



Supplier Quality Manual

DAVCO Technology is committed to providing our customers with the highest quality products at the best value. Total customer satisfaction is our top goal.

As a supplier to DAVCO Technology, your company is a critical link in the on-time, quality and value chain. This manual has been developed to allow our suppliers to understand DAVCO's expectations for quality and delivery. Further, it becomes part of the acceptance of any purchase order that may be issued.

DAVCO Technology has adopted the standard known as IATF 16949 as the basis for our quality management system. We strongly urge our suppliers to adopt this standard as well. As a minimum, we require third party registration to ISO:9001, a plan to become certified, or agree to bi-annual audits by DAVCO if deemed necessary.

The scope of this manual extends to suppliers of materials, components or services deemed "*mission critical*" by DAVCO Technology and those having a direct effect on our customers' satisfaction.

It is impossible to cover every conceivable situation with a blanket statement or definition. If a situation occurs that is not covered by this Supplier Manual, contact DAVCO directly for specific questions and situations.

We thank you for helping us continue to be the "Supplier of Choice" to our customers.

Laurie Beegle, President

Molly Stabnau, Purchasing Manager

Michael Dykstra, Quality Manager

Jeff Collier, Plant Manager

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Conformance to Specifications

DAVCO requires all supplied products and services to conform completely to all relevant specifications.

Typically, “relevant specifications” will mean the engineering drawings and specifications provided by DAVCO. However, in some cases, industry standards may dictate additional requirements or industry standard practices (spectrography, equipment calibration, etc.).

Any deviation from specifications requires written authorization from DAVCO prior to shipment from your facility.

On-Time Delivery

100% on-time delivery is required. “On-time” is defined by DAVCO as no more than one week early nor more than one week later than the date specified on the schedule provided by DAVCO.

Scheduled services must be completed by the date agreed.

In the event of a potential late delivery, please contact your DAVCO representative as soon as you are aware that a late delivery may be possible. This will allow DAVCO to adjust production schedules (where possible) in order to maintain the satisfaction of our customers.

Quality System

DAVCO requires our suppliers to obtain third party registration to the current version of ISO 9001 unless special conditions are agreed upon, and strongly encourages our suppliers to develop a quality system that meets the requirements of the current version of IATF 16949.

This manual, as well as the IATF 16949 specification, reference several documents as complements. These include an SPC manual, the Advanced Quality Planning and Control Plan manual, the Measurement Systems Analysis manual and the Production Part Approval Process manual.

These documents are available through the Automotive Industry Action Group (AIAG). Their web site address is <http://www.aiag.org>.

We urge our suppliers to obtain each of these for use in developing a robust quality system and in complying with our requirements.

Suppliers, or potential suppliers, whose Quality Management System is not currently third-party registered must:

- 1) Prepare a plan (including a timeline) for becoming registered within two years
- 2) Agree to allow DAVCO to perform on-site quality system audits at least annually.

Initial Sample Approval

For **new parts** and **changes to existing parts**, DAVCO requires the submission of initial samples through the Production Product Approval Process (PPAP).

DAVCO requires a Level 4 submission with the following documents required:

- 1) Complete dimensional and functional layout
- 2) Numbered/ballooned drawing. (**NOTE:** The drawing and dimensional/functional layout **MUST** be performed using DAVCO Technology's Engineering drawings.)
- 3) Material Certification(s)
- 4) Process Control Plan (AIAG format)
- 5) Part Submission Warrant (AIAG format)

Refer to the appendix for guidance in successfully submitting a PPAP package to DAVCO Technology.

Suppliers may use their own internal forms for the above or may download forms from the DAVCO Supplier Web Portal at www.DAVCO.com/supplier.

DAVCO's Quality Department will advise if additional documentation is required.

NOTE: The DAVCO Quality Department will not accept a submission for product which does not fully comply with all specifications. If measurements/characteristics/features are found that do not meet DAVCO's requirements you must:

- 1) Correct the items and submit, or
- 2) Contact the DAVCO Engineering Department to request changes to our engineering drawings or specifications.

For suppliers who may be unfamiliar with the PPAP process and documentation please contact the DAVCO Quality Department for training or guidance.

Corrective Action

If it is suspected that nonconforming product has been shipped to DAVCO, we require swift and effective action by our suppliers. There are numerous problem resolution and reporting methodologies including "8D" and "Five-Why". These are good tools; however, DAVCO does not mandate any specific format.

If a problem arises DAVCO *does* require the following actions:

- 1) **Containment.** Isolate ALL suspect material. This includes material in your facility, in transit, in our facility and beyond, if necessary. Contact DAVCO Quality or Purchasing immediately if you have any suspicion that nonconforming product may have been shipped to our facility.
- 2) **Root Cause Analysis.** Address the true cause of the issue and eliminate it. Do not merely address the symptoms.
- 3) **Corrective Action Implementation and Validation.** Implement the corrections identified during your problem analysis activity, then validate that these corrective actions are effective.
- 4) **Communication with DAVCO.** DAVCO requires initial contact within 24 hours of an incident defining containment activities as a minimum. Ideally, the entire case can be closed within two weeks. Complicated issues requiring additional time should be reviewed with the DAVCO Quality Department.
- 5) **Documentation.** Copies of the problem resolution / corrective action documentation are to be submitted to DAVCO Quality.
- 6) **Clearly mark subsequent corrected shipments.** Once a problem has been corrected or parts have been sorted each container, for a minimum of the next three shipments, must

be clearly marked as “Conforming”, “100% Sorted for__”, or “Certified”. We prefer a bright green label.

