
	<p>Visioneering Procedure</p> <h1>Digital Product Definition</h1>	<p>Doc #: VQA.PR.15 Rev Date: 10/29/10 Page 1 of 6</p>
<p>Performed by:</p>	<p>Designers, Inspectors, NC Programmers, Job Processors, Program Managers</p>	
<p>Approved by:</p>	<p>Quality Assurance Director</p>	

1.0 PURPOSE AND SCOPE

- 1.1 To ensure secure storage with access control and archiving for customer supplied DPD data and derivative data, including control of obsolete derivatives.
- 1.2 To ensure that dataset translations are verified and that derivative datasets are traceable to the current authority dataset.
- 1.3 Defines the responsibilities for ensuring that DPD processes are in accordance with customer requirements, and that changes to the DPD processes are communicated to and approved by customers requiring notification.

2.0 DEFINITIONS AND ABBREVIATIONS

- 2.1 DPD/MBD: Digital Product Definition / Model Based Definition – a 3D representation of the product viewable on a Computer Aided Design (CAD) system.
- 2.2 Authority Dataset: The CAD model and any accompanying documents such as 2D drawing sheets, engineering requirements, notes lists, parts lists, etc. as received from the customer.
- 2.3 Derivative Dataset: The media created when data is extracted from an authority dataset for machine programming, tool fabrication and measurement.
- 2.4 PAS: Product Acceptance Software – DPD software used to inspect and accept product.
- 2.5 CMS: Coordinate Measuring Systems (*also known as CAMS: Computer Aided Measurement Systems and CAI: Computer Aided Inspection*) – measurement equipment such as CMMs, Laser Trackers and NC machinery with inspection probe capability.
- 2.6 PCMS: Portable Coordinate Measuring Systems – see 2.5 above.
- 2.7 SQA: Supplier Quality Assurance – the QMS Representative is the designated SQA as well as the Lead Internal Auditor.
- 2.8 ROR: Resource Outsource Requisition
- 2.9 TIR: Tool Inspection Record
- 2.10 SOW: Statement of Work

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3.0 PROCEDURE

3.1 DPD PROCESS

- 3.1.1 The designated DPD representative is the QA Director. The QA Director is responsible for maintenance of this procedure, as well as revisions, additions or deletions as required for control of new DPD operations.
- 3.1.2 The QA Director is responsible for ensuring that customers are notified of any changes to processes, CAD/CAM/CAI software, and measurement equipment within 30 days.
- 3.1.3 Data movement is documented by the Data Administrator on a Data Transmittal Request form. The Data Administrator forwards the DTR to the Program Manager and assigned departmental points of contact and moves the dataset to the appropriate V: folder.
- 3.1.4 The DPD process is graphically depicted in the DPD Process Flow Diagram referenced in Section 4 below.

3.2 CONFIGURATION MANAGEMENT AND MEDIA SECURITY

- 3.2.1 Datasets are stored in V: drive as depicted in the DPD Process Flow Diagram.
 - Datasets received for quoting purposes are stored in V: Engineering.
 - Datasets authorized for use in design are stored in V: Design Release.
 - Datasets authorized for use in manufacturing and inspection are stored in V: Manufacturing Release.
 - NC Machining, Inspection and Build Department dataset derivatives are stored in V: folders named for that department as depicted in the DPD Process Flow Diagram.
 - Dataset derivative file names include the authority dataset source and revision level.
- 3.2.2 All data release folders in V: are access controlled.
 - The authority dataset in V: Manufacturing Release is not alterable, and only trained Data Administrators may access their respective V: folders in order to create or modify dataset derivatives.
 - Only the current authority datasets are available for use in production and inspection. Data Administrators move obsolete datasets to their respective obsolete folders; obsolete folders in each V: folder can only be accessed by Data Administrators.
 - Permissions and passwords are controlled by the IT Systems Administrator.
- 3.2.3 The IT Systems Administrator backs up the network daily. Backup tapes are stored off-site from the server room.

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3.3 PRODUCT ACCEPTANCE SOFTWARE

- 3.3.1 All changes to PAS are documented and approved by the QA Director. The QA Director is responsible for ensuring that PAS is verified prior to use.
- 3.3.2 The PAS artifact is stored in the secured inspection equipment cabinet. Certification of the PAS artifact was conducted by an ISO/IEC 17025 accredited laboratory; the actual measurements are documented and maintained by the QMS Representative.
- 3.3.3 New PAS is verified using the certified artifact in accordance with the PAS Inspection Instruction referenced in Section 4 below.
- 3.3.4 Laser Tracker and CMM operators report PAS problems to the QA Director for resolution.

3.4 INTERNAL QUALITY AUDITS

- 3.4.1 The DPD processes are internally audited annually at a minimum. In addition to regularly scheduled internal audits, the Lead Internal Auditor or the QA Director may select certain activities for more frequent auditing as status and compliance history changes.
- 3.4.2 Suppliers using DPD are initially audited and approved by the SQA utilizing the Supplier DPD Audit Checklist referenced in Section 4 below. DPD approved suppliers are required to complete the audit checklist annually and are on-site audited on a 3 year cycle.
- 3.4.3 Internal audit and supplier DPD audit results are maintained by the QMS Representative and are available for review by authorized customer representatives.


3.5 PROBLEM REPORTING AND CORRECTIVE ACTION

- 3.5.1 Upon receipt of new digital data, the Data Administrator verifies the dataset integrity. The dataset is reviewed for the following:

- Error messages from the downloading process.
- Key characteristics.
- Functional tolerances and annotations.
- File consistency.
- Environmental compatibility.

