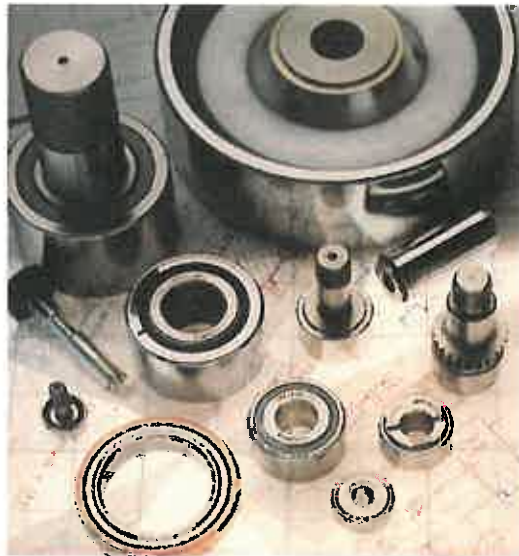


**KAMATICS CORPORATION  
SUPPLIER QUALITY  
ASSURANCE MANUAL  
Revision: B**



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## **TABLE OF CONTENTS**

### **1.0 INTRODUCTION**

- 1.1 Controlled Distribution
- 1.2 Supplier Acceptance

### **2.0 TERMINOLOGY**

### **3.0 REFERENCE DOCUMENTS AND FORMS**

### **4.0 GENERAL REQUIREMENTS: ALL SUPPLIERS AND SUBCONTRACTORS**

- 4.1 Contents
- 4.2 Kamatics Purchase Order
- 4.3 Selection of Suppliers, Assessment and Placement of Orders
- 4.4 Kamatics Qualified Suppliers
- 4.5 Performance Monitoring
- 4.6 Supplier Responsibility
- 4.7 Supplier Facility Accessibility for Kamatics Surveillance
- 4.8 Kamatics Source Inspection Requirements
- 4.9 Records

### **5.0 SUPPLIER SYSTEMS REQUIREMENTS: ALL SUPPLIERS AND SUBCONTRACTORS**

- 5.1 Quality System Requirements
- 5.2 Receiving Inspection
- 5.3 Manufacturing Control
  - 5.3.1 Frozen Plans
- 5.4 Inspection System
- 5.5 Document Control
- 5.6 Handling, Storage, Packaging, Preservation and Delivery – General Requirements
  - 5.6.1 Handling and Storage
  - 5.6.2 Packaging
  - 5.6.3 Preservation
- 5.7 Supplier Process Control
- 5.8 Supplier Sub-tier Selection
  - 5.8.1 Supplier Sub-tier Procurement
- 5.9 Control of Measuring and Test Equipment (M&TE)
- 5.10 Control of Nonconforming Product
- 5.11 Supplier Certification and Requirements

**6.0 SPECIFIC REQUIREMENTS: MACHINING AND MANUFACTURING SOURCES OF SUPPLIED PRODUCT**

- 6.1 Classification: Machining and Manufacturing Sources of Supplied Product
- 6.2 Standard Manufacturing Practice
- 6.3 Inspection Control
- 6.4 First Article Inspection Record (F.A.I.R.)
- 6.5 Inspection Method Sheet (IMS)
  - 6.5.1 Hidden Dimensions
- 6.6 External Thread Inspection Gaging Acceptability
- 6.7 Supplier Control of Sub-tier Special Processes
- 6.8 Serialized Parts
- 6.9 Product Release Documentation Requirements

**7.0 SPECIFIC REQUIREMENTS: RAW MATERIAL SUPPLIERS**

- 7.1 Classification: Raw Material Suppliers
- 7.2 Raw Material Control
- 7.3 Traceability
- 7.4 Standard and Proprietary Parts
- 7.5 Shelf Life

**8.0 SPECIFIC REQUIREMENTS: FORMED RAW MATERIAL SUPPLIERS**

- 8.1 Classification: Formed Raw Material Suppliers
- 8.2 Raw Material Control
- 8.3 Quality Assurance Requirements for Initial Deliveries
- 8.4 Process Control
- 8.5 Product Release Documentation Requirements

**9.0 SPECIFIC REQUIREMENTS: PROCESS SUPPLIERS**

- 9.1 Classification: Process Facility
- 9.2 Technical Control
- 9.3 Process Personnel Qualification
- 9.4 Heat Treat Suppliers
- 9.5 Product Release Documentation Requirements

**10.0 Kamatics Certified Suppliers**

**APPENDIX**

- Form: Supplier Concession Request – K310
- Form: Supplier First Article Inspection Record – K866
- Table 1 External Thread Inspection Methods
- Table - Record of Revisions

## **1.0 INTRODUCTION**

This manual defines the quality standards and procedures associated with performing work against manufacturing or process related purchase orders for Kamatics Corporation. Specific requirements are stated on the purchase order, blueprint, Manufacturing Sequence Drawing (MSD), or Kamatics internal procedures.

Kamatics requires each supplier to comply with the quality assurance requirements set out in this manual and to accept full responsibility for the quality of materials and workmanship, and services supplied by them against the Kamatics purchase order to which they are contractually bound.

It is subject to continuous review by Kamatics Supplier Quality Assurance and/or Purchasing Department to ensure the objectives of Kamatics Corporation are accurately reflected.

Information contained herein is the property of Kamatics Corporation and reproduction in part or in full is strictly forbidden.

This manual is subject to revision control.

### **1.1 Controlled Distribution**

The current issue of this manual shall be controlled and made available through distribution or request of the Kamatics Purchasing Department.

The supplier is responsible for adherence to the stipulated requirements of this manual as referenced on the Kamatics Purchase Order. The Kamatics Purchase Order shall take precedence in the event of conflict.

