

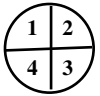
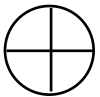
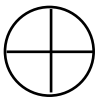
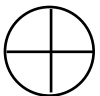

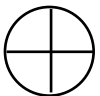
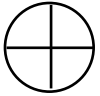
lean manufacturing

Building Blocks Assessment Guidelines

Name:
Plant:
Date:






Leadership

OBJECTIVE: Continually exceed customer requirements in the most efficient and cost effective manner.

Level	Measurable	% Evident
1.	A business plan is in place that defines long and short term goals that are in support of the company's vision and mission statements.	
2.	Competitive analysis of key measures and benchmarking of key processes and systems are foundations for the company's continuous improvement program.	
3.	Integrity in the company's dealings with employees, customers, and suppliers is never compromised.	
4.	Employee growth and involvement is part of the company culture, and continuous learning and improvement in the capability of people is promoted in every department and at all levels.	
5.	Employee satisfaction and commitment to company goals are fostered by building and supporting open communication, teamwork, and trust.	
6.	Continuous improvement in every aspect of the business is an integral part of the company's culture, and quality leadership is a priority.	
7.	There is a focus on simplifying or flattening the organizational structure and eliminating non-value added functions.	

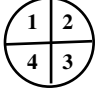
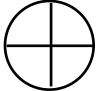
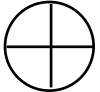
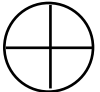
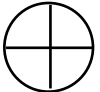
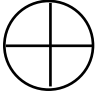
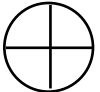
Total Quarters: _____

Key:

0:  0% – Not found anywhere	3:  75% – Very typical, some exceptions
1:  25% – Only seen in some areas	4:  100% – Everywhere in plant, no exceptions
2:  50% – Commonly found but not in the majority of cases	

Customer Satisfaction

OBJECTIVE: Achieve and maintain best in class performance in customer quality, delivery, and cost.








Level	Measurable	% Evident
1.	A customer focus has been established and sustained throughout the organization, and the company does not compromise its commitment to customer satisfaction.	
2.	A process for determining customer satisfaction is in place, and key performance metrics, trends, and targets are documented.	
3.	Continuous improvement measures of customer quality and delivery performance are tracked over time against improvement targets and competitors' performance.	
4.	A system is in place that focuses on the reduction of variation and waste resulting in measurable customer quality improvements and cost reductions.	
5.	An improvement program is in place that is reducing the time to market from product concept to full production, and measures are used to track progress against improvement targets.	
6.	Processes and products are designed with the intent of meeting the market's demand for mass customization.	
7.	It is understood that each customer expects world class quality, and that global competition continually raises the standard.	

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Employee Involvement

Objective: All employees seek opportunities for quality and productivity improvement, and make them happen together.

Level	Measurable	% Evident
1.	People are trained to master their assigned job, and certified in their ability to meet productivity and quality standards. The Certification Card is proudly displayed at the workstation.	
2.	Production personnel adhere to the defined process and methods, and understand changes require prescribed reviews and approvals.	
3.	Improvement in the capability of people is promoted, and progress is tracked and posted at each workstation.	
4.	Each worker has been trained in a problem solving methodology, and is involved in problem identification and resolution.	
5.	Quality and productivity objectives are communicated to all personnel, and progress against targets and trends are posted at each workstation or machine cell.	
6.	Each worker understands the concept of delivering excellent quality parts to internal (next operations) and external customers.	
7.	Employees have been trained in quality control tools and their use is demonstrated throughout the factory.	








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Continuous Improvement

Objective: Team based and data driven continuous improvement in every aspect of the company's business.









Level	Measurable	% Evident
1.	A strategy and process for continuous improvement in quality and productivity has been developed and communicated to all company personnel, suppliers, and customers.	
2.	The company wide continuous improvement plan is in effect, and improvements have been realized throughout the organization.	
3.	A formalized measurement system is in place that defines customer expectations, and improvement targets and progress.	
4.	A 7 Step problem solving methodology or equivalent is in place that drives root cause determination and prevention actions.	
5.	Continuous improvement ideas are actively solicited from all employees, and the impact of approved projects is tracked.	
6.	Employees are trained in continuous improvement methodology and techniques, and understand the concept of waste and how to identify activities that absorb resources but create no value.	
7.	Improvements have been made through major capital investments and/or product innovations.	

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Quality

Objective: Improving performance by quality improvement occurring at the source.


