

Manufacturing Metrics that Matter Most: A Comprehensive Checklist

Each year, the MESA organization ([Manufacturing Enterprise Solutions Association](#)) sponsors research to help the manufacturing marketplace identify the most important manufacturing metrics, and help decision makers understand metrics improvements and their relationships to metrics programs and the use of software solutions. As part of their most [recent metrics survey](#), the following manufacturing metrics were identified as being the most utilized by discrete, process, and hybrid/batch manufacturers.

Customer Experience & Responsiveness Manufacturing Metrics

- ***On-Time Delivery to Commit*** – The percentage of time that manufacturing delivers a completed product on the schedule that was committed to customers.
- ***Manufacturing Cycle Time*** – The speed or time it takes for manufacturing to produce a given product from the time the order is released to production, to finished goods.
- ***Time to Make Changeovers*** – The speed or time it takes to switch a manufacturing line or plant from making one product over to making a different product.

Quality Manufacturing Metrics

- ***Yield*** – The percentage of products that are manufactured correctly and to specifications the first time through the manufacturing process without scrap or rework.
- ***Customer Rejects/Return Material Authorizations>Returns*** – A measure of how many times customers reject products or request returns of products based on receipt of a bad or out of specification product.
- ***Supplier's Quality Incoming*** – The percentage of good quality materials coming into the manufacturing process from a given supplier.

Efficiency Manufacturing Metrics

- ***Throughput*** – Measures how much product is being produced on a machine, line, unit, or plant over a specified period.
- ***Capacity Utilization*** – Indicates how much of the total manufacturing output capacity is being utilized at a given point in time.
- ***Overall Equipment Effectiveness (OEE)*** – A multiplier of Availability X Performance X Quality that's used to indicate the overall effectiveness of a piece of production equipment, or an entire production line.
- ***Schedule or Production Attainment*** – A percentage of time a target level of production is attained within a specified schedule of time.

Inventory Metrics

- ***WIP Inventory/Turns*** – Measures the efficient use of inventory materials and is calculated by dividing the cost of goods sold by the average inventory used to produce those goods.

Compliance Metrics

- ***Reportable Health and Safety Incidents*** – The number of health and safety incidents that were either actual incidents or near misses that were recorded as occurring over a period.

- ***Reportable Environmental Incidents*** – The number of health and safety incidents that were recorded as occurring over a period.
- ***Number of Non-Compliance Events / Year*** – The number of times a plant or facility operated outside the guidelines of normal regulatory compliance rules over a one-year period.

Maintenance Manufacturing Metrics

- ***Percentage Planned vs. Emergency Maintenance Work Orders*** – How often scheduled maintenance takes place, versus more disruptive/un-planned maintenance.
- ***Downtime in Proportion to Operating Time*** – Ratio of downtime to operating time – a direct indicator of asset availability for production.

Flexibility & Innovation

- ***Rate of New Product Introduction*** – How rapidly new products can be introduced to the marketplace based on design, development and manufacturing ramp up times.
- ***Engineering Change Order Cycle Time*** – How rapidly design changes or modifications to existing products can be implemented all the way through documentation processes and volume production.

Costs & Profitability Manufacturing Metrics

- ***Total Manufacturing Cost per Unit Excluding Materials*** – A measure of all potentially controllable manufacturing costs that go into the production of a given manufactured unit, item or volume.
- ***Manufacturing Cost as a Percentage of Revenue*** – A ratio of total manufacturing costs to the overall revenues produced by a manufacturing plant or business unit.
- ***Net Operating Profit*** – The financial profitability for all investors/shareholders/debt holders, either before or after taxes, for a manufacturing plant or business unit.
- ***Productivity in Revenue per Employee*** – Amount of revenue generated by a plant, business unit or company, divided by the number of employees.
- ***Average Unit Contribution Margin*** – A ratio of the profit margin that is generated by a manufacturing plant or business unit, divided into a given unit or volume of production.
- ***Return on Assets/Return on Net Assets*** – A measure of financial performance calculated by dividing the net income from a manufacturing plant or business unit by the value of fixed assets and working capital deployed.
- ***Energy Cost per Unit*** – The cost of energy (electricity, steam, oil, gas, etc.) required to produce a specific unit or volume of production.
- ***Cash-to-Cash Cycle Time*** – The duration between the purchase of a manufacturing plant or business unit's inventory, and the collection of payments/accounts receivable for the sale of products that utilize that inventory – typically measured in days.
- ***EBITDA*** – A calculation of some business unit or company's earnings, prior to having any interest payments, tax, depreciation, and amortization subtracted for any final accounting of income and expenses. EBITDA is typically used as top-level indication of the current operational profitability of a business.
- ***Customer Fill Rate/On-Time delivery/Perfect Order Percentage*** – The percentage of times that customers receive the entirety of their ordered manufactured goods, to the correct specifications, and delivered at the expected time.

Manufacturing Metrics to Track for Logistics

- **Cost** – The ultimate metric for measuring cost performance is cost per pound. The metric is easy to create, completely transparent, and will give you great insights into your freight spending.
- **On Time Performance** – All LTL carriers provide an estimated transit time for shipments; however, those transit times are not guaranteed. Most carriers will have on time performance of 90% or better but understanding exactly how a carrier performs on your lanes will help your company make better choices.
- **Billing Accuracy** – Incorrect freight bills drive the accountants crazy! In addition to the hours of reconciling bad bills, the added cost has to be accounted for somehow. Sometimes it has to be passed on to clients, who were already billed for freight or the added cost has to be absorbed by the company.
- **Damage Free Shipments** – Cost, on time performance and billing accuracy don't mean much if the carrier damages the freight. **Freight damage** must be measured. Be sure to measure all damage not just freight claims filed. Damaged packaging, small scratches, and loose pieces are all upsetting to the receiver and the end customer, so they should be documented and measured, even if there isn't a freight claim filed.

What manufacturing metrics are important to track that is missing from this list?