### **1.2 Supplier Acceptance**

Supplier acknowledgement of a Kamatics purchase order signifies the acceptance of terms and conditions contained within this manual at the revision level quoted on the purchase order.

## 2.0 TERMINOLOGY

- **Approved Supplier Listing:** A formal listing of suppliers approved to perform specific processes for Kamatics Corporation.
- **Certified Supplier:** A supplier who has been designated to conduct Product Verification and assume responsibility for Final Inspection and acceptance of Kamatics Product within their facility.
- **Concession:** A written approval granting authorization to release, or use a limited quantity of components, parts, or material already manufactured, but not in full compliance with the relevant drawings, specifications or other procurement documents.
- **Customer:** Kamatics Corporation
- **Designated Supplier Inspection Representative:** An inspector, employed by a Certified Supplier authorized by Kamatics Supplier Quality to accept product.
- **Designated Supplier Quality Assurance Representative (DSQAR):** An inspection representative of Kamatics authorized to accept product at the supplier's facility.
- **First Article Inspection Report (FAIR):**

A detailed inspection report typically following the AS9102 standard for First Article Inspection. The purpose of the First Article Inspection Report is to provide objective evidence that all engineering design and specification requirements are properly understood, accounted for, verified, and documented. This quality record provides a structure assuring accountability, auditing to compliance, evaluating non-conformances and evaluating corrective actions.
- **Flight Safety Part:** Any single part, component, sub-assembly, or process when designated by a Kamatics customer purchase order or blueprint requirement.
- **Frozen Plan:** A method of providing Kamatics with frozen process plans to define and control critical processes in sequential order and provides reference to support documentation. A request for frozen process plans shall be provided on the supplier Purchase Order. Frozen process plans require Kamatics approval prior to implementation.
- **Inspection Method Sheet (IMS):** A document that provides inspection requirements for each lot of components, parts, or assemblies to assure conformity of each blueprint characteristic and associated note. The IMS also provides a record that the required verifications were performed.

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- Documentation shall consist of, as a minimum, the lot size, sample size inspected, and the attribute inspection results (accept/reject).
- Individual inspection characteristics shall be performed and supported by reference to a specific measuring device that is included within the IMS documentation, as well as test reports, as required.
- **Manufacturing Sequence Drawing (MSD):** A blueprint showing the breakdown of specific manufacturing or process sequence criteria.
- **Nonconformance:** A process, condition, or feature, that does not conform to the requirements specified in the purchase order, blueprint or associated specifications.
- **Nonconforming Material Report (NMR):** A record used to document supplied product and services that exhibit nonconformity with a purchase order or blueprint (MSD) requirement, including disposition instructions.
- **Process:** A series of operations performed in the making or treatment of a product. Various types of processing operations include, but are not limited to are; machining, grinding, metal finishing, heat treating, coating, welding, NDT, forging, casting, and assembly.
- **Quality Assurance Sampling:** A specification or procedure that defines approved inspection requirements in lieu of 100 percent verification.
- **Supplier Corrective Action Request (SCAR):** A record used to request formal cause and corrective action information from a supplier for either an individual nonconformance or adverse quality trend.
- **Sub-tier:** A sub-tier is a company contracted by a Kamatics supplier or subcontractor, who provides services that, cannot be processed at their facility.

The following are examples of sub-tier services:

- Material supplier
- Heat Treat facility
- Process facility (NDT, chemical finishing plating, coating, painting, welding, grinding, etc.)
- Proprietary parts supplier

**Supplier/Subcontractor:** A company that furnishes parts, components, processes or services to Kamatics.

**Supplier Quality Performance Rating:** An analysis of data metrics used to determine a supplier's ability to satisfy Kamatics requirements.

**Supplier Instructions:** Information referenced on a purchase order; such as a process, inspection, special criteria, or certification requirements.

### **3.0 Reference Documents and Forms**

- SOP 4/2009: Interpretation of Heat Treat Specifications MIL-H-6875, AMS-H-6875 and AMS 2759 (Steel Alloys)
- SOP 10/2011: Supplier Certification Requirements
- SOP 10/1025 (Exhibit 1): Quality Assurance Sampling – General Requirements
- SOP 10/1029: Control of Nonconforming Product
- SOP 10/3019: Certified Supplier Requirements
- WI-10/3013-25:
- FORM 10/1002-1: First Article Inspection Record
- FORM 10/1013-1: Inspection Method Sheet
- FORM 10/1013-1.1: Inspection Method Sheet – Supplier Source Inspection Version
- FORM 10/1015-1: Supplier Quality System Evaluation Survey
- FORM 10/1026-1: Corrective/Preventive Action Request
- K034: Nonconforming Material Report
- K310: Supplier Concession Request
- K417: Supplier Performance Rating

## **4.0 GENERAL REQUIREMENTS: ALL SUPPLIERS AND SUBCONTRACTORS**

### **4.1 Contents**

Specific sections of this manual are applicable to all suppliers performing work to a Kamatics purchase order or their sub-tier. Applicable sections of this manual are dependent on the services provided and are designated accordingly.