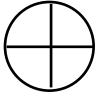
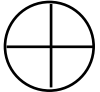
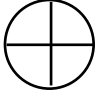
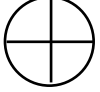
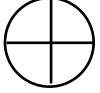
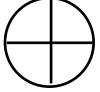
Level	Measurable	% Evident
1.	Each person in every department held responsible for his or her own quality. All personnel have been instructed in the basics of statistical process control, and understand the fundamentals of defect prevention.	
2.	Quality objectives, status, and trends are communicated to all personnel, and internal and customer data are posted in the factory. Customer quality improvement has the highest priority.	
3.	Regularly scheduled meetings are held with hourly and salaried personnel to review improvement progress on customer and internal quality measures, and continuous improvement actions.	
4.	Employees have access to information, resources, and support to meet or exceed customer quality, cost, and delivery expectations.	
5.	All employees participate in the elimination of waste such as inventory, scrap, rework, idle workers & equipment, inspection, and other operations that do not add value.	
6.	Teams have the authority to determine the root cause for problems, put in place corrective actions that permanently solve the problem, and make changes in the system that prevent the problem.	
7.	Employee understand a customer's operation should never be impacted by poor quality.	
8.	Rework areas have been eliminated.	

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Visual Control

Objective: Full employee awareness of requirements, and continuous improvement progress.

Level	Measurable	% Evident
1.	Pictorial and written operation instructions are posted at each workstation to communicate the work content and quality verification requirements of the job.	
2.	Product quality and productivity improvement data are posted and updated immediately so that factory and office employees get timely feedback on internal and customer measures.	
3.	Employee training plans and completion levels are posted at each machine cell, production line, or office.	
4.	The target and actual hourly output is displayed for each manufacturing group or line.	
5.	Flow diagrams define the sequence of operations required to produce highest quality parts at the least cost. These are posted at machine cells and production lines, and rigidly enforced.	
6.	Workmanship standards are posted at each work station, and a training program in these standards is in place.	
7.	Continuous improvement efforts are data driven, and contributions to quality improvement and problem resolution are recognized and posted throughout the company.	

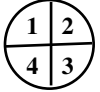
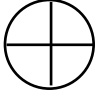
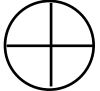
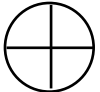
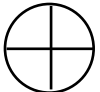

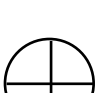

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Standard Processes

Objective: Adherence to a clearly defined process that yields maximum quality and output at least cost.

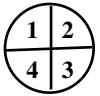
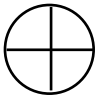
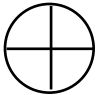
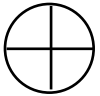
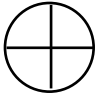
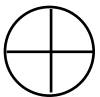
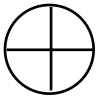
Level	Measurable	% Evident
1.	Process quality is defined as on target with least variation, and variation reduction is a primary objective.	
2.	Processes are clearly defined, and certified to yield maximum product quality and output.	
3.	Product and processes are designed so that employees can perform error free work.	
4.	The company is actively pursuing part standardization and rationalization.	
5.	Statistical process control is used to stabilize, reduce variation, and measure capability of each process.	
6.	Significant characteristics have been determined for each process through statistical analysis, DOE's, and/or experimentation.	
7.	Lessons learned related to things gone right and wrong with suppliers, manufacturing, and customers are fully documented.	
8.	A prescribed sequence of operations has been defined that focuses on quality, and changes to the sequence or operations require thorough analysis of impact on quality, output, and inventory levels and proper approvals.	

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Simultaneous Engineering

Objective: A team approach to product and process design so that employees can perform error free work.

Level	Measurable	% Evident
1.	Marketing, design engineering, and manufacturing partner with suppliers and the customer to design new products with a shared objective of highest quality at least cost.	
2.	The voice of the customer is fully integrated in new product designs, and the customer requirements allow optimization of the company and supplier's manufacturing capabilities.	
3.	Multifunctional teams, including manufacturing personnel, are included in the new product development process.	
4.	Tools such as Quality Function Deployment, Design of Experiments, Failure Mode Effects Analysis, and Design for Manufacturability and Assembly are used in the design process.	
5.	The Design for Manufacturability and Assembly Manual and Product and Process FMEA's are "living documents" that reflect lessons learned related to achieving perfect quality at least cost.	
6.	The product development cycle is continually improved, and the company leads the industry for new product time to market.	
7.	Suppliers are included in new product design at the earliest phase to reduce cost and changes, and maximize quality.	









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Poka Yoke

Objective: The prevention of defects by designing products and processes so that defects cannot be produced at an operation.

