

“Many outstanding women leaders are making huge strides in building and promoting the manufacturing industry and are demonstrating what modern manufacturing offers – rewarding and fulfilling careers with limitless opportunity for growth. Today’s manufacturing employees are building and designing the future, and women in manufacturing serve as ambassadors to move this industry forward.”

Jay Timmons

President and CEO, National Association of Manufacturers

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The lay of the land: The state of women in manufacturing

Modern manufacturing is undergoing a fundamental transformation; a new fourth industrial revolution. Rapid technological advances and the convergence of physical and digital manufacturing are helping change the way manufacturers operate and raising the bar for required employee skillsets. Talent at all levels is becoming a key competitive differentiator. In fact, manufacturing executives around the world rank talent as the top driver of manufacturing competitiveness.¹ At the same time, the US manufacturing industry faces an estimated two-million-worker shortfall over the next decade, and industry executives report that six out of 10 positions are currently unfilled due to a manufacturing skills gap.² Yet, at least one critical element that can aid in closing the gap remains largely untapped—women.

About the women in manufacturing study

The Manufacturing Institute, APICS, and Deloitte surveyed over 600 women in manufacturing and conducted nearly 20 manufacturing executive interviews to explore how effectively manufacturing companies are attracting, recruiting, and retaining women, and what should be done to close the gender gap.

The women we surveyed are well-educated (88 percent hold a bachelor's degree or above), experienced (71 percent have been working over

15 years), hold a variety of senior positions, are employed by large companies (52 percent work in organizations with annual revenue over \$1 billion), and are evenly represented across generations.

Women represent a vast talent pool

Women constitute one of US manufacturing's largest pools of untapped talent. Women totaled about 47 percent of the US labor force in 2016, but only 29 percent of the manufacturing workforce.³ Women earn more than half of all associate's, bachelor's, and master's degrees.⁴ They are also advancing in their careers, holding more than half of all US managerial and professional positions.⁵ So with plenty of qualified women in the workforce, how can we increase the number in the manufacturing industry?

What do women have to say?

Given that women are underrepresented in manufacturing, and the argument to increase the industry's fair share of female talent is persuasive, one thing is certain: Manufacturing companies likely need a different approach to recruiting, retaining, and advancing women in the workplace. The women we surveyed and interviewed had a lot to say on the topic; not just about jobs they've had (or aspire to have), but about manufacturing and changes they would like to see in the industry's culture.

Bringing together executive and industry perspectives

In addition to surveying more than 600 women in manufacturing, The Manufacturing Institute and Deloitte interviewed a number of manufacturing industry leaders, including male and female executives, prior STEP (Science Technology, Engineering, and Production) Ahead honorees, and STEP Ahead emerging leaders to inform our overall insights. A special thank you to those who took part in the interviews:

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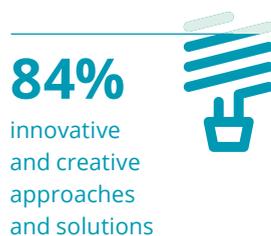
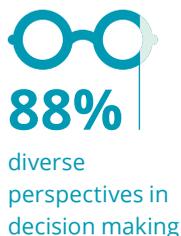
What's in it for manufacturers? Unleashing the potential of women can reap big rewards

Bottom-line boost

Research shows that gender diversity benefits a manufacturing firm through improved ability to innovate, higher return on equity (ROE), and increased profitability.⁶ When employees believe their organization is committed to inclusion, they report better business performance in terms of their ability to innovate.⁷ For example, companies in the MSCI World Index (a stock market index of 1,652 world stocks) with strong female leadership enjoyed both higher returns (average annual ROE of 10.1 percent versus 7.4 percent [as of September 9, 2015]) and superior average valuation (price to-book ratio of 1.76 versus 1.56) compared to companies without strong female leadership.⁸ Another analysis showed that an increase from no females in corporate leadership to 30 percent representation is associated with a 15 percent increase in net profitability.⁹

Diversity and innovation

According to survey respondents, having women on the leadership team can help manufacturers deliver:



“When women are among leaders in organizations, there is a wider lens of strategic thinking; groups/divisions can weather problems and issues better, and can identify innovative solutions faster.”

