)

Hampton University

Norfolk State University

Old Dominion University

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Ball Corporation, Pepsi Bottling, Newport News Shipbuilding, Printpack, Anheuser-Busch, Inc./InBev.

CAREER PATHWAY

Electricians learn through apprenticeship programs that typically last 4 years, each with 144 hours of classroom instruction and 2,000 hours of on-the-job training under the supervision of experienced electricians. Some people start their classroom training before seeking an apprenticeship. A number of public and private vocational-technical schools and training academies offer training to become an electrician. Employers often hire students who complete these programs and usually start them at a more advanced level. Licensing is required with continuing education that includes changes in code, safety training, and manufacturer-specific training. Electricians may specialize with additional classes on data, video, communications or energy systems. Experienced electricians can, with additional management and supervision training and well-developed communication skills, advance to jobs as supervisors, project managers or superintendents, and may eventually start their own contracting business. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

AAS = ASSOCIATES DEGREE

BS = BACHELORS DEGREE

OJT = ON-THE-JOB TRAINING

CNC AND ROBOTIC OPERATORS

JOB FUNCTIONS

Operate computer-controlled machines or robots to perform one or more machine functions on metal or plastic work pieces.

WAGES

Starting \$13.98/hr. \$29,100/yr.

Average: \$19.05/hr. \$39,600/yr.

OPENINGS

350 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

High School Diploma or equivalent, vocational training, and OJT.

ESSENTIAL SKILLS

Technical Skills

Judgment and Decision Making: consider the relative costs and benefits of potential actions to choose the most appropriate one.

Operation and Control: control operations of equipment or systems.

Operation Monitoring: watch gauges, dials, or other indicators to make sure a machine is working properly.

Repairing: repair machines or systems using the needed tools.

Troubleshooting: determine causes of operating errors and decide what to do about it.

Computation

Easily translates a word problem in to a computational one. Adds and subtracts whole numbers, including negative numbers. Changes numbers from one form to another using whole numbers, fractions, decimals or percentages. Converts simple calculations with money, volume, length, and weight. Adds, subtracts, multiplies, and divides all units of measurement. Combines ratio, rate, and percentage. Draws and interprets bar graphs. Performs mathematical calculations using decimals and fractions.

Communication

Follows directions correctly. **Communicates** effectively with customers and fellow employees. **Listens well** and applies what is learned. **Reads and applies** safety warnings and simpler equipment instructions. **Writes sentences** with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace. **Diversity awareness and application:** communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds. **Professional ethics:** Abides by workplace policies and laws and demonstrates personal integrity. **Personal hygiene and safety:** Follows safety guidelines and manages personal health.

Professional Skills

Personal appearance: appears neat and clean and presents well as a job applicant or employee or candidate seeking promotion.

Time and resource management: punctual, timely with work deadlines, manages time and other resources well. **Lifelong learning:** demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively. **Positive work ethic:** arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks. **Reasoning, problem solving:** identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks. **Locating information:** knows how to research, locate, and ethically apply reliable information to solve problems. **Systems thinking:** understands his or her role in fulfilling the mission of this workplace. Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership techniques, production methods and coordination of people and resources.

ACT WORKKEYS JOB PROFILE

Applied Math (5), Reading for Information (4), Locating Information (5), Observation (4) and Applied Technology (5)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School
Thomas Nelson Community College (certificate)

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Alcoa-Howmet Hampton, Canon Virginia, Inc.,
Continental AG Newport News (Siemens VDO)

CAREER PATHWAY

Computer control programmers and operators train in various ways—in apprenticeship programs, informally on the job, and in secondary, vocational, or postsecondary schools. The more skills needed for the job, the more education and training are needed to qualify. Many entrants have previously worked as machinists or machine setters, operators and tenders. Entry-level CNC machine operators may need at least a few months of on-the-job training to reach proficiency. Computer control programmers or operators need high school or vocational school courses in trigonometry and algebra, blueprint reading, computer programming, metalworking and drafting. As new technology is introduced, computer control programmers and operators receive additional training, often provided by a representative of the equipment manufacturer or a local technical school. Many entrants to these occupations have experience working as machine setters, operators, and tenders or machinists. Persons interested in becoming computer control programmers or operators should be mechanically inclined and able to work independently and do highly accurate work. Experienced CNC operators may become CNC programmers or machinery mechanics, and some are promoted to supervisory or administrative positions in their firms. Some highly skilled workers move into tool and die making, and a few open their own shops.

Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010–11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

ENGINEERS/ENGINEERING TECHNICIANS

Design, Electrical, Industrial, Mechanical

JOB FUNCTIONS

Apply knowledge of materials and engineering theory and methods to design, integrate, and improve manufacturing systems or related processes. May work with commercial or industrial designers to refine product designs to increase productivity and decrease costs.

WAGES

Starting \$21.99/hr. \$45,700/yr.