- Applicable to all suppliers or subcontractors – (Section 5.0)
- Machining and manufacturing sources of supplied product - (Section 6.0)
- Raw Material Suppliers (mills and distributors of raw materials, standard hardware, and manufacturer/distributor of proprietary items) - (Section 7.0)
- Formed Raw Material Suppliers (forgings, castings, stamping, etc.) - (Section 8.0)
- Process Suppliers (Heat Treat, NDT, Metal Finishing, Shot Peen, Welding, etc.) – Section (9.0)

### **4.2 Kamatics Purchase Order**

The Kamatics purchase order is computer generated and provides standard information that includes, but is not limited to:

- Supplier name and address
- Purchase Order revision status
- Part number and current revision
- Product Nomenclature
- Quantities ordered by line item
- Delivery due dates
- Manufacture or process requirements as specified on the associated blueprint or “MSD”
- Mandatory quality assurance requirements and applicable clauses
- Reference to specific process instructions, or procedures
- Reference to the current issue of the Supplier Quality Assurance Manual
- “Terms and Conditions”

Kamatics will ensure that complete and specific work instructions are documented on Purchase Orders. Verbal Instructions without written notification are considered invalid. Verbal instructions to a supplier must be documented with either a B/P revision and/or Purchase Order instruction.



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## 4.3 Selection of Suppliers, Assessment and Placement of Orders

The control of all purchased material and services is the responsibility of the Kamatics Purchasing Department. Kamatics Quality Assurance has the following supporting responsibilities:

- Assessing/Auditing a Supplier's quality system and/or process capability
- Monitoring Supplier Quality performance
- Determining the acceptability of product, materials and services
- Initiating corrective actions

The initial Quality Assurance assessment of a supplier will be initiated by a request from the Purchasing Department.

The purpose of the assessment is to establish that the supplier has the facilities, organization and procedural controls necessary to ensure that the supplies and services ordered are received at Kamatics in accordance with the requirements contained in this document, as well as those specified on the purchase order, blueprint/MSD, and applicable technical specifications.

Personnel responsible for this assessment will primarily be members of the Kamatics Quality Assurance Department, but may be accompanied by additional Company personnel whose technical expertise may be required.

## 4.4 Kamatics Approved Suppliers

Upon selection, a Kamatics approved supplier must continuously demonstrate the ability to comply with quality and delivery criteria specified in 4.5, Performance Monitoring. Suppliers that fail to meet performance criteria requirements are monitored and evaluated for continued approval status.

In addition, suppliers who perform special processes directly to Kamatics, and whose finished product cannot be physically verified (such as; NDT, chemical processing, plating, heat treat, etc.) will be subject to initial and periodic audit surveillance in accordance with Standard Operating Procedure (SOP) requirements. Periodic process audits shall be performed approximately every three years, as a minimum.

Corrective action generated during on-site surveillance shall be the responsibility of the supplier. The supplier's quality management representative shall provide a comprehensive response in support of compliance with noted violation against specification and industry specified requirements.

Subcontract machine suppliers and raw material providers shall be issued an initial mail-in Quality System Evaluation Survey, Form 10/1015-01, to ensure their capability to perform the required service to the satisfaction of Kamatics and industry quality standard requirements. Subcontract machine supplies and raw material providers are subject to periodic mail-in surveys at a minimum frequency of once every two years. Kamatics Supplier Quality may be required to perform an on-site audit at the suppliers' facility to ensure compliance with purchase order and/or industry standard quality systems requirements.

Supplier assessment may consist of, but not be limited to, on-site quality system audit, or process/product surveillance, as required.

#### **4.5 Performance Monitoring**

Kamatics shall monitor and evaluate the quality and delivery performance of each supplier with activity on a quarterly basis. A Supplier Performance Rating Report, Form K417 shall be submitted to the supplier for each quarter via a Supplier Performance Rating Scorecard.

Quality metrics shall consist of details for each purchase order line item rejection. The quality rating shall be based on the number of lot rejections against orders received within each fiscal quarter.

Rejections can be caused by nonconformity detected with or during:

- Deliverable material
- Accuracy and completeness of certification documents
- Providing all documentation required with the specific line item delivery
- Receiving inspection
- Further processing at Kamatics

Grading does not take into account the number of specific rejections against a purchase order line item. Each rejection is considered as equal importance in terms of inconvenience, and therefore it is provided the same corrective action initiative to prevent recurrence.

A suppliers' performance shall also be measured against on-time delivery criteria established at the time of purchase order acceptance.

The minimum acceptable supplier rating for both quality and delivery shall be 95 percent.

A supplier quality or delivery rating of less than 95 percent will be subject to quarterly review by Quality and Purchasing Management to determine any appropriate actions taken to correct poor performance or deteriorating trends with suppliers.

The quarterly review process shall consist of documented evidence of any actions taken for each individual supplier that does not meet the established criteria.

Both quality and on-time delivery criteria are of equal measure and shall be taken in account when determining continued approved supplier status.

The supplier shall be notified of product nonconformity at the time of rejection via a Nonconforming Material Report (NMR).

#### **4.6 Supplier Responsibility**

The supplier is responsible for:

- Prior notification of change in product and/or equipment/process, procedures that may affect Kamatics parts, changes of suppliers, changes of manufacturing facility location or new satellite additions and, where required, obtain organization approval.
- Assuring the appointment of appropriately qualified personnel with the responsibility and authority for manufacture and quality assurance. Information regarding organization structure, including managerial appointments with responsibilities in those functional areas must be made available to Kamatics upon request.
- Proper notification of any changes or problems that could affect conformance to contractual specifications and/or delivery dates.

#### **4.7 Supplier Facility Accessibility for Kamatics Surveillance**

Purchase order driven "Terms and Conditions" afford Kamatics and their customers' access to the supplier's facility for audit (quality/process), inspection of product, or review of methods and/or manufacturing control procedures as required.

Surveillance requirements must be properly flowed down to all sub-tiers involved in the manufacture or processing of Kamatics parts.

#### **4.8 Kamatics Source Inspection Requirements**

When source inspection is specified on the purchase order or by written request, the supplier will be responsible for proper notification of product availability to Kamatics Supplier Quality through the applicable Purchasing Representative. A mutually agreed upon date and time will be scheduled accordingly.

