



SUPPLIER QUALITY REQUIREMENTS MANUAL

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CONTENTS

<u>SECTION</u>		<u>PAGE #</u>
	INTRODUCTION	3
01	SUPPLIER SELECTION AND APPROVAL PROCESS	
	1.1 SUPPLIER SELECTION AND APPROVAL	4
	1.2 SUPPLIER CLASSIFICATIONS	4
	1.3 SUPPLIER PARTNER PHILOSOPHY	4
02	SAMPLE SUBMISSION AND APPROVAL PROCESS	
	2.1 SAMPLE PART SUBMISSION AND APPROVAL	5
03	QUALITY PLANNING REQUIREMENTS	
	3.1 SAMPLE SUBMISSION	6
	3.2 WHEN A SAMPLE SUBMISSION IS REQUIRED	6
	3.3 SAMPLE SUBMISSION DOCUMENTATION	7
	3.4 LEGGETT & PLATT AEROSPACE MIDDLETOWN LEVELS OF CONTROL CHARACTERISTICS (Key Dimensions)	8
	3.5 PROCESS POTENTIAL STUDIES	9
	3.6 GAGE REPEATABILITY & REPRODUCIBILITY	10
04	FINAL INSPECTION AND RECORDS REQUIREMENTS	
	4.1 FINAL INSPECTION PLANS	11
	4.2 RECORDS OF FINAL INSPECTION RESULTS	12
05	SUPPLIER PERFORMANCE EVALUATION PROCESS	
	5.1 EVALUATION CRITERIA	13
	5.2 COSTS RELATED TO LOST PRODUCTION	13

INTRODUCTION

Procurement of quality goods and services is a key element vital to the success of Leggett & Platt Aerospace Middletown. For us to maintain the position of leadership we have in the marketplace, we will procure only from suppliers who demonstrate the ability to regularly provide quality consistent with Leggett & Platt Aerospace Middletown's expectations and specification requirements. It is our belief that our suppliers must be dedicated and committed to a quality philosophy of prevention and continuous improvement. Communication of requirements and understanding of expectations is the keystone of a successful customer/supplier relationship.

This manual has been constructed to convey Leggett & Platt Aerospace Middletown's quality requirements and expectations to our suppliers. Utilizing the fundamentals of an ISO 9001 / AS9100 Quality System Leggett & Platt Aerospace Middletown provides a foundation upon which the teamwork and trust needed to ensure continued success can be constructed. These objectives are supported by Leggett & Platt Aerospace Middletown's belief in the following principles:

- Leggett & Platt Aerospace Middletown believes that continual improvements of manufacturing and administrative processes and systems are daily activities. Being the best is the only option.
- That supplier must assume complete responsibility for the quality of their products and/or services.
- That each supplier must show evidence of a preventive quality system rather than continuing with an appraisal system.
- That the continuous improvement philosophy must be expanded into all areas of the supplier's operations and should include statistical controls as a tool used in the improvement process.
- That continuous improvement in quality and productivity can only be accomplished by including progressive employee training, employee involvement, and the application of applicable statistical problem-solving techniques and Lean activities within the scope of management tools.
- That in all cases of quality and productivity improvement, the true measure of success and effectiveness of a supplier's quality system will be the documented evidence. As identified, all requirements and expectations contained within this quality system standard shall be completely documented, controlled, and available for review by Leggett & Platt Aerospace Middletown representatives.
- That Leggett & Platt Aerospace Middletown can only assist a supplier in fulfilling its responsibility to quality by encouraging the development and implementation of systems designed to correct identified deficiencies and working with the supplier to identify and secure necessary resources.
- Leggett & Platt Aerospace Middletown serves as a conveyance for your parts and services to the end user. While the customer will initially see a Leggett & Platt Aerospace Middletown product,

the quality of each individual part must stand on its own. Suppliers' efforts will be rewarded by acceptance of **our** product by the consumer.

01 SUPPLIER SELECTION AND APPROVAL PROCESS

1.1 SUPPLIER SELECTION AND APPROVAL

Supplier evaluation and approval consists of completion of a supplier self-survey, an acceptable rating based on the responses provided and, in situations deemed appropriate by Leggett & Platt Aerospace Middletown, a site visit that may include evaluation of the potential supplier's quality system, including procurement, manufacturing process controls, inspections, and logistics processes capacity / capability.