Average: \$42.94/hr. \$89,300/yr.

OPENINGS

200 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Associate's or Bachelor's Degree

CERTIFICATIONS

SME

ESSENTIAL SKILLS

Technical Skills

Engineering: knowledge of the practical application of engineering science and technology. This includes applying principles, techniques, procedures and equipment to the design and production of various goods and services.

Equipment Maintenance: performing routine maintenance on equipment and determining when and what kind of maintenance is needed.

Equipment Selection: determining the kind of tools and equipment needed to do a job.

Judgment and Decision Making: considering the relative costs and benefits of potential actions, choose the most appropriate one.

Operation and Control: controlling operations of equipment or systems.

Operation Monitoring: watching gauges, dials, or other indicators to make sure a machine is working properly.

Operations Analysis: analyzing needs and product requirements to create a design.

Quality Assurance: e.g., SPC, ISO, supplier certification

Quality Control Analysis: conducting tests and inspections of products, services or processes to evaluate quality or performance.

Systems Analysis: determining how a system should work and how changes in conditions, operations and the environment will affect outcomes.

Systems Evaluation: identifying measures or indicators of system performance and the actions needed to improve or correct performance, relative to the goals of the system.

Technology Design: knowledge of design techniques, tools and principles involved in production of precision technical plans, blueprints, drawings and models.

Troubleshooting: determining causes of operating errors and deciding what to do about it.

Computation

Easily translates a word problem in to a computational one.

Adds and subtracts whole numbers, including negative numbers.

Changes numbers from one form to another using whole numbers, fractions, decimals or percentages.

Converts simple calculations with money, volume, length and weight.

Adds, subtracts, multiplies and divides all units of measurement.

Combines ratio, rate and percentage. Draws and interprets bar graphs. Performs mathematical calculations using decimals and fractions.

Calculates area, perimeter and volume of various shapes (rectangle, triangle and circle). Solves calculations with two unknowns. Plans jobs using complex measurement (simple fractions of a millimeter) and coordinate geometry. (Basic geometry)

Utilizes applications that require right triangle trigonometry, solving systems of equations in 3 variables, solving quadratic equations; simplifying radicals, simplifying rational expressions; utilizing positive exponents

Solves problems of velocity, acceleration and variable change using calculus (derivatives and/or integration involving 2 variables) in the workplace; topics may include optimization, linear approximation, velocity.

Collects data for statistical analysis.

Applies statistical analysis of data, topics to include any of the following: analysis of variance, correlation and regression, hypothesis testing, sample size, estimating population mean and variance, statistical process control. Solves electrical power and associated problems.

Works with advanced calculus and statistics. Uses mathematics to solve engineering problems.

Communication

Communicates effectively with customers and fellow employees and speaks well extemporaneously when called on to describe a complex situation in an understandable manner. Articulates problems and participates in panel discussions and debates. Listens well and applies what is learned.

Reads and applies safety warnings and simpler equipment instructions and uses manuals and follows directions to solve problems. Reads and applies information from professional and technical journals, financial reports, and legal documents. Utilizes data and research to synthesize and extrapolate information to forecast needs or problems and project implications.

Follows written reporting procedures to write simple unformatted reports for internal-to-the-company consumption, and letters, summaries and reports for external-to-the-company consumption correctly with minimum errors of grammar, spelling and punctuation. Translates situations into verbal and written descriptions to clarify problems through commentaries, analysis and critiques.

Science

Chemistry: knowledge of the chemical composition, structure, and properties of substances and of the chemical processes and transformations that they undergo. This includes uses of chemicals and their interactions, danger signs, production techniques and disposal methods.

Physics: knowledge and prediction of physical principles, laws, their interrelationships and applications to understanding fluid, material, and atmospheric dynamics, and mechanical, electrical, atomic and sub-atomic structures and processes.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace.

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities, and cultural backgrounds.

Personal financial literacy: manages personal finances, budgeting and savings.

Professional ethics: abides by workplace policies and laws and demonstrates personal integrity.

Personal hygiene and safety: follows safety guidelines and manages personal health.

Technology Skills

Computer hardware basics: can set up and connect computer and printer and troubleshoots minor problems as needed.

Data and file management: maintains organized business files and follows management systems and appropriate security practices.

Internet use and safety: uses the Internet appropriately for work-related projects.

Software applications: learns computer applications as needed to do job.

Telecommunications: uses communications devices efficiently.

Professional Skills

Personal appearance: appears neat and clean and presents well as a job applicant or employee or candidate seeking promotion.

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Lifelong learning: demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks.

Reasoning, problem solving: identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks.

Locating information: knows how to research, locate, and ethically apply reliable information to solve problems.

Systems thinking: understands his or her role in fulfilling the mission of this workplace. Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership techniques, production methods and coordination of people and resources.

