



Tooling Dynamics, LLC Supplier Quality Requirements Manual

Supplier Quality Requirements Manual	Last Revision Date	Revision Number 0
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It is the policy of Tooling Dynamics, LLC to provide product and Customer service that meets or exceeds Customer's expectations. We are committed to continual improvement by adhering to a Quality Management System that defines requirements for meeting our business needs and the tools to establish, measure, and review quality objectives.

1. Purpose

The purpose of this document is to define and communicate Tooling Dynamics's minimum requirements and expectation to its supply base.

2. Scope

The Tooling Dynamics Quality Manual applies to all Tooling Dynamics's raw material, outside services, and production suppliers defined throughout this document at "Supplier".

3. General

Tooling Dynamics's supply base is a key element for Tooling Dynamics's ability to achieve and maintain a high standard of performance within the market place. Tooling Dynamics considers Supplier as an important part of the Tooling Dynamics team. An important building block for a successful Supplier-Customer partnership is communication. The guidelines contained within this document are written with the intent of communicating the requirements of Tooling Dynamics.

4. Quality Management System Requirements

Tooling Dynamics requires Supplier to have a Quality Management System which, at a minimum, is ISO 9001 3rd party certified. It is preferred that Suppliers be IATF 16949 3rd party certified. If a Supplier does not have ISO 9001 3rd party certification an onsite audit may be performed by Tooling Dynamics Quality Personnel to be considered for approval.

Tooling Dynamics expects that Supplier will focus on:

- Process improvement methodologies to continuously improve the effectiveness of their management system and manufacturing process.
- Delivery of error free products (zero defect target) and 100% on time delivery.
 - Supplier is fully responsible for quality of their supplied products and the consequences due to lack of meeting quality expectations as defined by purchase orders, specifications, prints, standard, etc.
 - Consequential damages and costs incurred by Tooling Dynamics or their customers related to Supplier defect may be charged back based on business impact

5. Delivery

Tooling Dynamics requires the Supplier deliver error free product or material, 100% of the time. It is the responsibility of the Supplier to ensure that deliveries are on-time despite shutdowns, vacations, etc. On time is defined as not more than (5) days early, (0) days late. The expected delivery rating and quality rating are 100%.

The Supplier shall email copy of packing slip, Certificate of Conformance, certifications and actual readings in PDF format to receiving@toolingdynamics.com on the day of shipment, assuring all documentation is available at time of receipt and reducing the amount of paperwork being handled at Incoming Inspection.

6. Supplier Performance Review

Suppliers are to notify Tooling Dynamics Customer Service Rep immediately of any potential issues that might interfere with meeting delivery schedules.

Supplier Scorecards will be sent quarterly to Tooling Dynamics's key suppliers.

- For any late delivery Tooling Dynamics quality will issue a Corrective Action Request to the supplier.

- Corrective Action Requests are expected to be returned within the time frame specified on each CPAR.

7. Premium Freight

Supplier is responsible for premium freight charges incurred when delivery schedules are not met.

8. Nonconforming Material

Supplier shall have necessary inspections in place to ensure that 100% conforming product is shipped.

- Nonconforming product found at Tooling Dynamics will be rejected and quarantined. A Rejected Material Report will be issued and sent to the Supplier with samples of problem (when applicable).
- Supplier is expected to evaluate the nonconformance and supply return authorization number to Purchasing.
- In the event Tooling Dynamics needs to sort or rework product due to delivery schedule, Supplier will be notified of the cost to do so prior to rework then billed for the costs.
- Supplier is required to notify Tooling Dynamics's buyer if any suspect/nonconforming material is received by Tooling Dynamics.

9. Calibration of Measurement Equipment

Supplier ensures that measuring and appropriate processing equipment is calibrated against standards traceable to international measurement standards. All calibrated equipment is to be uniquely identified and easy traceable to the calibration records.

10. Record Retention

Supplier is required to have an established system to control and maintain records. Examples include but are not limited to records inspection results, internal corrective actions, material certifications, process control charts, SPC charts. Records shall be available for review by Tooling Dynamics and regulatory authorities upon request.

11. Identification and Traceability

Supplier is required to maintain a lot traceability system that identifies the status and lot throughout all production stages, also applying to any-outsourced operations.

12. Sub-suppliers

Each Supplier is fully responsible for the control and continuous improvement efforts of sub-suppliers. Supplier should require their sub-suppliers to conform to the requirements specified herein. Tooling Dynamics reserves the right to verify and approve purchased products at the Supplier and sub-supplier's premises to ensure that contracted products conform to specified requirements.

13. Raw Material

Raw material shall be traceability to the mill number and master coil number, appearing on all paperwork for the purpose of traceability. Additionally, plated raw material shall have traceability to plating plated and thicknesses and composition (when appropriate). All material must follow the following shipping requirements shall be provided with each shipment.

