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Office of Strategic Research

THE OHIO MACHINERY INDUSTRY



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THE OHIO MACHINERY INDUSTRY

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NAICS CODE DEFINITIONS AND EXAMPLES

- 333 Machinery Manufacturing. The products of manufacturers in this major industry apply mechanical force to perform work. Machinery products are distinguished from fabricated metal products (NAICS code 332) by the use of multiple metal forming techniques and the complexity of assembly in their creation. Design is important in machinery production, and is considered part of the production process for classification purposes.
- 3331 Agricultural, Construction & Mining Machinery.
- 33311 Agricultural Implements.
- 333111 Farm Machinery & Equipment. Examples include combines, cotton gins, feed processing equipment, planters, plows, farm tractors and attachments, milking machines and poultry brooders. Commercial mowing and other turf and grounds care equipment is also included.
- 333112 Lawn & Garden Equipment. Examples include powered lawn mowers, lawn and garden tractors, tillers, yard vacuums and blowers for the home. Non-powered lawn and garden equipment is classified in fabricated metal products (332).
- 33312 Construction Machinery. Examples include surface mining machinery, logging equipment, backhoes, bulldozers, cranes and tractors and attachments used for construction, off-highway trucks, pile drivers, powered post hole diggers, road graders, and portable crushing, pulverizing and screening equipment.
- 33313 Mining & Oil & Gas Field Machinery.
- 333131 Mining Machinery. Examples include products for underground use such as coal breakers and cutters, core and rock drills, mining cars and stationary rock crushers. Underground locomotives are classified as transportation equipment (336).
- 333132 Oil & Gas Field Machinery. Examples include derricks, drilling and production machinery. Water well drilling machinery is also included. Offshore and floating drilling platforms are classified as transportation equipment (336).
- 3332 Industrial Machinery.
- 33321 Sawmill & Woodworking Machinery. Examples include circular and band saws, planers and sanders. The distinguishing characteristic is that none of these is hand-held. Hand-held, non-powered equipment is classified in fabricated metals (332).
- 33322 Plastics & Rubber Industry Machinery. Examples include compression, extrusion and injection molding machines for plastics, and tire building and recapping machinery and equipment. Excluded are industrial metal molds for rubber and plastic products.
- 33329 Other Industrial Machinery.

- 333291 Paper Industry Machinery. Examples include pulp making machinery, and paper and paperboard making and converting machinery.
- 333292 Textile Machinery. Examples include drawing, extruding, finishing, knitting, spinning, texturizing and weaving machinery.
- 333293 Printing Machinery & Equipment. Examples include printing presses, typesetting and bindery machinery. Textile printing machinery is classified as textile machinery. Photographic and photocopying machinery and equipment are excluded.
- 333294 Food Products Machinery. Examples include homogenizers, pasteurizers, ice cream freezers, dough mixers, bakery ovens, pastry rolling machines, slicers, choppers, meat and poultry preparation and processing machines – all for commercial or industrial use. Commercial cooking and food warming equipment is excluded.
- 333295 Semiconductor Machinery. Also included are wafer processing and semi-conductor assembly and packaging. Printed circuit board machinery is excluded. Semiconductor testing instruments are classified as computer and electronic products (334).
- 333298 All Other Industrial Machinery. Examples include machinery and equipment for tanneries, petroleum refining, chemical processing, insulating wires and cables, and making cigarettes, circuit boards, glass, light bulbs and tubes, sewing machines and shoes (and their repair). Also included are cement, chemical and wood kilns.
- 3333 Commercial & Service Industry Machinery.
- 333311 Automatic Vending Machines. Examples include coin-operated mechanisms for vending machines, lockers, and laundry machines, and vending machines operated by tokens, paper currency, or magnetic cards. Arcade games are miscellaneous products (339).
- 333312 Commercial Laundry Equipment. Also included are dry-cleaning and pressing machines. Machines and equipment for household use are classified as appliances (335).
- 333313 Office Machinery. Examples include calculators, typewriters, dedicated word processing equipment and mail-handling machinery. Computers and peripheral equipment, facsimile machines, time clocks and associated stamps and automatic tellers are classified as computer and electronic products (334). Pencil sharpeners, staplers and staple removers, hand paper punches, cutters, trimmers, and other hand office equipment are classified as miscellaneous products (339).
- 333314 Optical Instruments & Lenses. Examples include binoculars, telescopes, microscopes, photographic lenses, prisms, and machinery and equipment for polishing, coating, and mounting lenses. Plastic lens blanks are considered plastic products (3261), and glass lens blanks are a non-metallic mineral product (327). Ophthalmic focus lenses are miscellaneous products (339). Electron and proton microscopes are classified as