ACT WORKKEYS JOB PROFILE

Silver level: Applied Math (4), Reading for Information (4), Locating Information (4) and Observation (4)

VIRGINIA PENINSULA TRAINING PROVIDERS

New Horizons Regional Education Center
Newport News Shipbuilding Apprentice School
Thomas Nelson Community College (certificate, apprenticeship)
ECPI University
Old Dominion University

APPLICATION PROCESS

Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Alcoa-Howmet Hampton, Canon Virginia, Inc., Liebherr Mining Equipment Co. (Liebherr-America, Inc.), Continental AG Newport News (Siemens VDO), PrintPack, Inc. (Rampart Packaging Division)

CAREER PATHWAY

Engineers: Entry into engineering occupations generally requires at least a bachelor's degree in engineering, although those with 4-year degrees in physics, computer science or another technical area may qualify as well. Some positions, however, may require a master's or doctorate degree. Most advanced positions require a certain amount of relevant work experience.

Engineering Technicians: Most employers prefer to hire engineering technicians with a two-year associate degree or other postsecondary training in engineering technology. Training is available at technical institutes, at community colleges, at extension divisions of colleges and universities, at public and private vocational-technical schools and in the Armed Forces. Although it may be possible to qualify for certain engineering technician jobs without formal training, workers with less formal engineering technology training need more time to learn skills while on the job. Prospective engineering technicians should take as many high school science and math courses as possible to prepare for programs in engineering technology after high school. Vocational-technical schools, another source of technical training, include postsecondary public institutions that serve local students and emphasize training needed by local employers. Most schools that offer training to become an engineering technician require a high school diploma or its equivalent for admission. Many military technical training programs are highly regarded by employers, however, skills acquired in military programs are often narrowly focused and may be less applicable in civilian industry, which often requires broader training. Therefore, some additional training may be needed, depending on the acquired skills and the kind of job. Engineering technicians usually begin by performing routine duties under the close supervision of an experienced technician, technologist, engineer or scientist. As they gain experience, they are given more difficult assignments with only general supervision. Some engineering technicians eventually become supervisors. Source:

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011
<http://www.bls.gov/oco/>

MACHINISTS

JOB FUNCTIONS

Set up and operate a variety of machine tools to produce precision parts and instruments. Includes precision instrument makers who fabricate, modify or repair mechanical instruments.

WAGES

Starting \$15.66/hr. \$32,600/yr.

Average: \$21.05/hr. \$43,800/yr.

OPENINGS

1,200 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

High School Diploma or equivalent, vocational training, OJT or an AAS

ESSENTIAL SKILLS

Technical Skill

Equipment Selection: determining the kind of tools and equipment needed to do a job. **Installation:** installing equipment, machines, wiring or programs to meet specifications. **Operation and Control:** controlling operations of equipment or systems.

Operation Monitoring: watching gauges, dials or other indicators to make sure a machine is working properly. **Technology Design:** knowledge of design techniques, tools and principals involved in production of precision technical plans, blueprints, drawings and models. **Troubleshooting:** determining causes of operating errors and deciding what to do about it.

Computation

Easily translates a word problem in to a computational one. **Adds and subtracts** whole numbers, including negative numbers. **Changes numbers** from one form to another using whole numbers, fractions, decimals or percentages. **Converts simple calculations** with money, volume, length and weight. **Adds, subtracts, multiplies and divides** all units of measurement. **Combines** ratio, rate, and percentage. **Draws and interprets** bar graphs. **Performs mathematical calculations** using decimals and fractions. **Calculates** area, perimeter and volume of various shapes (rectangle, triangle and circle). **Solves calculations** with two unknowns. **Plans jobs** using complex measurement (simple fractions of a millimeter) and coordinate geometry. (Basic geometry) **Utilizes applications** that require: right triangle trigonometry, solving systems of equations in 3 variables, solving quadratic equations; simplifying radicals, simplifying rational expressions; and utilizing positive exponents.

Communication

Communicates effectively with customers and fellow employees. **Speaks extemporaneously** to describe complex situations in an understandable manner. **Listens well** and applies what is learned. **Reads** and applies safety warnings and simpler equipment instructions. **Applies information** from professional and technical journals, financial reports, and legal documents. **Follows directions** correctly. **Follows written reporting** procedures correctly to **write commentaries**, analysis and critiques in **complex sentences** with correct grammar, spelling and punctuation.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace. **Diversity awareness and**

application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds. **Professional ethics:** abides by workplace policies and laws and demonstrates personal integrity. **Personal hygiene and safety:** follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well. **Team player:** demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively. **Positive work ethic:** arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks. **Reasoning, problem solving:** identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks. **Systems thinking:** understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Silver level: Applied Math (4), Reading for Information (4), Locating Information (4) and Observation (4)

VIRGINIA PENINSULA TRAINING PROVIDERS

New Horizons Regional Education Centers
Newport News Shipbuilding Apprentice School
Thomas Nelson Community College (certificate)

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Advex Corporation, Davis Boat Works Inc., Continental AG
Newport News (Siemens VDO), Canon Virginia Inc.