Executive interviewee



If you build it, she will come

Organizations can unleash the full potential of their female workforces by creating a culture where unique strengths thrive. Culture can't change without women in the room, so companies should incorporate strategies to attract high-performing women and develop solid retention strategies. Further, focusing on leadership development

can drive retention and foster diverse leadership perspectives. Understanding and addressing needs such as flexible workplace options also aid in recruitment and retention. If unique strengths aren't thriving, it is time to adapt and make changes to build a beacon that attracts the best and brightest.

What top executives say: Leadership perspectives

Women and men leaders in manufacturing who we interviewed were consistent in their views on important diversity topics facing manufacturing companies, employees, and the industry at large. Several common themes emerged and are outlined below.

1. Employee diversity makes good business sense.

- There is a direct correlation between diversity/inclusion and profitability, including the speed and type of innovation, and diversity of thought.
- Gender diverse leadership groups encourage broader strategic thinking, and together, these teams can tackle issues more effectively.

2. Companies should identify the gaps between expectations and workplace reality and set clear expectations.

- Identifying and recognizing the gap is a critical first step, but sending clear signals to the broader organization that the gap must be closed is vital.
- Perception of manufacturing continues to be outdated among women. A focus on improving perception is critical to attracting all talent, especially women.

- Work life balance is still one of the biggest challenges especially in production / assembly line manufacturing. Creative approaches, like providing schedules even a few weeks in advance, are needed.

3. Increasing visibility of women leaders is needed.

- Female role models need to be visible throughout all levels. It is easier to aspire to what you can see.
- Companies and professionals should build the future pipeline of talent by engaging with younger females. For example, female engineers sharing career stories with students is very impactful and sends a positive message about manufacturing. Companies may recruit hard and engage hard, but they also need to figure out how to drive women to the top.

4. Attract certified / degreed people early because once they come, they stay.

- Companies need to customize [retention] strategies for women (or men) with varying experience levels, using strategies like aligning recent female graduates with more experienced women in the organization.
- Benefits, flexibility, and culture are three factors that will attract experienced women.

5. Pay attention to the “group in the middle.”

- Consider how to retain and engage women at career points where work life balance becomes more complex. Take the opportunity to provide support, alternate pathways, and customization in times when women might need it most.
- It’s not just about maternity leave, for example, but companies should consider how to develop this group after their initial career success to challenge them and/or create opportunities when careers plateau.

6. The path forward.

- Recognize any efforts to address gender gaps need to begin with the dominant group; that is, men. Allies and advocates, at all levels and across genders, need to be identified and engaged.
- Identifying role models in the organization, mentorship and sponsorship programs, and more importantly believing in oneself / having confidence in one’s abilities, can help reduce the gender gap in manufacturing.

i Advice from female executives, to their younger selves

1. Be passionate about what you do and do what you love – and success will follow.
2. Take risks, have confidence, keep learning and growing.
3. Be bold, show trust in your abilities, and the willingness/drive to take the next step.
4. Do not be afraid to try new things, and get as many different experiences under your belt as you can.
5. Find the right mentors and sponsors within the organization, and develop good relationships. Strategic networking can contribute to recognition and success.
6. With grit, determination, and hard work, you can make your mark.
7. Don’t pull yourself out of the race prematurely. There are times where it looks like there are no easy answers, but you WILL figure it out.
8. When knocked down, have the courage, desire, and the will to get back up
9. When in a debate or providing opinion, be rational, analytical, and technical rather than being emotional.
10. It all begins and ends with you. You need to challenge the status quo and really drive it forward.