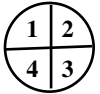
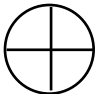


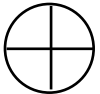
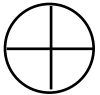
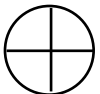
Level	Measurable	% Evident
1.	Parts are designed to be self-locating, eliminating the need for operator and assembler decisions during production.	
2.	Mistake proofing fixtures and devices are utilized where component designs do not yet allow self-locating.	
3.	Errors or mistakes are caught at an operation by using contact, fixed value, and/or motion step methods for verification, with instant feedback on quality.	
4.	Self-adjusting machines with automatic verification are used to prevent defects at the source.	
5.	Measurement systems are in place to monitor and control chart significant characteristics real time.	
6.	The machine or production line is automatically stopped when the operation goes outside control limits.	
7.	Each employee is empowered to stop an operation or line when the process goes out of control, a defective part is produced, or there is a doubt about a finished or supplier's part.	
8.	Trouble lights are used to signal a process or part issue.	
		Total Quarters: _____

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5S Process

Objective: Maintenance of a spotless work environment where everything has a place and is in its place

Level	Measurable	% Evident
1.	A housekeeping standard has been established for the office and factory, and employees are trained in the standard and 5S process.	
2.	A team of office and production personnel conducts weekly audits to identify improvement opportunities and compliance.	
3.	Employees drive the 5S process to reach all five levels. The 5S's defined are: <i>Seiri</i> (organization), <i>Seiton</i> (orderliness), <i>Seiso</i> (cleanliness), <i>Seiketsu</i> (standardized cleanup), <i>Shitsuke</i> (discipline).	
4.	Storage locations are clearly identified for all tools, fixtures, etc., and each item is labeled for ease in location.	
5.	Tools, fixtures, and parts are located for quick and easy access to the point of need, and personnel know their location.	
6.	All items not needed for production have been removed.	
7.	All caution signs, exits, fire extinguishers, and emergency procedures are clearly visible in the required posting areas.	









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Maintenance









Objective: Adherence to strict preventive maintenance schedules so that equipment downtime is a rare occurrence.

Level	Measurable	% Evident
1.	Preventive maintenance responsibilities are defined, and maintenance personnel are trained and certified in maintenance of specific equipment and in the basics of Total Productive Maintenance (TPM).	
2.	Sufficient trained personnel are available on all shifts to perform scheduled preventive and non-scheduled emergency maintenance.	
3.	Operators are certified in the performance of minor machine maintenance such as checking, oiling, and cleaning machines.	
4.	Preventive maintenance scheduling is computerized, including the issuance of work orders, and performance is tracked against schedule.	
5.	Predictive maintenance tools used to identify the need for preventive maintenance prior to failure.	
6.	Required preventive maintenance actions are clearly defined with estimated times for completion, and accurate maintenance histories are kept current and posted.	
7.	Machines that are guarded for safety are automatically locked out when they break down.	
8.	Available productive time on each machine, and action plans that address increases in uptime and improvement trends are posted.	
		Total Quarters: _____

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Cost Control

Objective: Team based and data driven continuous improvement in every aspect of the company's business.

Level	Measurable	% Evident
1.	Operation costs are defined, and each manager knows what it costs each day to operate his or her area.	
2.	Maintenance and service costs, and productivity are measured and progress against improvement targets are tracked.	
3.	All functions are involved in the business planning process.	
4.	Performance is measured by variance to budget.	
5.	There is an effective system for controlling variances, and identifying the Pareto of variances in each department/area.	
6.	There are improvement targets established for each variance category, and actions have been identified to reduce each variance type.	
7.	Cycle counts have eliminate the need for physical inventory counts.	
8.	There is an accurate frozen standard file.	








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Cellular Flow

Objective: Operations are arranged in a U - shaped cell, and a single unit of production is between each operation.

Level	Measurable	% Evident
1.	U shaped lines and machine cells are utilized, and equipment is positioned in a logical order.	
2.	Operations are linked with a maximum of one unit of production between each operation.	
3.	Material storage shelves have been removed so that problems are elevated and resolved instead of being hidden by inventories.	
4.	Operators perform multiple operations to maximize their productive time, and provide flexibility in work assignments to meet changes in demand.	
5.	Small, flexible machines are used within the manufacturing cell.	
6.	Work and storage areas and travel paths are well marked with colored lines. White lines designate aisles.	
7.	Material and product are stored in areas identified by colored lines, containers, totes, and/or carts. Green indicates good, yellow indicates on hold, and red indicates scrap or rejected parts.	

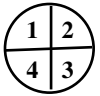
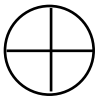
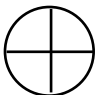
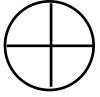



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Kanban

Objective: Elimination of inventory between operations, and a reduction in throughput time to minutes.