CAREER PATHWAY

Machinists train in apprenticeship programs, vocational schools, community or technical colleges or informally on the job. Many entrants previously have worked as machine setters, operators or tenders. There are many different ways to become a skilled machinist. In high school, students should take math courses, especially trigonometry and geometry, and if available, courses in blueprint reading, metalworking and drafting. Due to the increasing use of computer-controlled machinery, basic computer skills are needed before entering a training program. After high school some machinists learn entirely on the job, but most acquire their skills in a mix of classroom and on-the-job training. Formal apprenticeship programs, typically sponsored by a union or manufacturer, are an excellent way to learn the job of machinist, but are often hard to get into. People interested in becoming machinists should be mechanically inclined, have good problem-solving abilities, be able to work independently and be able to do highly accurate work (tolerances may reach 50/1,000,000ths of an inch) that requires concentration and physical effort. Experience working with machine tools is helpful. Machinists can advance in several ways. Experienced machinists may become CNC programmers, tool and die makers or mold makers, or be promoted to supervisory or administrative positions in their firms. A few open their own machine shops. Source: Bureau of Labor Statistics, U.S.

Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011
<http://www.bls.gov/oco/>

MANAGERS ACCOUNT, GROUP, PRODUCTION SUPERVISOR

JOB FUNCTIONS

Plan, direct or coordinate the work activities and resources necessary for manufacturing products in accordance with cost, quality and quantity specifications.

WAGES

Starting \$26.65/hr. \$55,400/yr.

Average: \$41.98/hr. \$87,300/yr.

OPENINGS

150 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Associate's or Bachelor's Degree

ESSENTIAL SKILLS

Technical Skills

Judgment and Decision Making: considering the relative costs and benefits of potential actions choose the most appropriate one. **Quality Assurance:** e.g., SPC, ISO, supplier certification. **Troubleshooting:** determining causes of operating errors and deciding what to do.

Computation

Easily translates a word problem into a computational one. **Adds and subtracts** whole numbers, including negative numbers. **Changes numbers** from one form to another using whole numbers, fractions, decimals or percentages. **Converts simple calculations** with money, volume, length and weight. **Adds, subtracts, multiplies and divides** all units of measurement. **Combines** ratio, rate and percentage. **Draws and interprets** bar graphs. **Performs mathematical calculations** using decimals and fractions.

Communication

Communicates effectively with customers and fellow employees. **Articulates** problems and participates in team discussions and debates, speaking well before an audience. **Listens well** and applies what is learned. **Reads and applies** safety warnings and simpler equipment instructions. **Reads** and uses manuals and **follows directions** correctly to solve problems. **Writes** simple unformatted reports for internal company consumption and letters, summaries and reports for external consumption with good grammar and punctuation. **Translates** situations into verbal and written descriptions to clarify problems.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace. **Diversity awareness and application:** communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds. **Personal financial literacy:** manages personal finances, budgeting and savings. **Professional ethics:** abides by workplace policies and laws and demonstrates personal integrity. **Personal hygiene and safety:** follows safety guidelines and manages personal health.

Technology Skills

Data and file management: maintains organized business files and follows management systems and appropriate security practices. **Internet use and safety:** uses the Internet appropriately for work-related projects. **Telecommunications:** uses communications devices efficiently.

Professional Skills

Personal appearance: appears neat and clean and presents well as a job applicant or employee or candidate seeking promotion. **Time and resource management:** punctual, timely with work deadlines, manages time and other resources well. **Lifelong learning:** demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills. **Team player:** demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively. **Positive work ethic:** arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks. **Reasoning, problem solving:** identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks. **Locating information:** knows how to research, locate and ethically apply reliable information to solve problems. **Systems thinking:** understands his or her role in fulfilling the mission of this workplace. Knowledge of business and management principles involved in strategic planning, resource allocation, human resources modeling, leadership technique, production methods and coordination of people and resources.

ACT WORKKEYS JOB PROFILE

Silver level: Applied Math (4), Reading for Information (4), Locating Information (4) and Teamwork (4). Job Title in ACT Occupational Profile is Production Inspectors, Testers, etc.