A three (3) day advance notification by the supplier is requested for timely scheduling. Source inspection may be waived only by written acknowledgement by either the Kamatics Supplier Quality Assurance or Purchasing Representative.

Source inspection activity shall be documented on a Kamatics Inspection Method Sheet (IMS), by a Kamatics quality representative for objective evidence of on-site verifications. A copy of the inspection record shall become part of the supplier certification package upon product acceptance by the Kamatics "DSQAR". Product released without source inspection when stipulated by purchase order is subject to return and withheld payment.

Kamatics acceptance of product during source inspection does not absolve supplier responsibility to provide conforming product, or preclude rejection during subsequent inspection, or during further processing, if found defective.

#### **4.9 Records**

Supplier records shall be maintained to provide evidence of conformity to purchase order requirements. Records shall remain legible, readily identifiable, storage protected, effectively retained and easily retrievable.

Paper records shall be stored in a suitable environment and in a manner appropriate to facilitate retrieval and to preserve document condition and integrity.

Electronic records shall be protected from loss or damage via system backup programs.

Supplier quality records shall be maintained for a minimum of 10 years unless otherwise specified.

## **5.0 SUPPLIER SYSTEMS REQUIREMENTS: ALL SUPPLIERS AND SUBCONTRACTORS**

### **5.1 Quality System Requirements**

The supplier shall maintain a documented quality system designed to ensure compliance with the requirements specified on the Kamatics purchase order. The quality system shall as a minimum ensure:

- Control of product quality throughout all areas of contract performance.
- Prevention and ready detection of nonconformance, with timely and positive corrective actions.
- Personnel performing quality related functions shall have sufficient, well-defined responsibility, authority, and the organizational freedom to identify and evaluate quality problems, and to initiate, recommend, or provide solution.
- Personnel shall receive the necessary training relative to tasks assigned.

The supplier shall provide Kamatics Representatives:

- All reasonable assistance, access to facilities and equipment to assure safety, and provide for the performance of tasks assigned to Kamatics personnel while on-site.
- Copies of all documentation and records, as required by the purchase order upon request by Kamatics or their customer.

### **5.2 Receiving Inspection**

Incoming materials and parts shall be subject to adequate inspection as necessary to assure conformity to contractual requirements prior to additional processing. The supplier shall maintain a documented system for the control of incoming product.

### **5.3 Manufacturing Control**

The supplier shall establish and maintain manufacturing controls with work instructions.

The supplier shall incorporate specified inspection points in the manufacturing process as required. A system of inspection points (first pc. in-process, final, etc.) shall be performed to ensure that all items conform to Kamatics purchase order, drawing, and specification requirements.

When purchase orders, drawings, and specifications state that product is subject to special controls, provisions shall be made to incorporate internal manufacturing documentation accordingly to assure compliance.

The supplier must ensure that contracted work cannot be initiated until all applicable documents relating to the purchase order are received.

### **5.3.1 Frozen Plans**

The supplier shall not amend Manufacturing or Process plans approved by Kamatics without documented authorized approval by a Kamatics Engineering or Quality Assurance representative.

## **5.4 Inspection System**

The supplier shall establish and maintain a documented inspection system for the control of subcontracted supplies, processes and services in addition to internal requirements. The supplier's quality system shall provide for the early detection of conditions in manufacture that are likely to affect product quality.

The supplier is responsible for assuring that all such materials and product conform to the Kamatics purchase order, blueprint/MSD and specification requirements in their entirety. Kamatics Supplier Quality Assurance may be requested to assist the supplier in fulfilling contractual requirements to assure product conformity as required.

## **5.5 Document Control**

The supplier shall maintain a system to record, acknowledge, and control the receipt of drawings, specifications, and instructions.

The suppliers' document control system shall ensure that the current revision/amendment of purchase orders, drawings, specifications, technical requirements, and engineering changes are available during manufacture and inspection. All changes shall be processed to assure incorporation at the desired effectivity points. Records of documentation change requests shall be controlled for compliance.

The system shall ensure that the location and issue of all documents in circulation are implemented in a controlled manner and that all obsolete issues are withdrawn from use.

Kamatics supplied documents shall be monitored to prevent deterioration during use. Damaged or illegible drawings and documents shall be replaced by contacting the Kamatics Purchasing Department prior to use.

The supplier is responsible for assuring that all such materials and product conform to the Kamatics purchase order, blueprint/MSD and specification requirements in their entirety.

## **5.6 Handling, Storage, Packaging, Preservation and Delivery – General Requirements**

The following requirements are in addition to any specific information dictated on the blueprint or purchase order. In the event of conflict, specific requirements stated on the Kamatics purchase order shall take precedence over the blueprint or the requirements of this manual.

### **5.6.1 Handling and Storage**

All parts and components within the supplier's possession or their facility must be protected at all times against contamination, corrosion, damage, deterioration and the entrance of foreign object debris/damage (F.O.D.).

### **5.6.2 Packaging**

Product must be adequately packaged to avoid damage by contact with one another or by contact from an external source. Special considerations must be given to chemically plated or coated parts that are susceptible to chipping and/or impact impressions.

Parts or components that are finished, or highly surface textured, or have geometrical configurations susceptible to scratches, nicks or dings, shall be packaged in such a manner to eliminate potential damage and subsequent rework conditions. Product that falls into these categories shall be individually isolated from potential impact using a combination of protective foam, bags, and other contact resistant materials as required.