All potential suppliers are subject to financial review using publicly available information such as Dunn & Bradstreet reporting, as well as private information provided by the supplier. Such information shall be held in strict confidence by Leggett & Platt Aerospace Middletown.

Final approval is also contingent upon the acceptance of sample parts / materials as described in sections 02 and 03 below.

1.2 SUPPLIER CLASSIFICATIONS

The supplier classification list below gives a brief description of the classifications assigned by Leggett & Platt Aerospace Middletown.

Unapproved. Unapproved Supplier (unacceptable survey results or performance) No purchases or receipts allowed. A potential supplier unable to attain an "Approved" or "Provisional score according to the Leggett & Platt Aerospace Middletown Supplier Evaluation Survey or an existing supplier that has been scored as "Unsatisfactory" according to Supplier Performance evaluation criteria and unsuccessful at implementing effective Corrective and Preventive Action(s).

Provisional. Provisional Supplier (Sub-par survey results or performance) as determined by supplier survey and/or site visit or subsequent poor quality or delivery performance. A provisional supplier unable to attain an "Approved" score according to the Leggett & Platt Aerospace Middletown Supplier Evaluation Survey or an existing supplier that has been scored as Provisional according to Leggett & Platt Aerospace Middletown supplier performance evaluations. Appropriate corrective and preventive actions must be initiated. Determination of the effectiveness of these actions is required to allow the supplier to move/return to "Approved" status.

Approved. Suppliers having attained an acceptable score according to the Leggett & Platt Aerospace Middletown Supplier Evaluation Survey and any site visits / audits and having been successful on the approval of submitted parts / materials. Maintaining this classification is dependant upon maintaining acceptable scores according to Leggett & Platt Aerospace Middletown's Supplier Performance evaluation criteria.

1.3 SUPPLIER PARTNER PHILOSOPHY

Leggett & Platt Aerospace Middletown Purchasing and other appropriate Leggett & Platt Aerospace Middletown personnel work with the supplier to maintain a mutually beneficial customer/supplier partnership. Following is Leggett & Platt Aerospace Middletown's supplier partnering philosophy:

- Encouragement of open communications and partner-like relationships between the supplier and Leggett & Platt Aerospace Middletown.
- Advising the supplier partner of the resources and support available either within or external to Leggett & Platt Aerospace Middletown to aid in quality planning, process control methods, gage development, and statistical methods for assessment, improvement, and control.
- Discussion of Leggett & Platt Aerospace Middletown's supplier partner expectations including expectations for continuous improvement and on-going cost reduction.
- Explanation of Leggett & Platt Aerospace Middletown's assembly processes and the function of the material/part used as it relates to the performance of the final product. This includes descriptions of the product into which the part is assembled, subsequent processing performed on the part, handling methods used within Leggett & Platt Aerospace Middletown, etc., where such information is not considered confidential or proprietary, as well as customer expectations of the final product.

02 SAMPLE PART SUBMISSION AND APPROVAL PROCESS

2.1 SAMPLE PART SUBMISSION AND APPROVAL

Sample part approval is contingent upon determination that the sample part(s) submitted meet specifications and also upon evaluation and acceptance of the supplier as defined in section 01 SUPPLIER SELECTION AND APPROVAL PROCESS above.

Part submissions shall be made in accordance with Leggett & Platt Aerospace Middletown Engineering / Quality representatives. Unless otherwise specified by Leggett & Platt Aerospace Middletown Engineering, a First Article Inspection is required per AS 9102 with a copy of the Engineering Technical plan with each new part to Leggett & Platt Aerospace Middletown.

Once all Sample submissions are complete, the file is submitted to the requester and presented to Leggett & Platt Aerospace Middletown Quality Assurance for evaluation. Final acceptance of the sample submission is evidenced by appropriate signature(s) on the AS9102 documentation. In the case of a rejection, the supplier will be notified by Leggett & Platt Aerospace Middletown Purchasing Representative of the deficiencies and arrangements will be made between Leggett & Platt Aerospace Middletown and the supplier for resubmission.