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Alcoa-Howmet Hampton, Anheuser-Busch, Inc. / InBev., Alcoa-Howmet Hampton, Canon Virginia, Inc., Continental AG Newport News (Siemens VDO) PrintPack, Inc. (Rampart Packaging Division), Newport News Shipbuilding

CAREER PATHWAY

Because of the diversity of manufacturing operations, there is no standard preparation for this occupation. Most employers prefer to hire workers with a college degree in business administration, management, industrial technology or industrial engineering and who have experience in some part of production operations. Some companies will hire well-rounded graduates from other fields who are willing to spend time in production operations to gain experience before advancing to upper-management. Some managers start as production workers, then supervisors before being selected for management. To increase the chance of promotion, workers can expand their skills by obtaining a college degree, demonstrating leadership qualities or taking company-sponsored courses to learn additional skills. An increasing number of employers are looking for candidates with graduate degrees in industrial management or business administration, particularly for positions at larger plants where managers have more oversight responsibilities. Combined with an undergraduate degree in engineering, either of these graduate degrees is considered good preparation. Managers who do not have graduate degrees often take courses in decision sciences providing them with techniques and statistical formulas that can be used to maximize efficiency and improve quality. Although certification in various quality and management systems is not required for manager jobs, it may improve job prospects. A proven record of superior performance may lead to advancement to plant manager or vice president of manufacturing or to consulting. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

FITTERS

JOB FUNCTIONS

Fabricate, lay out, position, align, and fit parts of structural metal products.

WAGES

Starting 11.88/hr. \$24,700/yr.

Average 17.01/hr. \$35,400 yr.

OPENINGS

1,600 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

High school diploma or equivalent plus some postsecondary technical education and applied work experience (supervised apprenticeship, coop, internship or OJT)

ESSENTIAL SKILLS

Technical Skills

Equipment Selection: determining the kind of tools and equipment needed to do a job.

Operation and Control: controlling operations of equipment or systems.

Operation Monitoring: watching gauges, dials or other indicators to make sure a machine is working properly.

Quality Control Analysis: conducting tests and inspections of products, services or processes to evaluate quality or performance.

Computation

Easily translates a word problem into a computational one.

Adds and subtracts whole numbers, including negative numbers.

Changes numbers from one form to another using whole numbers, fractions, decimals or percentages.

Converts simple calculations with money, volume, length and weight.

Adds, subtracts, multiplies and divides all units of measurement.

Combines ratio, rate and percentage.

Draws and interprets bar graphs. Performs mathematical calculations using decimals and fractions.

Communication

Follows directions correctly.

Communicates effectively orally and written with customers and fellow employees.

Listens well and applies what is learned.

Reads and applies safety warnings and simpler equipment instructions.

Writes sentences with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace

Diversity awareness and application: communicates and

works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds.

Professional ethics: abides by workplace policies and laws, and demonstrates personal integrity.

Personal hygiene and safety: follows safety guidelines and manages personal health.

Professional Skills

Personal appearance: appears neat and clean and presents well as a job applicant or employee or candidate seeking promotion.

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Lifelong learning: demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way, is willing to take on additional tasks.

Reasoning, problem solving: identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks.

Locating information: knows how to research, locate and ethically apply reliable information to solve problems.

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Applied Math (5), Reading for Information (3), Locating Information (4) and Observation (5)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT REGIONAL EMPLOYERS OF RECORD

Newport News Shipbuilding,
Norfolk Navy Shipyard, BAE Systems

CAREER PATHWAY

Most plumbers, pipelayers, pipefitters and steamfitters train on the job through jointly administered apprenticeships and in career or technical schools or community colleges. Attainment of this certification may help people trained in this area to get more jobs and advance more quickly. Source:

Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010–11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

PIPEFITTERS

JOB FUNCTIONS

Lay out, assemble, install and maintain pipe systems, pipe supports, and related hydraulic and pneumatic equipment for steam, hot water, heating, cooling, lubricating, sprinkling and industrial production and processing systems.

WAGES

Starting \$11.31/hr. \$23,500/yr.

Average \$17.74/hr. \$36,900 yr.

OPENINGS

1,850 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Vocational training, OJT, or an AAS

ESSENTIAL SKILLS

Technical Skills

Installation: installing equipment, machines, wiring or programs to meet specifications.

Computation

Easily translates a word problem into a computational one.

Adds and subtracts whole numbers, including negative numbers. Changes numbers from one form to another using whole numbers, fractions, decimals or percentages.

Converts simple calculations with money, volume, length and weight.

Adds, subtracts, multiplies, and divides all units of measurement. Combines ratio, rate and percentage.

Draws and interprets bar graphs. Performs mathematical calculations using decimals and fractions.

Communication

Follows directions correctly.

Communicates effectively with customers and fellow employees.

Listens well and applies what is learned.

Reads and applies safety warnings and simpler equipment instructions.

Writes sentences with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace.

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds.

Professional ethics: abides by workplace policies and laws, and demonstrates personal integrity.

Personal hygiene and safety: follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way, is willing to take on additional tasks.

Reasoning, problem solving: identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks.

Locating information: knows how to research, locate and ethically apply reliable information to solve problems.

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Applied Math (4), Reading for Information (3), Locating Information (4), Observation (3) and Applied Technology (3)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Davis Boat, Newport News Shipbuilding

CAREER PATHWAY

Most plumbers, pipelayers, pipefitters and steamfitters train on the job through jointly administered apprenticeships and in career or technical schools or community colleges.