- 1) **Verification.** Depending on the severity of the issue, DAVCO may require on-site verification of the corrective action.

Special Characteristics

Statistical Process Control

DAVCO indicates some characteristics on engineering drawings with a diamond shaped symbol (\diamond) indicating that the specified feature is critical to the form, fit or function of our product. These characteristics require special treatment as you develop your process controls. As a minimum, characteristics so marked must be treated as follows:

- 1) Statistical data consisting of no less than 30 samples from a production run of no less than 300 pieces must be included with your PPAP submission.
 - a. The control chart must show that the feature is in statistical control
 - b. A minimum P_{PK} of 1.33 must be achieved
- 2) On-going SPC is strongly recommended. If SPC is not used, a suitable alternative should be indicated in the control plan. Typically, alternative methods would include increased sampling frequency using a statistically derived sample size.

NOTE: There may be limited cases where the above is not feasible. Please contact DAVCO's Quality Department if you believe this may be the case.

If a critical characteristic cannot achieve statistical control and/or a P_{PK} of 1.33, you must include 100% inspection of this characteristic in your process controls. Acceptability will be determined by DAVCO.

Measurement System Analysis

Any gauge used to determine conformance to DAVCO's specifications must:

- 1) Be calibrated (with the calibration standard traceable to NIST or another appropriate standards body).
- 2) Have the measurement uncertainty determined at a sensible frequency.

DAVCO Owned Tooling and Material

DAVCO requires that tooling paid for or provided by DAVCO ~~us~~ be clearly identified as to ownership.

Material (components, parts, etc.) provided by DAVCO for inclusion in an assembly must be maintained in such a manner as to prevent deterioration and damage.

In all cases, tooling or material that becomes unusable must be reported to DAVCO as soon as possible.

Please refer to **ISO-9001 section 8.5.3** and **IATF16949 section 8.5.3** for further information.

Specialized Service Requirements

Calibration Services

Suppliers of calibration services must conduct such calibrations in accordance with the most current standards for the item(s) being calibrated. All calibrations must be traceable to NIST masters. Unless otherwise specified, all suppliers of calibration services must be registered to ISO/IEC-17025.

Gauge blocks must be calibrated in accordance with ISO-10012 and ANSI Z540.3, or the most current industry accepted standards.

A Certificate of Calibration must be delivered to DAVCO with the device(s) being calibrated. Calibration Certifications must contain the following information:

- 1) A description of the item(s) being calibrated, including unique identifiers where applicable
- 2) Date calibration is performed
- 3) Due date for next calibration (DAVCO will provide calibration interval information)
- 4) Standard(s) to which item(s) are calibrated
- 5) "As found" calibration (deviation from expected nominal)
- 6) Where applicable, corrected calibration readings
- 7) Identification of calibration equipment with date of last calibration and due date of next calibration
- 8) Signature and/or other identifier of person certifying the calibration results.

Note: If the "as found" calibration is discovered to deviate significantly from the expected nominal or other expected results, we request urgent communication with the DAVCO Quality Department. This will allow us to quickly evaluate the possibility that nonconforming product could have been produced or shipped. If the equipment is unable to be calibrated to meet the expected results, the same urgent communication is requested.

Outside Laboratory/Test Services

Outside laboratories must be accredited by A2LA or a similar accreditation body.

Suppliers of outside laboratory services must provide a legible copy of all relevant Scopes of Accreditation to DAVCO each time they renew their accreditation.

An original laboratory report should be mailed or emailed to DAVCO as soon as it becomes available. An email or facsimile may be sent in the interim where information is needed quickly.

As a minimum, each laboratory report must contain the following information:

- 1) Report/test date and unique laboratory report number
- 2) Test specimen identification
- 3) Summary or reference to test procedures
- 4) A statement describing the specification to which the test specimen is being compared
- 5) Actual test results
- 6) Where applicable, a "Statement of Conformance"
- 7) Signature and title of appropriate supplier representative certifying the results.

Anodizing/Plating Services

Suppliers providing anodized finish or plating services must meet the following:

- 1) A copy of the latest relevant specifications must be on file at the location performing the anodizing operation
- 2) The supplier must have the capability to measure and accurately report on each required specification. (Use of an accredited outside testing laboratory is an acceptable alternative if results can be reported in a timely manner.)
- 3) Meet all requirements of each specification which may include:
 - Coating thickness
 - Corrosion resistance (e.g. salt spray, fog chamber, etc.)
 - Appearance (e.g. color, finish, etc.) where applicable.
- 4) Provide certification with each production lot stating that each lot conforms 100% to relevant specifications.
- 5) At least annually, provide DAVCO with a laboratory report, A2LA or similarly accredited, listing each specification, actual test results and a "Statement of Conformance."