Among other requirements as defined in this manual, the supplier partner has prime responsibility for:

- Identifying and implementing any Corrective action required based on the results of any supplier assessment conducted by Leggett & Platt Aerospace Middletown or discrepancy with any sample part / material specifications.
- Developing a process flow diagram and description.
- Documenting Control Plans and identifying Key Product / Process Characteristics for product safety as applicable.
- Providing dimensions of sample parts including specified test requirements.
- Demonstrating process capability for control characteristics.
- Maintaining an effective gage calibration program that includes those supplied by Leggett & Platt Aerospace Middletown.
- Following the flow down of our customer's requirements and meeting their expectation where a specific Key Product or process characteristic is identified.
- Applying Production Part Approval (PPAP) when required.
- Have defined standard work for each operation.
- Notify Leggett & Platt Aerospace Middletown of any major change to production processes, location, or key personnel.
- Immediate notification to Leggett & Platt Aerospace Middletown of any delivered Non-conformance.
- Immediate notification to Leggett & Platt Aerospace Middletown of any delays to delivery schedule.

Note: Section 03 below provides basic descriptions and information of the major components of a submission

03 QUALITY PLANNING REQUIREMENTS

All suppliers seeking sample approval must submit samples in accordance with the instructions in this manual. If there are questions pertaining to these requirements, it is the supplier's responsibility to contact Leggett & Platt Aerospace Middletown Purchasing, or Leggett & Platt Aerospace Middletown Quality Assurance for guidance and assistance.

3.1 SAMPLE SUBMISSION

Samples submitted shall be taken from a significant production run. This production run shall be from one hour to eight hours of production utilizing only operations that will be a part of the production process, and with the specific production quantity to total a minimum of 100 consecutive parts. Normally, a 25-piece sample quantity is required. Where a production run is not possible, a minimum quantity will be defined.

3.2 WHEN A SAMPLE SUBMISSION IS REQUIRED

Sample Submission is always required **prior** to the first production shipment of product under the following situations:

- A new part or product.
- A twenty four month lapse in production of a previously approved part.
- Correction of a deficiency on a previously submitted part or product.
- Product modified according to an approved engineering change.
- Use of another optional construction or material than was used in a previously approved part.
- Production from new or modified tools (excluding perishable tools), e.g., dies, molds, patterns etc., including additional or replacement tooling.
- Production following refurbishment or rearrangement of existing tooling or equipment.
- Production following any change in process or method of manufacture.
- Production from tooling or equipment transferred to or from a different location.
- Change of source for subcontracted parts, materials, or services, e.g. heat-treating or plating.
- Production re-released after the tooling has been inactive for volume production for twenty four months or more.
- Following Leggett & Platt Aerospace Middletown's request to suspend shipment due to a supplier quality concern.

Leggett & Platt Aerospace Middletown and the supplier will agree upon an initial sample due date and quantity which will precede the first or subsequent production shipment.

Production shipments are not to be made until written approval is received from Leggett & Platt Aerospace Middletown in the form of a sign off on the AS9102 First Article Form.

3.3 SAMPLE SUBMISSION DOCUMENTATION

Leggett & Platt Aerospace Middletown Engineering / Quality representatives will communicate to the supplier the required documents from the following. The default will be a First Article Inspection per AS9102 and the traveler or technical plan of the process.

- AS9102 First Article Inspection Form.
- The indicated number of sample parts as required on the AS9102 Report.
- Any authorized engineering change documents not yet incorporated into the design record but incorporated into the part.
- Dimensional results referenced to the part drawing requirements or a checked print where the results are legibly written on a part drawing (including cross-sections, tracings, or sketches as applicable).
- Checking aids (fixtures, models, templates, mylars, etc.) specific to the part being submitted.
- Measurement system variation (Gage Repeatability and Reproducibility) studies for all equipment used for the statistical studies for new or modified gages, measurement and test equipment as requested by Leggett & Platt Aerospace Middletown Engineering /Quality Representatives.
- Material, performance, and durability test results as specified on the design record when applicable.
- Process flow diagrams. (Travelers or supplier equivalents can be utilized)
- Process Failure Mode and Effects Analysis (PFMEA).
When requested by Leggett & Platt Aerospace Middletown Engineering / Quality representatives.
- Control Plans that include all product and process-related Significant or Key characteristics. Control plans for “families” of similar parts are acceptable if the new parts have been reviewed for commonality. A traveler detailing the controls can be utilized.
- Process potential and/or capability results showing conformance to Leggett & Platt Aerospace Middletown requirements for Key, Significant, Safety, Critical, and Compliance-related characteristics, with supporting data such as control charts when requested by Leggett & Platt Aerospace Middletown Engineering / Quality Representative.
- Engineering approval when so required on Leggett & Platt Aerospace Middletown part drawings or specifications.