Attainment of this certification may help people trained in this area get more jobs and advance more quickly. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

REPAIR TECHNICIANS

JOB FUNCTIONS

Repair, test, adjust or install electronic equipment, such as industrial controls, transmitters, and antennas; keep machines, mechanical equipment, or the structure of an establishment in repair.

WAGES

Starting \$9.95/hr. \$20,700/yr.
Average \$15.70/hr. \$32,700/yr.

OPENINGS

150 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Requires an AAS or vocational training, or OJT

CERTIFICATIONS

AWS/ASME

ESSENTIAL SKILLS

Technical Skills

Equipment Selection: determining the kind of tools and equipment needed to do a job.

Judgment and Decision Making: considering the relative costs and benefits of potential actions to choose the most appropriate one.

Operation and Control: controlling operations of equipment or systems.

Repairing: repairing machines or systems using the needed tools.

Communication

Follows directions correctly.

Communicates effectively with customers and fellow employees.

Listens well and applies what is learned.

Reads and applies safety warnings and simpler equipment instructions.

Writes simple unformatted reports with good grammar and punctuation.

Reads and uses manuals to solve problems. Prepares simple letters, summaries, and originates reports for internal-to-the-company consumption.

Translates situations into verbal and written descriptions to clarify problems.

Speaks well before an audience.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities, and cultural backgrounds.

Professional ethics: Abides by workplace policies and laws, and demonstrates personal integrity.

Personal hygiene and safety: Follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Lifelong learning: demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks.

Reasoning, problem solving: identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

Evaluates quality or performance.

ACT WORKKEYS JOB PROFILE

Applied Math (5), Applied Technology (5), Reading for Information (4), Locating Information (5) and Observation (4)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CAREER PATHWAYS

Employers often prefer applicants with an associate degree in electronics from a community college or technical school, although a high school diploma may be sufficient for some jobs and professional certification often is required. Entry-level repairers may begin by working with experienced technicians who provide technical guidance and work independently only after developing the necessary skills. To become certified, applicants must meet several prerequisites and pass a comprehensive written or online examination. Certification demonstrates a level of competency and can make an applicant more attractive to employers, as well as increase one's opportunities for advancement. Experienced repairers with advanced training may become specialists or troubleshooters who assist other repairers diagnose difficult problems. Workers with leadership skills may become supervisors of other repairers. Some experienced workers

open their own repair shops. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011

<http://www.bls.gov/oco/>

FABRICATORS/SHEET METAL WORKERS

JOB FUNCTIONS

Fabricate, assemble, install and repair sheet metal products and equipment.

WAGES

Starting \$11.31/hr. \$23,500/yr.

Average \$17.74/hr. \$36,900 yr.

OPENINGS

950 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

Vocational training, OJT, or an AAS.

ESSENTIAL SKILLS

Technical Skills

Equipment Selection: determining the kind of tools and equipment needed to do a job.

Installation: installing equipment, machines, wiring or programs to meet specifications.

Quality Control Analysis: conducting tests and inspections of products, services, or processes to evaluate quality or performance.

Communication

Follows directions correctly: communicates effectively with customers and fellow employees.

Listens well and applies what is learned. **Reads** and applies safety warnings and simpler equipment instructions. **Writes sentences** with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds.

Professional ethics: Abides by workplace policies and laws and demonstrates personal integrity.

Personal hygiene and safety: Follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed, and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks.

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Applied Math (4), Reading for Information (3), Locating Information (4) and Observation (4)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Ball Corporation, Pepsi Bottling, Newport News Shipbuilding, Aerotek, Ameri-Force, MK Industries, ADVEX Corp.

CAREER PATHWAYS

Sheet metal workers learn their trade through both formal apprenticeships and informal on-the-job training programs. For some, this training begins in a high school where classes in English, algebra, geometry, physics, mechanical drawing and blueprint reading and general shop are recommended. After high school there are a number of different ways to train. Most sheet metal workers in large-scale manufacturing receive on-the-job training with additional class work or in-house training as necessary. Some employers may require specialized training or an associate degree for the most skilled assembly jobs. For example, jobs with electrical, electronic, and aircraft and motor vehicle products manufacturers typically require more formal education through technical schools. It is important for experienced sheet metal workers to keep abreast of new technological developments, such as the use of computerized layout and laser-cutting machines. Certifications in one of the specialties can be beneficial to workers and are offered by a wide variety of associations, several of which are listed in the sources of additional information at the end of this statement. Sheet metal workers in manufacturing may advance to positions as supervisors or quality inspectors.

Some of these workers may move into other management positions. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

COATING SPECIALISTS

JOB FUNCTIONS

Also known as service prep technicians. Set up, operate, or tend heating equipment, such as heat-treating furnaces, flame-hardening machines, induction machines, soaking pits, or vacuum equipment to temper, harden, anneal, or heat-treat metal or plastic objects.