- computer and electronic products (334).
- 333315 Photographic & Photocopying Equipment. Examples include microfilm equipment, photocopiers, and cameras using photographic film. However, the film, paper, cloth, plates and chemicals used in photography part of chemical manufacturing. Television, video, and digital cameras are part of computer and electronic products (334).
- 333319 Other Commercial & Service Machinery. Examples include carnival and amusement park rides, car-washing machinery, commercial coffee makers, commercial cooking equipment, industrial and commercial vacuum cleaners, carpet sweepers, motor vehicle alignment equipment, power washer cleaning equipment, and water treatment equipment.
- 3334 Ventilation, Heating, Air-conditioning (VHAC) & Commercial Refrigeration Equipment.
- 333411 Air Purification Equipment. Examples include stationary equipment for industrial dust and fume collection, electrostatic precipitation, air washers and warm air furnace filters. Portable air purification equipment is classified a household appliances (335).
- 333412 Industrial & Commercial Fans & Blowers. Examples include attic, ventilation and exhaust fans. Other than attics, household fans are considered household appliances (335).
- 333414 Heating Equipment. (Exc. Warm Air Furnaces). Examples include boilers, stoves, floor and wall furnaces, and wall and baseboard units. Electric space heaters and household stoves and ranges are classified as household appliances (335). Industrial, power and marine boilers are fabricated metal products (332). Commercial cooking equipment and industrial process furnaces and ovens classified elsewhere.
- 333415 AC, Warm Air Furnaces, & Refrigeration Equipment. Examples include AC units and their compressors and condensers, humidifiers and dehumidifiers, heat pumps, refrigerated counter and display cases, refrigerated drinking fountains, soda fountain cooling and dispensing equipment, and snow making machines. Motor vehicle AC systems and condensers are classified as transportation equipment (336). Household refrigerators and freezers are household appliances (335), as are portable humidifiers and dehumidifiers.
- 3335 Metalworking Machinery.
- 333511 Industrial Molds. All molds for casting materials such as plastics, glass, rubber and metals are classified herein, except for steel ingots.
- 333512 Machine Tools, Metal Cutting Type. Examples include grinders, lathes, and machines for boring, drilling, buffing, polishing and milling. Accessories and power-driven hand tools are classified elsewhere.
- 333513 Machine Tools, Metal Forming Type. Examples include punches and presses, and machines for sheering, bending, forming, forging and die-casting. Accessories, rolling mill machinery, and power-driven hand tools are classified elsewhere.