- Material certification as required on Leggett & Platt Aerospace Middletown part drawings, specifications, and/or other national or international specifications. The certification document must contain both quantitative and qualitative data. Blanket statements of compliance are not acceptable.

Note: If the supplier is unable to perform the testing required for the certification, another source must be provided to fulfill this requirement with appropriate credentials/certifications listed on the test results documentation.

3.4 LEGGETT & PLATT AEROSPACE MIDDLETOWN LEVELS OF CONTROL CHARACTERISTICS (Key Dimensions)

Part print dimensions designated with control characteristics or identified by Leggett & Platt Aerospace Middletown Engineering / Quality must be controlled statistically and included in the control plan or supplier traveler /technical plan. Methods of control should be appropriate to the characteristics being controlled and must be approved by Leggett & Platt Aerospace Middletown Engineering and / or Quality Assurance.

The use of dimensional / specification control characteristics is not intended to minimize the importance of other specifications or characteristics that must be controlled by the supplier partner. The supplier partner should develop a quality plan for all parts and part characteristics regardless of the category.

3.5 PROCESS POTENTIAL STUDIES

Process potential studies are short-term, preliminary evaluations of the process used to understand both the variability of the process and its potential for producing products that meet specification. A process potential study must be performed on all measurable control characteristics as defined by Leggett & Platt Aerospace Middletown Engineering before volume production to determine if the process is potentially capable of satisfying design intent and to establish a process. Variable data must be analyzed using control charts or similar methods.

Process potential studies are conducted in the following manner:

- The study will consist of a minimum of 25 sample subgroups of 5 pieces gathered without allowing adjustments to the process when possible. Where lot sizes is not conducive to subgroup, individual measurements may be utilized with a minimum of 25 pieces.
- The sampling will be repeated as described until the chart shows no points out of control and no evidence of trends.

Process potential is determined by calculating the standard deviation (σ) using the control chart data. The criteria for acceptable process potential are:

- An indication of stability as shown by preliminary control charting.
- 1.33 Cpk capability on Critical characteristics

- or -

1.33 Cpk capability on major characteristics as specified by Leggett & Platt Aerospace Middletown.

- Calculations are made as follows:

$$Cpk = \frac{USL - MEAN}{3\sigma} \quad \text{or} \quad \frac{MEAN - LSL}{3\sigma}$$

While the short duration of typical process potential studies makes this a very limited test for stability, any instability that does appear (e.g., a warm-up curve or shifts in values of characteristics) must be noted, understood, and reconciled to the satisfaction of all parties. Only if the performance of the process appears stable is the assessment of performance potential meaningful.

Such short-term studies will also not predict the effects of time and variation in people, materials, methods, equipment, measurement systems, and environment. Even for these short-term studies, it is important to collect and analyze the data in the order they are produced using control charts.

Once full production has begun, the supplier partner should continue process-monitoring activities to verify that required levels of Cpk are both attained and maintained. When a new product will be produced by an existing process that has demonstrated stability and capability, the process potential study may be waived and data of actual process control substituted.

This manual defines a recommended methodology for Leggett & Platt Aerospace Middletown suppliers. If the supplier utilizes different methods for process potential studies, they must be approved by Leggett & Platt Aerospace Middletown Quality Assurance

3.6 GAGE REPEATABILITY & REPRODUCIBILITY (GR&R)

Measurement repeatability is the variation in measurements obtained when one operator uses the same gage for measuring the identical characteristics of the same parts.

Measurement reproducibility is the variation in measurements made by different operators using the same gage when measuring identical characteristics of the same parts.

This instruction covers variable data gages used on dimensions of 0.010" or less. When tolerances are greater than 0.010", the effect of gage variation is minimal. Gage resolution should be 10% or less of the tolerance for the dimension checked (if plus or minus signs are used, indicate what direction the signs represent).

