



Top Shops

2016 Top Shops Benchmarking Survey & Honors Program

Benchmark Your Machining Business

Thank you for participating in *Modern Machine Shop's* sixth-annual Top Shops benchmarking survey, which highlights the attributes shared by leading U.S. and Canadian machining businesses. Please answer as many of the following survey questions as possible. Numeric answers must be entered as positive whole numbers. *All responses will remain confidential.*

Later in the year, a series of benchmarking reports of survey findings will be available. Provide your email address if you'd like to receive those reports. Additionally, if you'd like to enter the Top Shops Honors Program competition, please provide your email address as well as all the other contact information we request. Shops vetted and selected for the Honors Program will be profiled in an upcoming issue of *Modern Machine Shop* magazine. Do not provide contact information if you'd like to remain anonymous.

This 43-question survey must be completed by **February 29, 2016**. If you have questions, please contact Derek Korn, Senior Editor—*Modern Machine Shop*, at dkorn@mmsonline.com.

COMPANY INFORMATION

To receive the series of benchmarking reports of survey findings, provide your email address:

To enter the 2016 Top Shops Honors Program, also provide the following contact information:

Name: _____ Title: _____

Company: _____

Address: _____

City: _____ State: _____ ZIP: _____

Company telephone number: _____

Company website: _____

PROFILE QUESTIONS

1. What category best describes your business' relation to its customer base?

- Captive shop (component of a larger company)
- Contract shop (independent shop, mostly contracts for repeating part numbers)
- Job shop (independent shop, mostly short-run and other non-repeating jobs)

2. Approximately how many part numbers (SKUs) did your business produce in 2015? _____

3. Approximately how many total parts did your business produce in 2015? _____

4. Approximately what was the median batch size in 2015? _____

5. Which of the following industries does your business primarily serve?

- | | |
|--|---|
| <input type="checkbox"/> Aerospace | <input type="checkbox"/> Medical |
| <input type="checkbox"/> Appliances | <input type="checkbox"/> Military |
| <input type="checkbox"/> Automotive | <input type="checkbox"/> Off-road & construction machinery |
| <input type="checkbox"/> Die/mold | <input type="checkbox"/> Oil- & gas-field & mining machinery |
| <input type="checkbox"/> Electronics, computers & telecommunications | <input type="checkbox"/> Power generation (turbines, batteries, wiring, etc.) |
| <input type="checkbox"/> Forming & fabricating (non-automotive) | <input type="checkbox"/> Pumps, valves & plumbing products |
| <input type="checkbox"/> Furniture manufacturing | <input type="checkbox"/> Others (please list) _____ |
| <input type="checkbox"/> Industrial motors, hydraulics & mechanical components | _____ |
| <input type="checkbox"/> Machinery/equipment manufacturing | _____ |

MACHINING TECHNOLOGY

6. Which types of machining equipment does your business use?

- Broaching machines
- Drilling machines
- Flexible manufacturing systems (FMS)
- Gear-cutting machines
- Grinding machines (for regrinding cutting tools)
- Grinding machines (for workpieces)
- Honing machines
- Laser-cutting machines
- Lathes (non-CNC)
- Machining centers, horizontal
- Machining centers, vertical
- Milling machines (non-CNC)
- Plasma or oxy-fuel CNC cutting machines
- Sawing machines
- Swiss-type lathes
- Turning centers, horizontal CNC
- Turning centers, vertical CNC
- Turn-mill, multitasking machines
- Twin-spindle CNC turning machines
- Twin-turret CNC turning machines
- Waterjet machines
- Wire or sinker EDM

7. Which machining strategies does your business employ?

- Cutting to zero stock (moldmaking)
- Five-axis machining (full contouring)
- Five-axis machining (positioning only)
- Four-axis machining (full contouring)
- Four-axis machining (positioning only)
- Hard milling
- Hard turning
- High-speed machining
- Large-part machining
- Lights-out machining
- Micromachining
- Prototyping
- Others (please list) _____

8. Does your shop have 3D additive manufacturing/part printing capability (i.e. stereolithography, direct-metal laser sintering and related processes that build 3D parts layer by layer)?

- Yes, we have a 3D printer or additive manufacturing machine
- No, we do not have this capability

9. If you answered yes to question 8, describe your 3D printer. (If you have more than one, describe the level of your most advanced machine.)