The Program Manager, with input from the design department as appropriate, contacts the customer for resolution if issues are identified. Only when all issues are resolved, does the Data Administrator move the dataset to the V: drive.

- 3.5.2 Hardware problems, software problems, dataset problems found after release to V: drive and product deficiencies are reported, tracked and resolved in accordance with the Corrective and Preventive Action Procedure referenced in Section 4 below.

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3.6 PROCUREMENT CONTROL


- 3.6.1 DPD capable suppliers are identified on the Approved Supplier List. New suppliers are audited as described in 3.4.2 above prior to being considered for work using DPD.
- 3.6.2 DPD requirements are identified on the ROR and incorporated into the Purchase Order when datasets are provided for manufacturing, inspection or design.
- 3.6.3 When datasets need to be provided to the supplier, the ROR initiator informs the Program Manager who initiates a DTR and submits it to the Data Administrator. The Data Administrator sends the data per the DTR instructions and notifies the Program Manager of delivery.

3.7 CONTROL OF MEASURING EQUIPMENT

- 3.7.1 All equipment used for product acceptance inspection, including CMS and PCMS equipment and accessories, is calibrated annually by an ISO17025 accredited laboratory.
- 3.7.2 The calibration schedule and records are maintained by the QMS Representative in accordance with the Control of Inspection and Testing Equipment Procedure referenced in Section 4 below.
- 3.7.3 The QMS Representative maintains an inventory list of all Vioneering CMS equipment, accessories, measurement software and operating systems.

3.8 INSPECTION MEDIA

- 3.8.1 The specific stages of production to perform feature measurements and special process validation are planned in advance and are included in the Visual Manufacturing Plan as Inspection Operation Cards.
- 3.8.2 The QA Processor receives and reviews all new Inspection Job Folders. The SOW, Tool Order and Purchase Order are reviewed for QA requirements, and detailed inspection instructions are added to the Inspection Operation Cards. Print outs of the travelers are placed in the Inspection Job Folder.
- 3.8.3 The QA Processor opens a new TIR package for the job. A General Line-Up sheet is completed for CMS and PCMS inspection operations and attached to the traveler. The line-up describes the required surface and feature measurements and the dataset file name that includes the current revision level.
- 3.8.4 The Lead Inspector moves the current authority dataset from V: Manufacturing Release to the V: QC Folder. Laser trackers and CMM measurement software uses digital data in the native CAD system. No derivative datasets or translations are required.
- 3.8.5 Vioneering does not use methods other than dimensional measurement to validate product features. Plots and digital tooling are not used.

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3.9 DATA EXCHANGE METHODS

- 3.9.1 The IT Systems Administrator maintains an inventory list of all CAD/CAM equipment and software. Changes to DPD related hardware and software capabilities are planned in advance and supervised by the QA Director in order to ensure that training requirements are identified and provided and that customers are notified within 30 days.
- 3.9.2 Data Administrators ensure that Vioneering can receive, validate, transfer, file and document authority datasets without change to the data integrity. Problems or required upgrades are reported as described in Section 3.5 above.
- 3.9.3 Dataset derivatives that are translated from their native system are validated prior to release to V: using the following methods:
 - Visual review for corrupted file errors and obvious loss of content.
 - Overlay authority dataset and translation with different colors and review for missing or contradicting features.
 - Create a minimum of four XYZ points in the authority dataset and print out the values. Then review the same XYZ points in the translations for equal values.

3.10 TOOLING

- 3.10.1 Vioneering is a tooling manufacturer and does not manufacture end items using customer tooling and does not verify end items using digitally defined tooling, physical templates or plotted media.
- 3.10.2 Vioneering manufactured tooling is verified in accordance with customer requirements as described in Section 3.8 above and includes installation of the Enhanced Reference System and tooling ball requirements.

3.11 TRAINING AND PROCESS PERFORMER

- 3.11.1 The QA Director, Design Director and Program Management Director are the qualified DPD/MBD process trainers.
- 3.11.2 Job descriptions identify personnel with access to DPD systems and the training requirements for those functions. New hire DPD training is recorded on the DPD/MBD Training Checklist.
- 3.11.3 External and internal DPD training records are maintained by the HR Administrator in training binders and logged into employee training matrices.



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4.0 RELATED DOCUMENTS

- 4.1 VQA.DPD.01 – DPD Process Flow Diagram
- 4.2 VDE.DTR – Data Transmittal Request and Confirmation
- 4.3 VPM.DTF – Document Transmittal Form
- 4.4 VQA.PR.03 – Control of Engineering Documents and Data Procedure
- 4.5 VNC.PR.01 – Control of NC Programs Procedure
- 4.6 VQA.PR.12 – Inspection and Testing Procedure
- 4.7 QPQ.WI.09 – PAS Inspection Instructions
- 4.8 VQA.CMS – Coordinate Measuring Systems Inventory List
- 4.9 VQA.SAC.02 – Supplier DPD Audit Checklist
- 4.10 VQA.PR.02 – Corrective and Preventive Action Procedure
- 4.11 VQA.PR.09 – Control of Inspection and Testing Equipment Procedure
- 4.12 VQA.CMS – Vioneering CMS Inventory
- 4.13 D6-51991 – Quality Assurance Standard for Digital Product Definition at Boeing Suppliers

5.0 REVISION RECORD

Section	Description	Date	QA Approval
All	Original issue.	10/29/10	