

# Setting Standards for Manufacturing Excellence in India

India is keen to expand the role played by its manufacturing sector as it contributes more to national economic growth and benefits from shifts in global supply chains. However, to achieve such objectives, firms in India must set up high standards for manufacturing excellence, which in turn will attract greater investments and opportunities to participate in global value chains. Manufacturing standards are the foundation that enables industries to deliver high-quality products, optimize operational efficiency, enhance competitiveness, and meet global demands.

## Setting up manufacturing standards for your India business

Standards in manufacturing act as benchmarks for quality, safety, and efficiency. They ensure that products meet predefined criteria, creating trust and reliability in the marketplace.

For India, where manufacturing accounts for around 17 percent of the GDP and employs millions, adherence to global standards is crucial for long-term growth.

Key benefits include:

- **Global competitiveness:** Consistently meeting international standards improves India's competitive edge, helping manufacturers penetrate global markets.
- **Quality control:** Stringent standards lead to high-quality production processes, minimizing defects and reducing wastage.
- **Cost efficiency:** Standards streamline production processes, leading to cost reductions by minimizing operational errors and inefficiencies.
- **Innovation and R&D:** Adhering to standards encourages continuous improvement and innovation in manufacturing practices, facilitating research and development (R&D) activities.
- **Sustainability:** Manufacturing standards ensure the adoption of environmentally friendly practices, contributing to sustainability goals and regulatory compliance.

## Pillars of manufacturing excellence

Achieving manufacturing excellence requires an integrated approach that touches on various critical areas. These pillars ensure not only the success of individual enterprises but also contribute to the nation's overall manufacturing ecosystem.

### Product quality and safety

For Indian manufacturers to thrive in both domestic and global markets, maintaining stringent quality control processes is non-negotiable. Several organizations like the Bureau of Indian Standards (BIS) have been actively involved in setting national standards for product quality and safety. Adopting global standards, such as ISO certifications, provide an additional layer of credibility, allowing Indian products to be sold internationally.

- Quality Management Systems (ISO 9001)
- Safety Standards (ISO 45001)
- Environmental Management (ISO 14001)

These standards ensure that manufacturing processes are optimized for consistent quality output, safety, and minimal environmental impact.

### Automation and smart manufacturing

With Industry 4.0 transforming global production, Indian manufacturers must embrace automation, IoT (Internet of Things), and AI (Artificial Intelligence) to enhance productivity. Standards for automation and smart manufacturing ensure that industries adopt technologies that are interoperable, scalable, and secure.

- **Smart factories:** Integrating real-time data, IoT sensors, and AI-powered analytics helps manufacturers optimize production processes, foresee potential issues, and automate routine tasks.
- **Additive manufacturing:** 3D printing and other forms of additive manufacturing are setting new standards for product customization and rapid prototyping, improving the efficiency of Indian manufacturers.

The country's push for Digital India aligns well with these developments, encouraging industries to adopt advanced technologies that boost production efficiency and global competitiveness.

### Skilled workforce

A skilled workforce is a cornerstone of manufacturing excellence. Continuous education, retraining, and upskilling of workers are critical to meet the demands of an evolving industry landscape. India's large youth population presents a tremendous opportunity to create a globally competitive workforce through vocational training and industry collaboration.

## Key policy initiatives

- **Skill India:** A government initiative aimed at training over 40 crore people by 2022 in various industries, including manufacturing.
- **Apprenticeships and industry partnerships:** Collaboration between the government, private sector, and educational institutions to ensure that workers are trained in emerging technologies and manufacturing standards. Promoted in the 2023-24 Union Budget. Under this budget, INR 20 billion has been provided to the corporate affairs ministry for existing internships to youth across 500 companies and INR 100 billion has been provided to the labor ministry to enact other policies announced under the Employment Linked Incentive (ELI) scheme. A new central government sponsored skill scheme will be launched in collaboration with state governments and industry to train 2 million youth over 5 years. This includes upgrading 1,000 Industrial Training Institutes with industry-aligned course content – to make the workforce industry 4.0-ready.

### Sustainability and green manufacturing

The future of manufacturing in India must include sustainable practices that minimize environmental impact. Standards that promote energy efficiency, waste reduction, and recycling in production processes are essential. Green manufacturing focuses on reducing carbon emissions, water usage, and material waste while optimizing resource consumption.

Some critical standards in this area include:

- ISO 14001 (Environmental Management Systems)
- ISO 50001 (Energy Management)
- Eco-labeling and Life Cycle Assessment: These encourage companies to adopt cleaner technologies, improve their energy footprint, and create more sustainable products.

The Indian government has introduced several policies, such as the National Green Manufacturing Plan, which encourages industries to transition towards environmentally sustainable practices.

### Supply chain optimization

Efficient supply chains are critical to manufacturing excellence. By adopting supply chain standards, Indian manufacturers can reduce lead times, manage risks, and ensure the timely delivery of products. Ensuring transparency and traceability across the supply chain, from raw material sourcing to final delivery, is becoming an industry norm.

- **Just-in-Time (JIT) Inventory Management:** Reduces waste and optimizes resources.
- **Blockchain technology:** Offers transparency and traceability across the supply chain, preventing fraud, ensuring product authenticity, and managing logistics efficiently.

Supply chain optimization standards also encourage greater collaboration between manufacturers and suppliers, facilitating smoother operations across different production phases.

## Domestic policies and industry initiatives in India

Several government-led initiatives are aimed at enhancing manufacturing standards in India and boosting the industrial sector's global competitiveness.

- **Make in India:** Launched in 2014, this initiative promotes domestic manufacturing and aims to increase the share of manufacturing in GDP to 25 percent.
- **Production Linked Incentive (PLI) Scheme:** Under this scheme, incentives are provided to boost the production capacities of industries across sectors like electronics, automotive, textiles, and pharmaceuticals.
- **Atmanirbhar Bharat:** This vision emphasizes self-reliance by encouraging local production and innovation in key sectors like defense, electronics, and renewable energy.

Additionally, industry bodies like the Confederation of Indian Industry (CII) and the Federation of Indian Chambers of Commerce and Industry (FICCI) are playing a crucial role in advocating for higher standards, policy reforms, and skill development programs to ensure India's manufacturing sector remains competitive.

## The road ahead

Setting robust standards for manufacturing excellence in India is crucial to achieving sustained growth and competitiveness in the global arena. While the country has made considerable progress, the next phase of development requires a concerted effort from the central and state governments, industry, and academia to foster innovation, improve quality, and build a skilled workforce.

Adopting global best practices, investing in research and development, and ensuring regulatory compliance will set the foundation for a thriving manufacturing sector that meets international standards. India's journey toward manufacturing excellence is not only essential for economic growth but also for creating a sustainable, skilled, and resilient industrial ecosystem that can compete on the world stage.

With the right blend of policies, technology, and workforce capabilities, India is well-positioned to become a manufacturing powerhouse of the future.