- 333514 Special Dies, Tools, Jigs & Fixtures. A jig is a guide or template for tools. The general difference between a die and a mold is that the former shapes solids and highly viscous material, while the latter shapes liquids that solidify.
- 333515 Machine Tool Accessories. Examples include knives and bits for lathes, drill bits, measuring attachments, tools to cut internal threads on pipes and nuts, etc. Saw blades and handsaws are classified as fabricated metal products (332).
- 333516 Rolling Mill Machinery. Rolling mills reduce or change the cross-sectional area of a metal slab by the compressive force of rotating rolls. The process is similar to squeezing clothes through the wringers of an old fashion washing machine.
- 333518 Other Metalworking Machinery. Examples include assembly machines, wire making machinery and equipment, and coil-winding and cutting machinery.
- 3336 Engine, Turbine & Transmission Equipment.
- 333611 Turbines & Turbine Generator Sets. Generators are classified as electrical equipment, and aircraft turbines are classified as transportation equipment (336).
- 333612 Speed Changers, Drives & Gears. Power transmission equipment for motor vehicles and aircraft is classified as transportation equipment (336). Hydrostatic drives are classified elsewhere.
- 333613 Mechanical Power Transmission Equipment. Examples include hydrostatic drives, plain bearings, couplings, joints and drive chains. Brakes and clutches, except for motor vehicles and electromagnetic industrial controls, are also included. Power transmission equipment for motor vehicles and aircraft is classified as transportation equipment (336).
- 333618 Other Engine Equipment. Establishments in this industry manufacture internal combustion engines, except those used for aircraft and gasoline powered automobiles. Diesel engines for motor vehicles are included.
- 3339 Other General Purpose Machinery.
- 33391 Pumps & Compressors.
- 333911 Pumps & Pumping Equipment. A variety of pumps are included: reciprocating, turbine, centrifugal, rotary, diaphragm. Pumps for domestic water systems, oil wells and oil fields, and sump pumps are also included. Pumps for motor vehicles – oil, water, power steering, etc. – are classified as transportation equipment (336). Measuring and dispensing pumps, vacuum pumps, and fluid power pumps and motors are classified elsewhere.
- 333912 Air & Gas Compressors. A variety of compressors are included: reciprocating, centrifugal, nonagricultural spraying and dusting, and spray gun units. Vacuum pumps are included, except those for laboratories. Laboratory pumps are classified in miscellaneous manufacturing (339). AC pumps and compressors are

classified elsewhere.

- 333913 Measuring & Dispensing Pumps. Examples include those for gasoline and lubricating oil.
- 33392 Material Handling Equipment.
- 333921 Elevators & Moving Stairways. Examples include garage and service station automobile lifts, dumbwaiters, escalators, moving walkways, and passenger and freight elevators.
- 333922 Conveyors & Conveying Equipment. Examples include a variety of types: belt, carousel, gravity, tow and trolley. Conveyors used on farms are included, as are pneumatic tubes.
- 333923 Hoists, Cranes & Monorails. Examples include aerial work platforms, tow truck hoists, block and tackle, metal pulleys (except for power transmission), and winches. Construction cranes, aircraft loading hoists, and power transmission pulleys are classified elsewhere.
- 333924 Industrial Trucks, Tractors, Trailers, Stackers. Examples include aircraft loading hoists, forklifts, pallet loaders and un-loaders, and portable loading docks. Construction and farm tractors are classified elsewhere. Motor vehicle trailers are classified as transportation equipment (336).
- 33399 All Other General Purpose Machinery.
- 333991 Power-Driven Hand Tools. Examples include drills, screw-guns, circular saws, chain saws, staplers, and nailers, whether electrically or pneumatically powered. Hand tools used only in construction such as tampers, jackhammers and augers, are classified elsewhere. Un-powered woodcutting tools are classified as fabricated metal products (332).
- 333992 Welding & Soldering Equipment. A variety of types are included: arc, gas, electron beam, laser, plasma, resistance and ultrasonic. The electrodes and wires for welding are also included, but handheld soldering equipment and transformers for arc welders are excluded.
- 333993 Packaging Machinery. Examples include machines for bottling, canning, labeling and wrapping.
- 333994 Industrial Furnaces & Ovens. Also included are induction and dielectric heating equipment and some kilns. Bakery and cremating ovens are classified elsewhere, as are cement, chemical and wood kilns.
- 333995 Fluid Power Cylinders & Actuators. The two types of fluid power are hydraulic and pneumatic.
- 333996 Fluid Power Pumps & Motors. The two types of fluid power are hydraulic and pneumatic.
- 333997 Scales & Balances (Exc. Laboratory). Laboratory scales and balances are classified as miscellaneous manufactures (339).
- 333999 Miscellaneous General Purpose Machinery. Examples include automatic fire sprinklers, baling machines, bridge and gate lifting machines, cremating ovens, hydraulic and pneumatic jacks, industrial centrifuges, and sieves and screening equipment.