Level	Measurable	% Evident
1.	Plans for pull production are in process, and training for all personnel has been held.	
2.	Material movement is based on actual consumption; a pull signal is generated and communicated to the next operation.	
3.	Production is pulled through the factory, with processes withdrawing Kanban from upstream processes.	
4.	One unit at a time moves through an operation at a rate determined by customer demand.	
5.	Cycle or Tact times (the time required to produce one unit) have been determined, and the number of machine cell or production line operations have been balanced to meet customer demand.	
6.	Operations are balanced so that workloads are equal, and imbalance between operations is not tolerated.	
7.	Production begins only when prescribed parts are available for each operation. Running minus parts only adds cost and creates a risk of increased defects.	


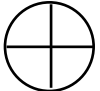




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Flexibility

Objective: People are trained to master multiple operations to meet fluctuations in demand.









Level	Measurable	% Evident
1.	Personnel are cross trained and certified in multiple operations so that they can operate multiple machines at a time and flexibility in work assignments is achieved.	
2.	Job rotation is used throughout the workday or week to ensure each worker maintains proficiency in each job within or across cells or lines.	
3.	Workers demonstrate the ability to respond to changes in job content, cycle time, and operation assignments so that variations in demand are met quickly and effectively.	
4.	An objective has been set to have each worker trained and certified in each operation within a production line or cell, and progress by employee is tracked and posted.	
5.	Processes are audited to ensure worker capability to meet quality and productivity requirements, process compliance, method sheet accuracy, and to identify potential improvements.	
6.	Each production line or cell team is accountable for identifying process improvements that will reduce cycle times and/or improve the quality of the part or assembly produced.	

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Quick Changeover

Objective: Reduction of set up time to minutes or zero by preplanning, and improving product and process designs.

Level	Measurable	% Evident
1.	Product designs and component specifications have been evaluated for increased standardization so that the need to changeover is reduced.	
2.	Detailed setup methods and procedures are documented, posted, and followed for operations that require setup.	
3.	Changeover teams operate like the Indianapolis 500 pit crew, and have been trained and certified in their ability to work as a team.	
4.	The changeover teams have video taped setup activities for detailed analysis, and reductions in changeover time have been achieved.	
5.	Availability of tools, components, visual aides required for changeover is preplanned and at the station when needed.	
6.	The need for adjustment is eliminated by having a system in place for advance setup and verification of any fixtures or programs.	
7.	External work is performed prior to the need to change over, and efforts have been made to convert internal to external work.	
8.	Parallel operations or equipment are being used until change overtime is reduced at the work station to the targeted level.	

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Production Planning

Objective: The synchronization of capacity and material with customer demand.

Level	Measurable	% Evident
1.	The sales and operations planning process is in place ensuring that all disciplines of the company are aligned around demand, inventory levels, and production rates for the next three to six months.	
2.	Schedules are leveled to match forecasted demand for a defined period such as a week or month, and models are sequenced for a smooth flow and to minimize inventories.	
3.	Demand by customer segment is well understood, and metrics exist to measure performance against customer requirements.	
4.	Forecasts are used to aggregate capacity and material planning and to set inventory levels for the pull system, but not to drive end item schedules.	
5.	A combination of the pull system and live customer orders manages the flow of material into and through the factory, not material requirements planning.	
6.	The master scheduler ensures the required amount of capacity is in place and the pull system is tuned to meet customer demand.	
7.	Suppliers are issued forecasts electronically (EDI or the Net) at least three to six months out to gain visibility of upcoming requirements.	
8.	High volume expensive component suppliers are sent schedules frequently and deliver frequently. Inexpensive component suppliers are sent schedules less frequently and deliver less frequently. Their schedules are either generated from the pull system or live customer orders.	



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Supplier Co-Destiny

Objective: Suppliers consistently achieve world class performance in quality, price, new product development, and delivery.

Level	Measurable	% Evident
1.	Supplier surveys have been conducted world wide to gain process knowledge, establish benchmark processes, compare component costs, and to reduce the number of suppliers to two per commodity.	
2.	Suppliers have a Certified quality system in place such as QS 9000 that requires verification by an independent auditor.	
3.	Supplier cost savings are segregated by process improvement, design change, material price reduction, vertical integration, currency fluctuation, site or supplier change, or negotiation skills.	
4.	Target costs for new products are established, and annual supplier improvement targets related to quality, price, product development, and delivery are tracked weekly or monthly.	
5.	Component and tooling costs are established, and competitive cost analysis is conducted in conjunction with process benchmarking to validate component and tooling prices.	
6.	Suppliers define, measure, and control key process variables, and that they continuously reduce variation in those variables.	
7.	Suppliers have a system in place that ensures on time delivery, and in exact quantities of material, and the system accommodates changes in customer in requirements.	

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