Methods for measuring Gage Repeatability & Reproducibility are according to the following:

1. Select at least two (2) operators who normally use the gage. A person familiar with the measurement being studied should be one of two observers.
2. Select five (5) clean parts that represent the normal range of the process and number the parts 1 to 5.
3. Set the gage using the master or appropriate standard.
4. Have operator number one measure the 5 parts in a random order and have another operator enter the results using the GR&R Data Sheet. Repeat this step until three measurements of each part have been made and recorded. (See the GR&R Data Sheet form in the **APPENDIX**).
Notes: The operator measuring should not record the results. If measurements can be taken at more than one location, such as an outside diameter, mark the point at which the measurement is taken to exclude any variation such as taper.
5. Repeat steps 3 and 4 with operator number two measuring the same 5 parts making sure that each operator is not influenced by the previous results.
6. Repeat the cycle with the parts measured in another random order and for the number of trials required.
7. Again, set the gage using the master or appropriate standard to see that the gage has maintained settings.
8. Using the GR&R form, enter the observations and calculate the gage R&R after reviewing the observed measurements for obvious errors.

The criteria for acceptance of measurement repeatability and reproducibility are:

20% and Under - Acceptable

Over 20% - Unacceptable

If over 20% review methods, take corrections and repeat study.

If study is still greater than 20% a change to the measurement system is required.

04 FINAL INSPECTION AND RECORDS REQUIREMENTS

4.1 FINAL INSPECTION PLANS

As an exhibition of confidence in Leggett & Platt Aerospace Middletown's supplier partners and to prevent redundancy of activities, Leggett & Platt Aerospace Middletown requires that supplier partners also submit for approval their documented plans/procedures for Final Inspection as requested by Leggett & Platt Aerospace Middletown. Inspection and testing per the approved methods must be performed for each shipment.

4.2 RECORDS OF FINAL INSPECTION RESULTS

Records of Final Inspection shall also be retained by the supplier partner and made available to Leggett & Platt Aerospace Middletown upon request (Normal record retention is 10yrs).

This includes all certifications. For any flight safety call out the retention is life.

Excluding certifications and First Article Inspections (FAIR) it is not required that these records be submitted with each shipment. However, they must be available to Leggett & Platt Aerospace Middletown immediately upon request.

- If required in product specification, product must be date coded with the date of manufacture (DOM).
- All cartons must be marked with the following information:
 - Part Number
 - Quantity of Parts in Carton / Container
 - “QA Accepted” designation in green ink or label for each container as an indication of inspection and test status.
- Markings must be applied to at least two adjacent sides of the carton or container for ease of identification during storage.

05 SUPPLIER PERFORMANCE EVALUATION

5.1 EVALUATION CRITERIA

All supplier partners’ performance will be evaluated on Quality and Delivery, excepting those parts / materials provided under agreements of Consignment or Consumption. Measurements are based on last six months of data.

5.2 COSTS RELATED TO LOST PRODUCTION

Delivery of materials/parts must be in accordance with the Terms and Conditions as stated on the Purchase Order. Any issues affecting delivery as scheduled must be brought to the attention of the appropriate Leggett & Platt Aerospace Middletown Buyer immediately.

If materials/parts are not received according to schedule or are not of the specified quality and quantity, the Supplier Partner will be held responsible for all costs incurred as a result. This includes costs associated with but not limited to: halting production; unplanned model changes; unavoidable rework costs; extra labor; finished goods rework; product recall/liability.

If incorrect or non-conforming product is received, the Supplier Partner has the right to correct the situation by one or more options. However, Leggett & Platt Aerospace Middletown is committed to meeting our customers shipping requirements and this may severely limit your choice of options. These include:

- sending replacement materials/parts
- providing manpower to repair/rework the materials/parts on-site
- sending materials/parts to an independent contractor for rework
- compensating Leggett & Platt Aerospace Middletown or a Leggett & Platt Aerospace Middletown subcontractor for rework costs, provided manpower is available.

In return, we invite you to visit our facilities to observe our processes and will be happy to arrange for you to speak directly with those employees using your product. Your input and suggestions of opportunities for improvement are welcomed.

We look forward to the opportunity to work with your company in the development of a rewarding partnership. Should there be any questions or concerns, please do not hesitate to contact Leggett & Platt Aerospace Middletown Purchasing representative.