Kamatics product supplied for further processing is typically packaged in suitable tubs, trays and containment that can generally be used for supplier return of parts. When determined to be unacceptable for transit, the supplier is responsible for taking the precautionary measures required to assure product arrives damage free at Kamatics. In the event the supplier cannot adequately protect finished product for shipment, Kamatics Purchasing must be contacted to coordinate the activity.

Where parts require serialization, the part, lot, and serial numbers shall be affixed on the outside of the individual packaging or containment for traceability purposes. Outer packaging must be rigid enough to properly support the content weight.

### **5.6.3 Preservation**

Supplied materials that are susceptible to corrosion (i.e. AISI 4340, 300M, C250) must be protected during all stages of manufacture and during shipment. Where temporary preservation is used for protection against corrosion, these substances must not be incompatible, cause damage, or deterioration of the product. Preservation that cannot be readily removed from the parts shall not be used. Special consideration should be given when using heavy oils on parts with blind holes or recesses. A combination of light oil and V.C.I. (Vapor Corrosion Inhibitor) paper or “ZeRust” bags may be preferable to eliminate removal concerns during cleaning. Preservation concerns should be forwarded to Kamatics Purchasing when material compatibility issues exist.

## **5.7 Supplier Process Control**

Suppliers shall maintain written procedures and instructions for the following system requirements; operating techniques, manufacturing, processing, operator qualifications preservation, packaging, shipping, inspection, and testing. The supplier shall also include the necessary information/instruction in their procurement documents to assure that all applicable requirements of the purchase order are implemented by their sub-tier sources.

Supplier procedures, written instructions and other supporting documentation shall be made available for review by the Kamatics Quality Representative upon request, and subject to disapproval if determined to be inadequate for the intended purpose. Kamatics Supplier Quality shall approve supplier procedures, written instructions, NDT, Shot Peen and other process techniques prior to work release when stipulated on the purchase order.

### **5.7.1 Use of Markers on Metallic Parts**

Due to the presence of chlorides and other chemicals, the use of standard felt ink markers such as standard Sharpies® cause surface corrosion when applied to metallic parts. For this reason, markers of this type should not be used on metallic parts/components. Markers are available in “High Purity” or “Low Chloride” grades that are approved for aerospace. Brands of high purity markers include:

- Sharpie TEC®
- Markal®
- Dykem®
- Arro®
- JP Nissen®

These manufacturers offer Certified Test Results documenting the level of chlorides by batch and are safe for use on metallic parts and components. These options may be used on metallic parts and components as required.



## **5.8 Supplier Sub-tier Selection**

Supplier sub-tier selection shall be in accordance with 6.7 requirements.

### **5.8.1 Supplier Sub-tier Procurement**

When Kamatics personnel are required at the supplier's sub-tier, this activity shall be coordinated through the supplier's quality organization under the direction of the Purchasing department. The supplier shall require his sub-tier to provide access and assistance in accordance with 5.1 requirements.

## **5.9 Control of Measuring and Test Equipment (M&TE)**

The supplier shall provide for the initial and periodic calibration of M&TE used for the inspection or acceptance of parts. Measuring and test equipment shall be calibrated against standards that are traceable to the National Institute of Standards and Technology (N.I.S.T). If N.I.S.T. standards are not available, industry standards may be used to satisfy this requirement.

The supplier calibration system must be controlled to the extent necessary to assure accuracy requirements are retained within their established calibration recall schedule. M&TE must be verified at regular intervals in accordance with approved procedures acceptable to Kamatics Supplier Quality Assurance. The minimum requirements include, but are not limited to the following:

- The frequency of calibration shall be controlled by an established procedure based on the type of equipment, usage, the ability to retain accuracy within its established recall schedule, and environmental conditions that the equipment is subject to.
- Documentation records must be maintained with actual dates, and results of calibration.
- All M&TE must indicate its current calibration status.

M&TE that is unable to be verified on-site must be sent to an approved calibration facility capable of providing services in accordance with the current revision of ANSI/NCCL Z540.1, Calibration Laboratories and Measuring and Test Equipment – General Requirements.

Tooling: The supplier shall establish a system, which provides accountability, identification, and maintenance of tooling. Jigs, fixtures and templates used for inspection, or test media shall require periodic inspection in accordance with the same calibration requirements as specified in this section.

The system shall establish the extent and frequency of the verification, and identify tools with current calibration status. In addition, these inspection aids must be verified to assure accuracy prior to use.

The supplier is responsible for ensuring that all M&TE, tools, jigs, fixtures, templates and Mylar's on loan from Kamatics are properly received and that calibration status is maintained during use and possession at their facility.

Kamatics supplied M&TE and inspection aids received in a defective condition, damaged at the supplier's facility, or with suspected accuracy malfunction, shall be immediately quarantined for Kamatics disposition. Product manufactured or inspected prior to the nonconformity being detected shall also be quarantined pending internal and/or Kamatics disposition. All suspect materials or parts shall be re-inspected for conformity to blueprint requirements using known calibrated M&TE prior to acceptance, and release for further processing or shipment.

M&TE or tooling furnished to the supplier shall not be altered or modified without written approval from Kamatics. These instructions also apply to tooling fabricated or procured by the supplier for Kamatics product as part of the purchase order.

Mylar's shall be inspected for proper revision level, and condition prior to use. The supplier shall establish adequate controls for Mylar application (i.e., usage, storage, recording, out-of-tolerance condition, operator training, etc.).

M&TE and tooling on loan must be clearly identified by the supplier as Kamatics owned equipment.

#### **5.10 Control of Nonconforming Product**

Materials and product that does not comply with the requirements stated in the Kamatics purchase order, blueprint, "MSD" or applicable specifications in their entirety shall be considered "nonconforming".

Suppliers shall establish and maintain procedures for the identification and segregation of nonconforming material (manufactured, procured, contracted, and/or subcontracted).