STEP Ahead honorees and emerging leaders are motivating women to choose careers in manufacturing



The Manufacturing Institute is promoting the role of women in manufacturing through the STEP Ahead initiative, which serves to mentor and recognize women while also leading research efforts tackling this important topic. The Manufacturing Institute has recognized 672 women with STEP / Emerging Leader awards over the five year period between 2013-2017.

How is STEP Ahead making a difference?

STEP Ahead Honoree and Emerging Leader award winners can assist manufacturers in motivating women to choose careers in manufacturing and in promoting their advancement.

Honorees and Emerging Leaders indicate STEP Ahead has helped raise the visibility of:

- Opportunities for women in the industry
- Manufacturing opportunities in the community
- Opportunities for women within their companies

Honorees say STEP Ahead recognition has helped their career.

- 42% of honorees aspire to reach the C-Suite
- 75% say STEP Ahead has increased visibility of opportunities for women
- 88% say it has increased their level of engagement in developing others

STEP Ahead Award winners are industry ambassadors.

- 88% engaged with individuals to raise the visibility of the industry
- 92% engaged in efforts in the development of women
- 70% engaged with K-12 system to encourage young girls and boys

Over the last 5 years, STEP Ahead Award winners have impacted more than 300,000 individuals – from peers in the industry to school age children.

“Sponsors can help mentor, but a really good one will challenge you to be uncomfortable in your world, put you in a place to think about how to stretch yourself, and make you think about things you wouldn’t have on your own.”

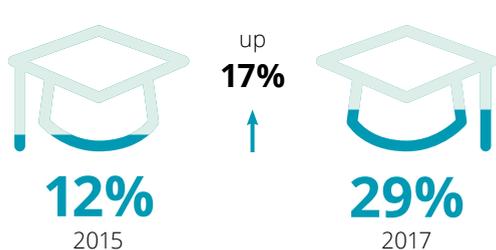
Executive interviewee



Recruiting and retaining female talent: The collective power of ambassadors

Opportunities to bolster manufacturing's attractiveness to women can begin at home and in schools, and female ambassadors can play an important role in improving perceptions. One executive interviewee pointed out, "If I can't encourage and influence my kids to go into manufacturing, then who else can?" Currently, according to the survey, very few women in manufacturing believe the school system actively encourages female students to pursue careers in their industry.

The good news? Many schools and the manufacturing industry have upped their game over the last two years, and women are noticing:



29 percent of women in 2017 (up from **12 percent** in 2015) think the school system actively / somewhat encourages female students to pursue a career in the manufacturing industry.



42 percent of women in 2017 (up from **24 percent** in 2015) would encourage their daughter or female family member to pursue a career in their industry.

i Women are noticing

58%

of women surveyed have noted positive change in their industry's attitude towards female professionals over the last five years

“Engage with people at a younger age. Female engineers going to a school and talking about manufacturing work is very impactful and sends a strong message about manufacturing.”

Executive interviewee



Keeping women on board: Retention drivers and perceived gaps

Opportunities for challenging assignments, work life balance, and attractive income are often the most important aspects of a women's career. Manufacturers seeking to retain talented women should consider aligning their employee policies to match these demands, while also recognizing female employees' generational differences. Survey respondents shared views on what makes them stay or go, as highlighted below.

What is most important to women in manufacturing?



Attractive pay



Challenging and interesting work



Work life balance

How can recognition programs make a difference?

STEP Ahead awardee respondents indicate the recognition / engagement has helped raise visibility of:



opportunities for women in the industry



manufacturing opportunities in the community



opportunities for women within their companies

What programs do women rank as most impactful?



Formal and informal mentorship programs



Flexible work practices



Increasing the visibility of key leaders who serve as role models

Would they do it all over again if they could start over?

Survey respondents were asked, "If you were to start your career today, would you choose to stay in your industry or prefer to start in a different industry?"



More than 70%
of women would stay in manufacturing if they were to start their career today

What is most important at a generational level?

Gen Y respondents place higher importance on work life balance and career progression while older generations prefer opportunities for challenging assignments and company culture. Attractive pay is a common thread across all.