WAGES

Starting \$14.97/hr. \$31,100/yr.

Average \$18.71/hr. \$38,900 yr.

OPENINGS

1300 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

High School or equivalent with vocational training, or OJT

ESSENTIAL SKILLS

Technical Skills

Judgment and Decision Making: considering the relative costs and benefits of potential actions, choose the most appropriate one.

Quality Control Analysis: conducting tests and inspections of products, services or processes to evaluate quality or performance.

Communication

Communicates effectively with customers and fellow employees.

Can present simple ideas and issues to an audience in an understandable manner. **Articulates problems** and participates in team discussions and debates. **Listens well** and applies what is learned. **Reads** and applies safety warnings and simpler equipment instructions. **Follows directions** correctly. Reads and uses manuals to solve problems. **Follows written reporting procedures** correctly with minimum errors of grammar, spelling and punctuation to write simple unformatted reports for internal-to-the-company consumption, and simple letters, summaries and reports for external-to-company consumption. **Translates situations** into verbal and written descriptions to clarify problems.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace.

Diversity awareness and application: communicates and works well with customers and coworkers of different ages, genders, races, socioeconomic, ethnicities and cultural backgrounds.

Professional ethics: abides by workplace policies and laws and demonstrates personal integrity.

Personal hygiene and safety: follows safety guidelines and manages personal health.

Technology Skills

Internet use and safety: uses the Internet appropriately for work-related projects.

Software applications: learns computer applications as needed to do job.

Professional Skills

Personal appearance: appears neat and clean and presents well as a job applicant or employee or candidate seeking promotion.

Time and resource management: punctual, timely with work deadlines, manages time and other resources well.

Lifelong learning: demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills.

Team player: demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively.

Positive work ethic: arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks.

Reasoning, problem solving: identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks.

Locating information: knows how to research, locate and ethically apply reliable information to solve problems.

Systems thinking: understands his or her role in fulfilling the mission of this workplace.

ACT WORKKEYS JOB PROFILE

Bronze level: Applied Math (3), Reading for Information (3), Observation (4) and Locating Information (3)

VIRGINIA PENINSULA TRAINING PROVIDERS

Newport News Shipbuilding Apprentice School

Thomas Nelson Community College (Available in 2012)

APPLICATION PROCESS

Employer website, Peninsula Worklink, Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Davis Boat, Newport News Shipbuilding

CAREER PATHWAYS

Painting and coating workers employed in the manufacturing sector are usually required to have a high school degree or equivalent. Training for beginning painting and coating machine setters, operators and tenders and for painting, coating and decorating workers, may last from a few days to a couple of months. Coating, painting and spraying machine setters, operators and tenders who modify the operation of computer-controlled equipment may require additional training in computer operations and minor programming. Transportation equipment painters typically learn their jobs through either apprenticeships as helpers or post-secondary education in painting. A solid math background, including courses in algebra, geometry, trigonometry and basic statistics, also is useful, along with experience working with computers. Job opportunities and advancement can be enhanced by becoming certified in a particular machine skill. There are many trade groups that offer certification for machine operators and setup workers, and certifications vary greatly depending upon the skill level involved. Certifications may allow operators and setters to switch jobs more easily because they can prove their skills to a potential employer. Advancement usually takes the form of higher pay and a wider range of responsibilities. With experience and expertise, workers can become trainees for more highly skilled positions; for instance, it is common for machine operators to move into setup or machinery maintenance positions. Setup workers may also move into maintenance, machinist, or tool and die maker roles. Skilled workers with good communication and analytical skills can move into supervisory positions. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

WELDERS

JOB FUNCTIONS

Use hand-welding or flame-cutting equipment to weld or join metal components or to fill holes, indentations or seams of fabricated metal products.

WAGES

Starting \$13.06/hr. \$30,400/yr.

Average \$21.55/hr. \$44,800 yr.

OPENINGS

1,700 positions opening on the Virginia Peninsula from 2012 to 2016

EDUCATION

High school diploma or equivalent plus vocational training, OJT or an AAS

CERTIFICATIONS

AWS/ASME

ESSENTIAL SKILLS

Technical Skills

Equipment Selection: determining the kind of tools and equipment needed to do a job. **Installation:** installing equipment, machines, wiring or programs to meet specifications.

Operation and Control: controlling operations of equipment or systems. **Operation Monitoring:** watching gauges, dials or other indicators to make sure a machine is working properly.

Quality Assurance: e.g., SPC, ISO, supplier certification

Quality Control Analysis: conducting tests and inspections of products, services or processes. **Troubleshooting:** determining causes of operating errors and deciding what to do about it.

Communication

Follows directions correctly. **Communicates** effectively with customers and fellow employees. **Listens well** and applies what is learned. **Reads and applies** safety warnings and simpler equipment instructions. **Writes sentences** with minor grammar and punctuation errors.