Nonconforming product shall be suitably identified and segregated from conforming product of the production lot.

Under no circumstances shall the supplier accept and, in turn, ship product that contains nonconforming characteristics, which dimensionally, functionally, or metallurgically violates Kamatics drawing or specification requirements without authorized approval from Kamatics.

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Nonconforming product may be reworked to blueprint or “MSD” specified dimensional tolerances without Kamatics authorization with the exception of frozen plan designated requirements. Nonconforming product due to processes that could affect material metallurgical properties (heat treating, nitriding, etc.) must obtain written approval authorization from Kamatics Design Engineering via concession application prior to any reprocessing attempt. Rework process plans must clearly demonstrate the capability to comply with blueprint and specification requirements.

Nonconformities such as visual anomaly defects or dimensional deviation, caused by surface enhancement processes (plating, coating, etc.) may be stripped and/or reprocessed no more than one (1) additional time without written authorization from Kamatics. It is the responsibility of the surface enhancement facility to maintain and provide documentation for all additional re-processing performed as required.

Nonconforming product that cannot be reworked or reprocessed to meet drawing or specification requirements may be submitted for consideration on a concession to Kamatics.

Concession applications shall be submitted to the applicable Kamatics Purchasing Representative for disposition processing on “Supplier Concession Request” form (K310).

Acceptance of nonconforming material is the sole prerogative of Kamatics Design Engineering or its customer contractual requirements. An approved concession, at any time, can be reversed and deemed unacceptable to Kamatics and returned to the supplier as nonconforming.

Reworked parts shall be re-inspected for conformity and documented prior to shipment.

Any further processing of product subject to concession application is at the supplier’s own risk prior to written confirmation of disposition by Kamatics Design Engineering.

The concession application shall clearly indicate the cause of the nonconformity and include a comprehensive corrective/preventative action plan to prevent reoccurrence.

Nonconforming product subject to concession application must be clearly identified by affixing a label to each nonconforming part or container to assure proper traceability. The supplier documentation package shall include the concession number for the discrepant product submitted.

Nonconforming product identified at the time of delivery to Kamatics will be documented on a Nonconforming Material Report (K034). Nonconforming product returned to the supplier for rework must be re-submitted to Kamatics with documented reference to the NMR rejection number.

The supplier shall ensure that any remaining product at his facility is not also affected, and shall take all necessary actions to prevent reoccurrence.

In the event parts manufactured from Kamatics issued material (bar, plate forging, casting, etc.) are scrapped at the supplier's facility, the Kamatics Purchasing Representative must be immediately informed to negotiate replacement of material to fulfill purchase order requirements.

Depending on the type and severity of the nonconformity, a Supplier Correction Action Request (SCAR) shall be generated and submitted to the supplier for action response. The supplier shall supply a detailed explanation for the root cause and corrective measures taken to prevent reoccurrence. A completed and approved response is required on or before the due date indicated on the SCAR.

Failure to respond to a corrective action request may result in supplier disapproval and suspension of future deliveries and orders.

Suppliers' are not authorized to conduct material review action on a nonconformance that will result in departure from the requirements of the Kamatics drawing or specification. Nonconforming material must have documented review and disposition by Kamatics Design Engineering.

## **5.11 Supplier Certification and Requirements**

All materials and product submitted to Kamatics shall be furnished with a certification in compliance with SOP 10/2011 (Supplier Certification Requirements) when specified on the Kamatics Purchase Order.

- The supplier's Quality Manager or authorized designee must sign and date the Certificate of Compliance stating their level of responsibility. A listing of supplier authorized signatures and their job title shall be made available to Kamatics on request.

## **6.0 SPECIFIC REQUIREMENTS: MACHINING AND MANUFACTURING SOURCES OF SUPPLIED PRODUCT**

### **6.1 Classification: Machining and Manufacturing Sources of Supplied Product**

A machining or manufacturing source is defined as a supplier who performs:

- The manufacture of components and parts
- Specific machine generated processes (grinding, milling, honing, etc.)

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A machining or manufacturing supplier may be required via the Kamatics purchase order to provide a finished item, complete, with processes and testing in accordance with the blueprint and purchase order requirements.

## 6.1.1 A machining or manufacturing supplier may, or may not:

have capability to perform processes such as heat-treatment, or plating within their own facility, but may be required to sub-contract these additional process requirements. Regardless of internal processing capability, or when offloading sub-contract requirements, the following restrictions shall apply unless otherwise specified.

- Only Nadcap accredited sources shall be used for processing of Kamatics parts.
- When specified on the Kamatics Purchase Order, the supplier must use Kamatics designated, or Kamatics customer approved sources for the specific process or processes designated. The supplier may or may not be Nadcap accredited.

## 6.2 Standard Manufacturing Practice

Standard manufacture of Kamatics parts shall not deviate from blueprint or MSD specified requirements. Unless otherwise specified, standard conventional metal removal processes (turning, milling, grinding, etc.) of dimensional parameters shall be at the discretion of the supplier providing conformity with tolerance and surface finish requirements have been achieved. Nonconventional machining methods (electrical discharge, electrochemical, chemical milling, ultrasonic, etc.) are prohibited unless otherwise specified on the purchase order or blueprint, or by written authorization from the Kamatics Engineering authority. Surface enhancement processes (grit/vapor blast, glass bead, tumbling, chemical processing, plating/coating, etc.) are prohibited unless otherwise specified on the purchase order or blueprint, or by written authorization from the Kamatics Engineering authority.

All deburring operations are to be performed using virgin Stainless Steel (SS) materials only. The use of carbon steel wire wells is prohibited.