- A Certificate of Analysis is required for chemical and physical properties of the base material.
- For plated raw material actual plating thickness and composition.
- A packing slip specifying the weight.
- Only quantities $\pm 10\%$ of actual amount ordered are acceptable.
- All coils or spools must be protected to prevent damage during shipment. Metal strapping cannot come in contact with edges of coiled material at anytime.

- Skid weight for pancake coils shall not be more than 1,000 pounds. Skid weight for traverse spools shall not be more than 2,000 pounds. Skids shall not be larger than 32" X 32" with a 21" clearance minimum between the end runners.
- Spacers shall be placed between the coils.
- Material width less than 2.0" shall have a .50" minimum – 1.0" maximum spacer between each coil to allow for handling.
- Material width 2.0" and over shall have a 1.0" minimum – 2.0" maximum spacer between each coil to allow for handling.
- A 6" sample of each pancake coil or traverse spool of material shall accompany each shipment; each sample must be labeled with coil number. These samples should be placed in an envelope and adhered to the shipment.

14. Post plated product

Supplier shall follow the below specifications when handling post-plated product

- Supplier shall maintain a correlation between all reels of plated product and their corresponding inspection reports.
- Supplier shall maintain a correlation between their identification numbers and Tooling Dynamics's identification numbers.
- Tooling Dynamics's incoming part number represents unplated product. After plating, the part number shall be changed to part number on the purchase order.
- The label with Tooling Dynamics's plated part number and other identification requirements must be placed so as to cover the original label with Tooling Dynamics's unplated part number.
- If Supplier is the cause of a partial reel (i.e. parts lost in plating), the quantity on the reel and packing slip should reflect actual counts.
- Supplier shall provide a certification of compliance for test results to Mil-Std specifications, Tooling Dynamics's purchase order and this specification.
- Supplier shall provide actual plating thickness results, solder plating composition results, solderability and adhesion testing with each shipment.
- Supplier shall provide a 6" sample for each plated reel. Each sample shall be individually bagged and identified, placed in an envelope and adhered to the shipment.
- The reels shall be packaged inside a container with sufficient support to deter movement during shipping.
- If reels are shipped to Supplier on skids, the skids must be used when returning the finished product.
- Where applicable, the reels shall be stacked with clip heads up. The front of the reel will be classified as the side with the head of the part and the back of the reel as the carrier side. The carrier should always be placed down in the shipping container.
- Wooden crates and masonite reels shall be supplied when required. Crates and Masonite reels are reusable.
- Winding direction and final pay-off to be specified on Tooling Dynamics's reeling drawing.
- Tooling Dynamics will supply the reeling drawing and part drawing at time of quote and any revisions thereafter.
- The leadframe shall be reeled so that the product is not bent or damaged causing any deformities, dimensional problems, parts being bent off of 90 degrees from carrier, excessive coil set, or camber.
- The leadframe shall be reeled with all heads covered by the paper interleaf and wound sufficiently tight so when turned on reel edge there is no movement in the windings. Windings cannot be excessively tight causing smashed or deformed parts.
- No splices are allowed on the finished product.
- A maximum of two breaks per reel are allowed. Whenever possible, Tooling Dynamics will provide the supplier with reels that have no more than one break.

- At least one foot of filament tape containing no sulfur or chlorine shall be placed on the reels to secure the end of paper. The tape shall be placed on the paper and not the reel flanges.
- At no time shall the strip be taped to the hub at the start of the reel. Do not tape the strip to the paper at a break.
- The reels of leadframe shall be laid flat with carrier side down throughout all operations to keep winding from loosening.
- The reels of leadframe shall not be stood on edge for storage or propped against equipment at any time.
- Tooling Dynamics shall supply all interleaf paper per product release. No other interleaf paper shall be used without prior approval.
- Supplier and sub-suppliers shall not make any unauthorized changes to a product, material or processes, that has been previously approved by Tooling Dynamics. Unauthorized changes include:
 - Manufacturing location
 - Process change
 - Chemicals
 - Base chemical type
 - Additives
 - Sub - Supplier
 - Operation Parameters
 - Chemical ratios
 - Line speed after four consecutive runs
 - Current density after four consecutive runs
 - Anode, cathode ratios
 - Plating line
 - Process and maintenance records must be maintained and be available for inspection by Tooling Dynamics. These records should include in addition to items specified in the Plating Process Changes above the following:
 - Organic and metallic contamination
 - Any routine maintenance during the processing of the plating lot
 - Any unscheduled maintenance during the processing of the plating lot

15. Environmental

Supplier will adhere to print and specification requirements regarding RoHS, Reach, DFARS, or other legislation limiting the use of hazardous elements and should be able to provide documentation to compliance if requested