NOTES

- 1 Power transmission in this industry excludes electricity and motor vehicle transmissions.
- 2 Notable is not used as an evaluative term. It refers only to company size in two ways: being named on either of Fortune's lists, or employing at least 500 people in Ohio. The 45 companies include some not listed in the text – specifically those having less than 50 employees at a site. The employment totals for the companies named also include those sites with less than 50 people whether or not the company is on either of Fortune's lists. General Motors is included because it has an interest in the DMAX facility, but Isuzu is the more active partner in operating DMAX. The Montgomery County facility makes diesel engines for motor vehicles. However, NAICS classifies all diesel engines as machinery because most are made for other uses. This also explains why DaimlerChrysler's Detroit Diesel Remanufacturing is on the list.
- 3 U.S. GSP is the sum of the GSPs for the 50 states and the District of Columbia. It is very close to, but not identical with, the GDP due to some minor technical differences. Figures in this section have not been adjusted for inflation.
- 4 Value-added (VA) and GSP data are closely related. In fact, compiling VA data is one step in the process of calculating GSP. VA figures, roughly the difference between the value of shipments and the costs of labor and material, are larger than GSP figures because additional costs have not been excluded from the former (e.g., the cost of services purchased by the manufacturing establishment). While VA and GSP are not identical, comparing portions of the national industry groups originating in Ohio is still instructive. If a state's proportion of U.S. industry group's VA is greater than the state's proportion of U.S. GSP, then the industry group is most likely concentrated in the state.
- 5 The 671 figure includes 471 in Siemens' joint ventures with Kohlberg, Kravis, Roberts & Co. In fact, Siemens' stake in the joint ventures is only 20 percent.
- 6 The switch from the Standard Industrial Classification (SIC) to the North American Industry Classification System (NAICS) beginning in 1997 created a discontinuity that prevents longer-term analysis.
- 7 Categories used in the graph and supporting table may not be based on NAICS. They were included only because they were close to NAICS industry group titles. Import and export data are available for earlier years, but the index value of the dollar shown in the graph and table dates to 1995 (Federal Reserve Board, 1999; U.S. Bureau of Economic Analysis, 2004).

- 8 The writers cite additional factors that they believe have given China the largest trade surplus with the U.S. of any single nation (see Crutsinger, 2005; U.S. Bureau of Economic Analysis, 2004: 88). These include the sheer size of the population, which provides a large home market allowing businesses economies of scale as well as the human resources for occupations requiring a variety of skills, and the country's openness to foreign investment, which permits companies to establish operations serving the Chinese market and producing goods for export to other countries. The writers also suggest possible remedies for the trade imbalance: allowing the yuan to strengthen, getting Americans to save more, reducing the budget deficit, aggressively enforcing trade laws, and doing a better job of defending intellectual property, and possibly reopening the deal allowing China into the World Trade Organization (WTO rules forbid currency manipulation). The writers do not believe correcting the trade imbalance will be easy. They also recognize that low cost imports, including machinery, are a boon to American customers (Business Week, 2004).
- 9 The general overview is based on McGraw-Hill (2000) and supplemented by analysts cited.
- 10 Farm subsidies, price supports, and set-asides are various financial arrangements intended to stabilize prices and, therefore, farm income. Stable farm income should lead to a stable demand for farm machinery and equipment. However, Fiore (2005) argues that they have the unintended effect of exacerbating supply-demand imbalances by encouraging farmers to plant more crops despite low prices, ultimately increasing the likelihood of low prices and weak long-term income growth. He also says that government regulations may have little impact on farmers. For example, farmers may pay for required less-polluting-but-more-expensive engines with government funds.
- 11 Maintenance and repair work helps smooth-out the ups and downs of cyclical industries.
- 12 It is ironic that various technical advances have not only made machinery longer lasting but, in conjunction with heightened competition, have made product life cycles shorter.
- 13 Hingher's (2005) concept of industrial machinery is broader than that conveyed by NAICS 3332. It includes pumps, valves and compressors for controlling the flow of gases and liquids. Flow control has lots of applications, including mechanical power transmission in machinery for construction, agriculture, metalworking, material handling and assembly. Pumps and valves also are part of VHAC and commercial refrigeration equipment. Flow control is also important for machinery not classified in 333 such as transportation equipment and home appliances.

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