Gen Y



Attractive income / pay



Work life balance



Career progression

Gen X



Challenging and interesting work



Attractive income / pay



Work life balance

Pre / boomers



Challenging and interesting work



Attractive income / pay



Company culture

Perceived gaps

Despite progress in certain areas, manufacturers have room for improvement in their efforts to attract, retain, and develop women.



Less than 15 percent of women surveyed believe their industry is very accepting of family / personal commitments and allows them to meet these commitments without impairing their career.



More than 4 out of 10 women surveyed are either responsible for the majority of household duties or share home responsibilities equally with their spouse or partner.



Nearly three quarters (72 percent) of women surveyed believe they are underrepresented in their organization's leadership team, with a significantly higher share of junior management (78 percent) believing they are underrepresented when compared to senior management.

Women say standards of performance are not equal



71%

surveyed believe standards of performance differ for men and women

Of those who believe standards differ, it is encouraging to note, however, that

42%

of those **believe the pay gap**

between men and women in the manufacturing industry has been

significantly/moderately shrinking over the last five years.

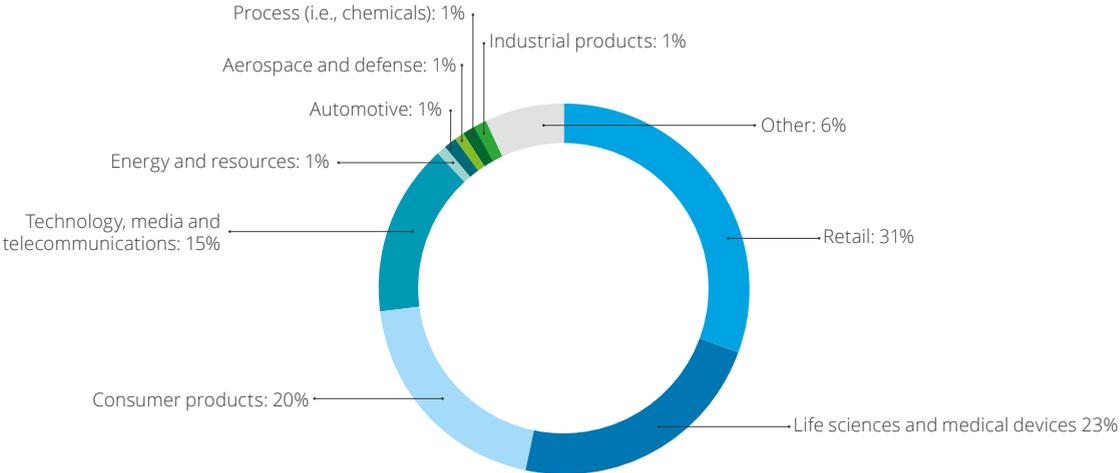
87%

of these believe the standards are higher for women

Secondary research corroborates the issue of less pay for women. In the United States, median earnings for women in 2015 were 79.9 percent of what men earned, when comparing for equal experience or roles. The pay gap persists even in STEM occupations such as computer, engineering, and scientific occupations, where women were paid an estimated 84.1 percent of men's annual median earnings in 2015.¹⁰

Other industries are better at attracting women

When asked which industries do the best job of attracting and retaining women, survey respondents cited retail, life sciences, consumer products, and technology. Much farther down the list? Manufacturing. In fact, **less than 10 percent of women surveyed chose traditional manufacturing industries** such as aerospace and defense, automotive, process, and industrial products **as best in attracting and retaining women.**



Formal networking groups still have room for improvement

60% 60 percent of women surveyed say there are women's network groups within their company and over half have high involvement

73% Yet, 73 percent believe these groups have been ineffective in advancing their careers

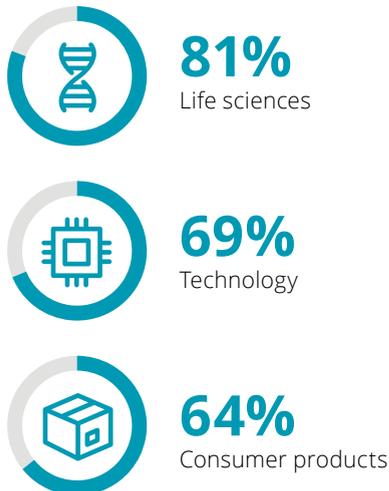
What makes them go?