Workplace Skills

Creativity, innovation, adaptation: contributes new ideas and adapts to changes in the workplace. **Diversity awareness and application:** communicates and works well with customers and coworkers of different ages, genders, races, socioeconomics, ethnicities and cultural backgrounds. **Professional ethics:** abides by workplace policies and laws and demonstrates personal integrity. **Personal hygiene and safety:** follows safety guidelines and manages personal health.

Professional Skills

Time and resource management: punctual, timely with work deadlines, manages time and other resources well. **Lifelong learning:** demonstrates desire for continuous learning and interest in new procedures and technology and in improving skills. **Team player:** demonstrates commitment to the success of the team, assists others, requests help when needed and resolves conflicts effectively. **Positive work ethic:** arrives ready to work, is supportive of accomplishing tasks at hand, completes work assignments in effective and efficient way and is willing to take on additional tasks. **Reasoning, problem solving:** identifies, breaks down, prioritizes and resolves problems that arise in completing assigned tasks. **Systems thinking:** understands his or her role

in fulfilling the mission of this workplace. Evaluates quality or performance.

ACT WORKKEYS JOB PROFILE

Bronze level: Applied Math (3), Reading for Information (3), Locating Information (4) and Observation (4)

VIRGINIA PENINSULA TRAINING PROVIDERS

New Horizons Regional Education Centers
Newport News Shipbuilding Apprentice School
Thomas Nelson Community College (certificate)

APPLICATION PROCESS

Employer website, Peninsula Worklink,
Virginia Employment Commission

CURRENT EMPLOYERS OF RECORD

Davis Boat Works Inc., Liebherr Mining Equipment Co. (Liebherr-America, Inc.), Newport News Shipbuilding, Advex Corporation

CAREER PATHWAY

Training for welding, soldering and brazing workers can range from a few weeks of school or on-the-job training for low-skilled positions to several years of combined school and on-the-job training for highly skilled jobs. Formal training is available in high schools and postsecondary institutions, such as vocational-technical institutes, community colleges and private welding, soldering and brazing schools. Some employers are willing to hire inexperienced entry-level workers and train them on the job, but many prefer to hire workers who have been through formal training programs. Courses in blueprint reading, shop mathematics, mechanical drawing, physics, chemistry and metallurgy are helpful. An understanding of electricity also is very helpful, and knowledge of computers is gaining importance, especially for welding, soldering and brazing machine operators, who are becoming more responsible for programming robots and other computer-controlled machines. Because understanding the welding process and inspecting welds is important for both welders and welding machine operators, companies hiring machine operators prefer workers with a background in welding. Some welding positions require general certifications in welding or certifications in specific skills such as inspection or robotic welding. The American Welding Society certification courses are offered at many welding schools. Some employers have developed their own internal certification tests. Some employers are willing to pay training and testing costs for employees while others require workers to pay for classes and certification themselves. Welding, soldering and brazing workers need good eyesight, hand-eye coordination, and manual dexterity, along with good math, problem-solving and communication skills. They should be able to concentrate on detailed work for long periods and be able to bend, stoop and work in awkward positions. In addition, welders increasingly must be willing to receive training and perform tasks required in other production jobs. Welders can advance to more skilled welding jobs with additional training and experience. For example, they may become welding technicians, supervisors, inspectors or instructors. Some experienced welders open their own repair shops. Other welders, especially those who obtain a bachelor's degree or have many years of experience, may become welding engineers. Source: Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, 2010-11 Edition, Sept. 23, 2011 <http://www.bls.gov/oco/>

PARTNERSHIPS

The Peninsula Council for Workforce Development and Thomas Nelson Community College are leading a Career Pathways Planning initiative funded by The Ford Foundation and The Virginia Community Colleges. Partnerships have been forged with Peninsula manufacturers, public schools, colleges, universities and community partners to meet the demands of the 21st century workplace.

THE PARTNERS WITHIN THE REGIONAL EDUCATIONAL INSTITUTIONS INCLUDE:

Thomas Nelson Community College
New Horizons Regional Education Center
Public school systems of:

- Gloucester
- Hampton
- Newport News
- Williamsburg-James City County
- York County
- Poquoson

THE PARTNERS FROM THE ABE-GED PROGRAMS INCLUDE:

Adult Education from Hampton, Newport News, and Williamsburg-James City County Public Schools
Thomas Nelson Community College
Middle College Program

THE MANUFACTURING PARTNERS INCLUDE:

Alcoa-Howmet Power and Propulsion
Canon Virginia, Inc.
Liebherr-America, Inc.
Newport News Shipbuilding
and Others

THE PARTNERS FROM THE ECONOMIC AND WORKFORCE SECTOR INCLUDE:

Peninsula Council for Workforce Development
Hampton Roads Economic Development Alliance
The Greater Peninsula Workforce Investment Board
The Greater Peninsula Workforce Development Consortium
Peninsula Worklink One Stop System



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