## 6.3 Inspection Control

The supplier must perform adequate inspections to ensure that all finished product is compliant with blueprint and specification requirements.

Inspection operations shall be conducted in accordance with internal procedures that detail each manufacturing cycle and indicate the methods of inspection used.

# Kamatics Corporation

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**KAMAN**

All internal inspections and Kamatics required documents (FAIR, IMS, etc.) shall be validated by an approved stamp or authorized signature for proper identification of the supplier and the individual inspector responsible for product acceptance.

The use of authorized inspection stamps or signatures shall be documented and controlled by the supplier's Quality Manager and restricted to the assigned inspector only.

The procedure shall maintain a record of issue, and withdrawal of personnel stamps and signatures. Company issued stamps/approved signatures is unique to the assigned person, and should for any reason be revoked, or the individual is no longer employed, then it cannot be reissued to any other candidate for a minimum of six months.

## 6.3.1 Hardness Testing

Hardness testing shall be in accordance with Section 9.4.1.

## 6.3.2 Spherical Ball Inspection Standards

Spherical Ball Visual Inspection criteria shall be in accordance with WI-10/1013-25.

## 6.4 First Article Inspection Report (FAIR)

- **FAIR:** The supplier shall provide a FAIR that details the inspection, verification and documentation of the first production run of a new part, or following any subsequent change that invalidates the previous FAIR. Each FAIR shall account for:
  - Part number and revision.
  - Product accountability – Raw material, Specifications, Special Processes and Test Verifications.
  - Characteristic accountability – including each drawing characteristics including notes.
    - Each drawing characteristic shall be recorded with actual values and reference the specific measuring device utilized to validate the characteristic. General notes, such as “complies” or “accepted” for dimensional characteristics are not acceptable. The supplier shall utilize the Kamatics provided Inspection Method Sheet (IMS) to determine the specific measuring method for each characteristic.

A new FAI is required under the following circumstances:

- a. New part manufacture.
- b. Lapse of production of a specific part of two (2) years or more
- c. Significant change in manufacture equipment or processing methods
- d. Written request by Kamatics Quality

A Partial (Delta) FAI is required under the following circumstances:

- a. Design change / revision change.
- b. A change in the method of manufacture (e.g. Tooling, Process, sequence of manufacture, change in sub-tier)

The supplier is encouraged to use AS9102 approved forms. In the event that the supplier does not have an AS9102 form they may request a copy of the Kamatics form (Form K866) by contacting the appropriate Kamatics Purchasing Representative or Receiving Inspection Coordinator.

First article parts shall be identified as "First Article" by paper tagging or any other suitable means of identification. The First Article Part along with the completed "FAIR.", and associated certifications as specified in section 5.11 shall be included in the shipping documents.

In the event that the FAIR has been rejected by Kamatics the supplier shall place the production order on hold in a secured bonded area. The parts shall not be released until such time that a subsequent approved First Article has been received by the supplier.

## **6.5 Inspection Method Sheet (IMS)**

Upon acceptance of a purchase order, the subcontractor is responsible for assuring that a Kamatics Inspection Method Sheet (IMS) is available for documenting characteristic inspection results prior to release for shipment.

The supplier is responsible for contacting Kamatics Purchasing or Receiving Inspection Coordinator in the event the IMS has been inadvertently omitted in the contract package.

A completed IMS is required for each purchase order line item shipment. Unless otherwise specified, inspection criteria shall be in accordance with the current issue of the Kamatics Sampling Plan (SOP 10/1025, Exhibit 1).

The supplier shall include a copy of the original IMS with the certification package and shipment. A copy shall be retained for correlation of inspection results if required.

### **6.5.1 Hidden Dimensions**

The supplier shall make provisions within the inspection system for blueprint dimensions that are inaccessible subsequent to further processing such as plating, coating and metal finishing. When a supplier is contracted to provide such services, in addition to part manufacture, a record of hidden dimensions shall be documented and on file for objective evidence of feature compliance prior to additional processing. Hidden dimension inspection records shall be on file at the suppliers' facility and made available for review

upon Kamatics request. In addition, the suppliers' Certificate of Conformity shall attest to dimensional compliance with blueprint specified hidden dimensions. Attribute inspection methods shall be sufficient in support of hidden dimension verification compliance.

## **6.6 External Thread Inspection Gaging Acceptability**

A machining or machining source as defined in 6.1 - 6.1.1 that has been contracted to generate an external thread in accordance with a Kamatics blueprint or manufacturing sequence drawing (MSD) shall perform thread feature verification in accordance with Table 1 gaging requirements (*See Appendix*).

A manufacturer of threaded parts and components that sub-contracts thread generation requirements shall ensure that Table 1 is properly flowed down to sub-tier sources for compliance with section 6.7, Supplier Control of Sub-tier Special Processes.

## **6.7 Supplier Control of Sub-tier Special Processes**

When the Kamatics purchase order specifies the supplier to administer sub-tier requirements of the drawing, including processing, the following shall apply:

- a. Sub-contract process requirements shall be in accordance with 6.1.1.
- b. The supplier shall ensure Kamatics purchase order requirements are properly flowed-down to sub-tier sources for compliance with drawing and specification requirements.
- c. Kamatics and its customers' shall at any time, be afforded on-site access to a sub-tier facility for the purpose of oversight of contracted product, or to perform quality and/or process related surveillance in support of compliance as required.
- d. Sub-tier process certification requirements shall be in compliance with SOP 10/2011 (Supplier Certification Requirements) in accordance with section. 5.11

## **6.8 Serialized Parts**

Kamatics parts that require serialization shall be identified on the purchase order or blueprint/"MSD". Serial number allocation responsibility shall be documented on the purchase order. When serial numbers are provided or assigned internally, the supplier shall maintain logs for traceability purposes.