- Desktop 3D printer for plastic parts
- Standalone and/or industrial 3D printer for plastic parts
- Standalone additive manufacturing machine for metal parts
- Hybrid machine tool combining additive manufacturing and machining

10. If you answered yes to question 8, describe what you use your 3D printing or additive manufacturing capability to produce (CHECK ALL THAT APPLY)

- Look-and-feel prototypes to validate designs
- Functional prototypes to test parts prior to production
- Tooling and fixturing used internally
- Tooling and fixturing produced for customers
- Short-run initial production
- Full production of end-use parts

11. Which tooling strategies does your business use?

- Carbide recycling program
- Coolant management system
- Custom/specialty tooling
- Minimum quantity lubrication
- On-machine probing for tool breakage/measurement
- Shopfloor tool vending systems
- Tool inventory management/usage tracking
- Tool presetting
- Tool regrinding
- None of these

12. Which workholding strategies does your business use?

- Hydraulic/pneumatic-actuated fixtures
- Indexers/rotary tables
- Magnetic chucks
- Multiple workpiece fixturing
- Pallet changers
- Quick-change devices
- Tombstones
- Vacuum chucks
- None of these

13. Which types of software does your business use?

- CAD systems—2D
- CAD systems—3D
- CAM programming software
- CMM programming software
- ERP/MRP software
- Job-estimating software
- PLM software
- SPC/quality management software
- Toolpath simulation/verification software
- None of these

14. Which types of inspection equipment does your business use?

- CMM in quality department
- Laser trackers
- Microscopes
- On-machine probes for workpiece measurement
- Optical comparators
- Portable measuring arms
- Shopfloor CMMs
- Vision systems
- None of these

15. Which types of ancillary equipment does your business use?

- Ballbar calibration
- Bar feeders
- Chip handling equipment
- Finishing equipment (i.e. anodizing, passivation, plating, etc.)
- Heat treating equipment
- High-pressure coolant delivery
- Machine condition monitoring (i.e. monitoring spindle, environmental conditions, etc.)
- Machine connectivity (Ethernet)
- Machine mist control units
- Marking/engraving equipment
- Robotic part loading/unloading
- None of these

16. What materials does your business machine?

Metallic

- Aluminum
- Brass
- Bronze
- Cast iron
- Compacted graphite iron
- Copper
- High-temperature alloys (not titanium)
- Mild steel
- Stainless steel
- Titanium
- Tool Steel
- Others (please list) _____

Non-Metallic

- Carbon-fiber-reinforced plastic (CFRP)
- Ceramic
- General plastics
- Medical-grade plastics
- Wood
- Others (please list) _____

17. How many CNC machine tools did your business have in production (non-tool room) in 2015? _____

18. What was your capacity utilization percentage in 2015? _____

19. What is the average age (in years) of the CNC machine tools currently in use on your shop floor? _____

SHOPFLOOR PRACTICES AND PERFORMANCE

20. Which of the following practices and improvement methodologies does your business use?

- 5S workplace organization
- Agile manufacturing
- Benchmarking
- Cellular manufacturing
- Continuous improvement program
- Just-in-time movement of material
- Kaizen events/blitzes
- Kanban and pull systems
- Overall Equipment Effectiveness (OEE) monitoring and analysis
- Poka yoke (error prevention)
- Quality certifications (i.e. ISO, NADCAP, etc.)
- Single-minute exchange of dies (SMED)
- Six sigma
- Theory of constraints
- Total productive maintenance
- Total quality management
- Value-stream mapping
- Others (please list) _____
- No formal methodology

21. Do you use robots to perform part loading/unloading for any of your machine tools?

- Yes
- No

22. Please provide the following measures for your business for 2015:

	2015
Order lead time <i>(receipt of order to delivery to customer in days)</i>	days
Machining time percentage <i>(% of order lead time that the product is being machined)</i>	%
Setup time <i>(measured in minutes, the time it takes to prepare a new job for machining, i.e. the time between the completion of the last good piece of the current run and the first good piece of the next run)</i>	Min.
On-time delivery rate <i>(% of goods delivered on time)</i>	%
Finished product first-pass quality yield <i>(% of product that passes final inspection)</i>	%
Scrap and rework percentage <i>(cost of scrap and rework as a % of shop sales)</i>	%
Scrap and rework percentage <i>(number of scrapped or reworked parts as a % of total parts produced)</i>	%
Machine usage <i>(average hours machines are in production per 24-hour day)</i>	Hrs.
Spindle utilization time <i>(amount of in-cut time as a % of machine uptime)</i>	%
Overall Equipment Effectiveness <i>(% machine availability × % quality yield × % of optimal rate that equipment operates)</i>	%

23. Installing a Web-enabled shop wide machine monitoring system has been suggested as the first and most important step toward data-driven manufacturing and Industrial Internet of Things/Industry 4.0 concepts. Please check the item that best describes your current plans regarding machine monitoring.