If they were to move to another industry, where would they go?

For women who indicated they would move to a new industry if they were to start their career today, respondents ranked the following among their top five choices:

Highest choices



Lowest choices



Percentages indicate industries that ranked among respondents' top five choices.

“Companies should consider their maternity and paternity policies as a way to improve workplace flexibility – it doesn’t affect a huge number of people, but the message that it sends is so important.”

Executive interviewee



Forging ahead: The path to attracting, retaining, and advancing talented women

Formal and informal mentorships, flexible work practices, and improving the visibility of key leaders who serve as role models can be the most impactful programs that help manufacturers attract and retain women. And because these programs have enterprise-wide implications, both top-down and bottom-up support will likely be crucial to their effectiveness and sustainability. Among ways companies can forge ahead:

1. Start at the top and lead by example.

Currently, 72 percent of women surveyed believe they are underrepresented in their organization's leadership team. These respondents believe industry bias towards men for leadership positions, organizational cultural norms, and the perception of the industry overall are the three primary factors for underrepresentation of women. To move the needle on diversity & inclusion (D&I), senior leaders should be aligned on D&I as a business priority, set clear parity goals, and visibly lead by example. As one executive expressed, "The organization has to sense that leadership is really committed to the growth and inclusion of women in leadership ranks. If this is something that is going to grow and last, that starts with the CEO and board." There also must be a recognition that any efforts need to begin with the dominant group, and successful companies have created programs to engage both genders in promoting the importance of a diverse workforce.

2. Foster an innovative and inclusive culture that encourages gender-diverse teams at all levels.

Activate a culture that sparks diversity of thought and invites individuals to work together, spur innovation, and grow with purpose. Study participants cited a number of positive benefits of gender-diverse leadership teams and organizations, including diverse perspectives in decision-making, innovative and creative approaches and solutions, balanced organizational management, and improved financial performance. This is especially important at the time of hiring, because diverse teams cannot be built without a diverse candidate pool. Executives interviewed cited practices like requiring diverse hiring panels or holding hiring managers responsible as ways their companies have tackled the challenge of increasing diversity. Many executives echoed the benefits from having a large variety of inputs coming in, and increasing your team's "Possibility Portfolio" – the more diverse your team the more possibilities for different and unique ideas and opportunities.

3. Tackle workplace diversity issues head-on and create strong signals of change.

Unattractive pay, lack of opportunities for advancement/promotion, poor working relationships, work life balance issues, and lack of challenging assignments are the top issues that would cause women surveyed to leave the manufacturing industry. Company leaders should address these issues directly and create a work environment that meets the needs of all employees. It is important to identify allies, men and women alike, to reinforce that gender gaps are not acceptable. They should send clear signals, as well as set clear diversity goals, to all levels of the organization to drive compelling change. Does your organization have a 2020 goal for closing the gender parity gap and tackling diversity issues head-on?

4. Drive organizational accountability.

A common theme among executives interviewed is that they must take the lead in driving organizational accountability around increasing diversity and promoting a culture of inclusion. Strategies for tackling this challenge include not only setting clear goals, but also using analytics that assess and develop the organization's talent pipeline, including inclusion practices to maximize all employees' potential, fostering sponsorship of female employees, as well as promoting continual personal development and challenging assignments. Having a rich data set to monitor if the individuals who bring unique strengths are thriving, and if not, making changes will help drive richness and depth to an organization. One executive cited incorporating impact studies, not just for an annual report, but to address internally how their company can be more successful, and if they are not, discovering why not and what more they can do to drive change.