## **6.9 Product Release Documentation Requirements**

The supplier's Certificate of Conformity and any Sub-tier processing activity shall be in compliance with SOP 10/2011 (Supplier Certification Requirements) per section 5.11. Any open concession must be referenced on the Certificate of Conformity and associated parts tagged to indicate that they are subject to concession disposition. A concession that has been accepted by Kamatics shall be referenced on the certification for proper traceability.

Suppliers shall maintain a record of sub-tier activity for Kamatics purchase order requirements. Sub-tier certifications and test reports must be included in the supplier documentation package.

## **7.0 SPECIFIC REQUIREMENTS: RAW MATERIAL SUPPLIERS**

### **7.1 Classification: Raw Material Suppliers**

- a. A raw material supplier is defined as a provider of both metallic and nonmetallic materials in the form of bar, sheet, plate, tube, composites or liquid form, obtained either from its original source of manufacture (mill) or from a distributor.
- b. A standard hardware supplier is defined as a provider of finished items controlled by specifications issued by National or Aeronautical Agencies. Standard hardware may consist of product such as washers, nuts and bolts.
- c. A distributor of proprietary products is defined as an accredited selling agent for a manufacturer of product whose design and manufacture are exclusively owned under a trademark or patent.

### **7.2 Raw Material Control**

Kamatics product defined by the drawing, as being Flight Safety, Vital Part, Critical, or Class 1 shall be explicitly denoted on the purchase order. Raw material obtained for Flight Safety, Critical or Class 1 parts shall be procured from a Kamatics, or Kamatics customer-approved source.

Raw materials purchased for a Kamatics purchase order must only be produced from mills in the United States or a qualified country as defined in the Kamatics standard purchase order clause.

Raw materials produced outside of the United States or a qualified country shall be accepted when authorized by Kamatics Purchasing in writing.

### **7.3 Traceability**

Raw material suppliers and distributors are responsible for ensuring that raw material and standard parts are traceable to the original source of manufacture.

Raw material procured by, or for Kamatics through a mill or distributor shall be furnished with a copy of the original manufacturers' mill certificate, and any other related test data to provide an unbroken chain of traceability. Supplier Certification Requirements shall be in accordance with SOP 10/2011 requirements.

Standard hardware delivered to Kamatics shall be furnished with a copy of the supplier Certificate of Conformity in compliance with SOP 10/2011 (Supplier Certification Requirements). Exceptions to criteria requirements shall be stated on the Kamatics Purchase Order. Kamatics shall, on request, have access to all documentation relating to original sources of manufacture and reserve the right to audit those sources, as required.

Proprietary product delivered to Kamatics shall be provided with the supplier's Certificate of Conformance that confirms compliance with the declared specification or standard.

#### **7.4 Standard and Proprietary Parts**

Standard and proprietary parts ordered by Kamatics part number shall be strictly in accordance with the Kamatics drawing requirements.

#### **7.5 Shelf Life**

Suppliers of non-metallic raw materials must indicate any applicable shelf life and expiration date limitations on their Certificate of Conformity, in addition to containment and/or packages.

Suppliers of seals and other rubber items shall ensure goods supplied are less than 12 months from the cure date on dispatch except where authorized in writing by the Kamatics Quality Department.

All items shall be supplied in adequate commercial packaging to prevent damage or deterioration of product.

### **8.0 SPECIFIC REQUIREMENTS: FORMED RAW MATERIAL SUPPLIERS**

#### **8.1 Classification: Formed Raw Material Suppliers**

A supplier of formed raw material is defined as:

- a. A forge, that produces forgings or stampings from basic raw bar stock
- b. A foundry that produces castings, or cast bar form basic raw material
- c. A mill, that produces ingots, rolled, forged or extruded sections

A supplier of formed raw materials may be required to supply directly to Kamatics or its supplier.

## **8.2 Raw Material Control**

Kamatics product defined by the drawing, as being Flight Safety, Vital Part, Critical, or Class 1 shall be explicitly denoted on the purchase order. Raw material obtained for Flight Safety, Critical or Class 1 parts shall be procured from a Kamatics, or Kamatics customer-approved source.

Raw materials purchased for a Kamatics purchase order must only be produced from mills in the United States or a qualified country as defined in the Kamatics standard purchase order clause.

Raw materials produced outside of the United States or a qualified country shall be accepted when authorized by Kamatics Purchasing in writing.

Forging or casting suppliers are allowed to procure raw material through their own sources provided that sufficient controls are in place to assure compliance with specification and quality requirements.

Kamatics reserves the right to request the use of Kamatics or their customers approved material sources when the supplier does not meet specified requirements.

Scrap allowance is not covered against any purchase order. Unless otherwise specified, formed raw material suppliers can only issue the contracted amount indicated on the purchase order.

Surplus product delivered to a machining facility may be required via purchase order terms to be held in inventory at the supplier's facility pending additional requirements.

Supplier Certification Requirements shall be in accordance with SOP 10/2011 requirements.

## **8.3 Quality Assurance Requirements for Initial Deliveries**

The initial purchase order or line item for forgings, castings, or stampings, shall be subject to First Article inspection in accordance with 6.4. The part shall be documented with variable dimensional data for features, test results, and other parameters specified in the purchase order and drawing.

## **8.4 Process Control**

A Formed Raw Material supplier as specified in 8.1 may, or may:

Not have capability to perform processes such as heat-treatment or plating within their own facility, but may be required to sub-contract these additional process requirements. Regardless of internal processing capability or when offloading sub-contract requirements, the following restrictions shall apply unless otherwise specified.





