- We have a machine monitoring system in place for some or all machine tools. Describe the type of system you are using:
- _____
- _____
- _____
- We have plans to install a machine monitoring system. We expect installation to begin:
- First half of 2016
- Second half of 2016
- 2017 or later

24. Briefly explain how one new technology, machining strategy or strategic initiative has been most influential in contributing to the overall success of your business in recent years:

BUSINESS STRATEGY AND PERFORMANCE

25. Which of the following supply chain practices does your business use?

- | | |
|--|---|
| <input type="checkbox"/> Access to customer forecasts | <input type="checkbox"/> Just-in-time deliveries to customers |
| <input type="checkbox"/> Certification of major suppliers | <input type="checkbox"/> Sharing forecasts with suppliers |
| <input type="checkbox"/> Collaborative design with customers (DFM) | <input type="checkbox"/> Vendor-managed or -owned inventories |
| <input type="checkbox"/> Collaborative design with suppliers | <input type="checkbox"/> Vendor-managed or -owned inventories for customers |
| <input type="checkbox"/> Customer satisfaction surveys | <input type="checkbox"/> None of these |
| <input type="checkbox"/> Just-in-time deliveries from suppliers | |

26. Which of the following are effective sales/marketing tools for your business?

- | | |
|--|---|
| <input type="checkbox"/> Blogs | <input type="checkbox"/> Print advertising (i.e. magazines) |
| <input type="checkbox"/> Brochures/catalogs | <input type="checkbox"/> Sales personnel |
| <input type="checkbox"/> Customer tours of your shop | <input type="checkbox"/> Social media (Facebook, Twitter, LinkedIn) |
| <input type="checkbox"/> Email promotions | <input type="checkbox"/> Trade shows/events |
| <input type="checkbox"/> Online – advertising | <input type="checkbox"/> Trade associations |
| <input type="checkbox"/> Online – company website | <input type="checkbox"/> YouTube |
| | <input type="checkbox"/> None of these |

27. If your company is actively using social media, please select what channels you use:

- | | |
|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Facebook | <input type="checkbox"/> Instagram |
| <input type="checkbox"/> Twitter | <input type="checkbox"/> Reddit |
| <input type="checkbox"/> LinkedIn | |

28. For independent shops, how many active customers (paid for work) did your business have in 2015? _____

29. For independent shops, what percent of your customers account for 80% of your business' sales in 2015? _____

30. For independent shops, what was the customer retention rate for your business in 2015? (% of customers retained from the previous year) _____

31. What was your quote-to-book ratio? (business booked as a % of business quoted) _____

32. What were the following investments (in dollars) for your business in 2015?

Capital equipment (not tooling) _____

Tooling _____

Employee costs (all wages, benefits, etc.) _____

Materials and components _____

33. Do you lease or own your own your manufacturing facility?

Lease

Own

34. Please provide the following financial measures for your business in 2013. By calculating these measures, it will not be necessary to provide specific values for figures such as gross sales, net income, etc. This information will be kept confidential.

Gross sales/number of machines _____

Gross sales/number of employees _____

Profit margin: Net income/gross sales _____

Annual sales growth rate [(gross sales 2015 - gross sales 2014) /gross sales 2014] * 100 _____

Capital equipment expenditure/gross sales _____

35. What do you envision being your company's biggest challenge it will face in 2016?

HUMAN RESOURCES

36. How many total people did your business employ in 2015? _____

37. How many employees were directly involved in manufacturing at your business in 2015? _____

38. Which human resource practices/programs does your business use?

Annual review and raise program

Apprenticeship program

Bonus plan

Education reimbursements

Employee ownership options

Formal employee training program

Formal safety/health program

Leader/supervisor development

Paid medical benefits

Profit- or revenue-sharing plan

Teaming/team-building practices

Other (please list) _____

39. What was the approximate average wage rate for shopfloor personnel in 2015? (hourly rate without overtime)

Operators \$ _____ Setup personnel \$ _____ CAM programmers \$ _____

40. What was the annual labor turnover rate (percentage) for 2015? (number of voluntary and involuntary separations ÷ typical staffing level) _____

41. What is the average age of your shopfloor employees? _____

42. What is the average years of experience for your shopfloor employees? _____

43. On average, how many hours per year of formal training did each full-time employee receive in 2015?

- less than 8 hours
- 8-20 hours

- 21-40 hours
- more than 40 hours

Please return survey by **February 29, 2016** by faxing it to 513-527-8801 or mailing to:

TOP SHOPS

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