5. Promote professional development

With women ranking opportunities for challenging and interesting assignments as a top motivator for staying in the manufacturing industry— along with identifying and increasing the visibility of key leaders who serve as role models for

employees as a top three impactful retention strategy—it stands to reason investment in personal and professional career development can continue to build retention and advancement of women. Additionally, more experienced women can serve as sponsor advocates, undertaking sponsorees' development and professional progression, helping leave a legacy for both senior and developing women professionals.

6. Define an aspirational brand.

Leading companies know how to stand out when recruiting the best talent by creating an aspirational brand for potential and incumbent employees to stand behind and become beacons that attract. Companies can look to replicate these best practices by looking inside-out and outside-in to define an aspirational brand rooted in diversity and inclusion values, and touting inclusion consistently and widely. Engaging customers in the conversation can help to build a workforce that truly reflects customer insights and values. As one executive stated, "Manufacturing companies need to be willing to create a culture of being compared against the very best, not just in their sector. The best talent has a choice of industries to be in, and if a company's brand is not in line with areas they value, they'll make a change with their feet and leave that company and/or industry."

7. Partner with the community.

To address the manufacturing skills gap, employers must act early to build America's manufacturing workforce. A crucial element is educating the community about the opportunities and dispelling any negative preconceived notions. Successful companies address this by uniting with other employers facing similar challenges, then partnering local education and training providers with purpose, aligning values to partnerships and community action to maximize mutual benefit and support broader goals.

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1. "2016 Global Manufacturing Competitiveness Index," Deloitte and US Council on Competitiveness, 2016, <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Manufacturing/gx-global-mfg-competitiveness-index-2016.pdf>
2. "The skills gap in US manufacturing: 2015-2025 outlook," Deloitte and Manufacturing Institute, 2015, <https://www2.deloitte.com/us/en/pages/manufacturing/articles/skills-gap-manufacturing-survey-report.html>
3. "Employed persons by detailed industry, sex, race, and Hispanic or Latino ethnicity; Labor force statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/cpsaat18.htm>
4. "Degrees conferred by postsecondary institutions, by level of degree and sex of student: Selected years, 1869-70 through 2025-26," National Center for Education Statistics, https://nces.ed.gov/programs/digest/d15/tables/dt15_318.10.asp
5. "Employed persons by detailed occupation, sex, race, and Hispanic or Latino ethnicity; Labor force statistics from the Current Population Survey," US Bureau of Labor Statistics, <https://www.bls.gov/cps/cpsaat11.htm>
6. "Waiter, is that inclusion in my soup? A New Recipe to Improve Business Performance," Deloitte, 2013, <https://www2.deloitte.com/content/dam/Deloitte/au/Documents/human-capital/deloitte-au-hc-diversity-inclusion-soup-0513.pdf>; "The CS Gender 3000: Women in Senior Management," Credit Suisse, 2014, <https://publications.credit-suisse.com/tasks/render/file/index.cfm?fileid=8128F3C0-99BC-22E6-838E2A5B1E4366DF>; "Is Gender Diversity Profitable? Evidence from a Global Survey," Peterson Institute, 2016, <https://piie.com/system/files/documents/wp16-3.pdf>
7. "Waiter, is that inclusion in my soup? A New Recipe to Improve Business Performance," Deloitte, 2013, <https://www2.deloitte.com/content/dam/Deloitte/au/Documents/human-capital/deloitte-au-hc-diversity-inclusion-soup-0513.pdf>
8. "Women on boards: Global trends in gender diversity on corporate boards," MSCI, November 2015, <https://www.msci.com/documents/10199/04b6f646-d638-4878-9c61-4eb91748a82b>
9. "Is Gender Diversity Profitable? Evidence from a Global Survey," Peterson Institute, 2016, <https://piie.com/system/files/documents/wp16-3.pdf>
10. "Full-time, year-round workers and median earnings in the past 12 months by sex and detailed occupation: 2015, Industry and occupation," US Census Bureau, https://www.census.gov/people/io/publications/table_packages.html



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