Where coating thickness is a function of process controls (cycle times, solution concentrations, etc.) the appropriate use of Statistical Process Controls (SPC) is strongly advised. Copies of relevant control charts should be available to DAVCO upon request.

Other Services

If your particular product or service does not appear to have been addressed above, please contact DAVCO for advice on how to proceed. Maintaining open communication between our companies is the best way to achieve a mutually beneficial relationship.

Revision History

Table of Revisions		
Revision Date	Author	Change Description
02/12/2009	P. Hoffman	Released.
03/03/2009	P. Hoffman	Added section on SPC and MSA.
05/20/2009	P. Hoffman	Editorial changes per M. Bara, R. Hegde review.
02/05/2019	M. Dykstra	Editorial changes and updates

Appendix

Note: Forms found in this section may be used by DAVCO's suppliers, though we will accept your internal documents as long as they achieve the desired intent.

Many of these forms may be found in their original format at www.DAVCO.com/supplier.

8 steps to a successful PPAP submission

- 1) **Review drawings for issues and get them addressed up front.** When engineering drawings are provided, make it a practice to thoroughly review all specifications. If you do not believe you can meet the requirements, inform DAVCO immediately.
- 2) **Submit to a released copy of the DAVCO drawing.** If a released version of the DAVCO engineering drawing is not available, contact the DAVCO Quality Department for direction on how to proceed. Do not submit to advanced information.
- 3) **Submit to a ballooned drawing / numbered print.** All dimensions and notes must be numbered and referenced in the submission package.
- 4) **Complete a full sample inspection report.** The sample inspection report must address every note and dimension on the drawing. Include the target and tolerances for all dimensions. Show whether the inspection passes or fails on the inspection report. Make sure the report is signed and all fields are complete in the header section.
- 5) **Show ranges or multiple measurements for dimensions designated as such.** When the drawing calls for a dimension in two or more places (example R1.5 3x), the inspection results must show two or more measurements or list the highest and lowest measurement for the dimension as a range or if the results are the same for each dimension checked, simply state the number of places it was verified.
- 6) **Show qualified statements of conformity.** On notes where the inspection is more of an attribute check, such as with burrs or material conformance, the standard practice for notation of conformance will be: "Conforms per _____". The blank should be filled in with a qualifier such as visual inspection, an attribute gauge (gage xyz), or a material certification. Do not simply state "conforms" without identifying the method or tool used to determine conformance.
- 7) **Include all certifications and test results in the submission.** If material is specified on the drawing, the certification must be provided. If an ASTM or mil spec is shown on the drawing as part of the material specifications, then the material certification must show compliance to that specification. This holds true for finish certifications or test specifications. All documents must show compliance to the engineering drawing and all applicable specifications.
- 8) **Do not assume.** Do not assume that DAVCO will know that the DAVCO specification is equivalent to another. It is best to check and document the traceability of such items before the submission takes place. The DAVCO print requirements are the only criteria used when reviewing the submissions received. This will help ensure that your submission will comply, and that approval will be granted quickly.

PPAP Submission Requirements Checksheet

Supplier: _____ DAVCO Part Number: _____
 _____ DAVCO Revision Level: _____

Submission Level Requested

Level 1 Level 2 Level 3 Level 4 Level 5

	<i>Requirement</i>	<i>Req?</i>	<i>Observations</i>	<i>OK?</i>
1	Design Record			
2	Engineering Change Documents			
3	Customer Engineering Approval			
4	Design FMEA			
5	Process Flow Diagram			
6	Process FMEA			
7	Control Plan			
8	Measurement System Analysis Studies			
9	Dimensional Results			
10	Material, Performance Test Results			
11	Initial Process Studies			
12	Qualified Laboratory Documentation			
13	Appearance Approval Report			
14	Sample Product			
15	Master Sample			
16	Checking Aid			
17	Records of Compliance with Customer Specific Requirements			
18	Part Submission Warrant			

Quality Problem Report

QPR Page1

Discovered by: <input type="checkbox"/> Customer <input type="checkbox"/> Operator <input type="checkbox"/> QC <input type="checkbox"/> Other:	Customer:	
	Customer Contact:	
	Customer Phone:	
	Part Number:	

Problem Description	Date		By	
	Opened			
	Update			
	Update			
	Closed			

Team Members / Title or Position

_____	_____
_____	_____
_____	_____
_____	_____

Containment Information		Date	By
Internal			
In-transit			
At Supplier			
At Customer*			
Customer contact info:			

*If nonconforming product is suspected to be at a customer location contact the customer immediately.

Items Investigated / Actions Taken	R/C?	Date	By

(R/C= Root Cause. Possible answers: Y=Yes, N=No, C=Contributory)

QPR Page 2.

Root Cause

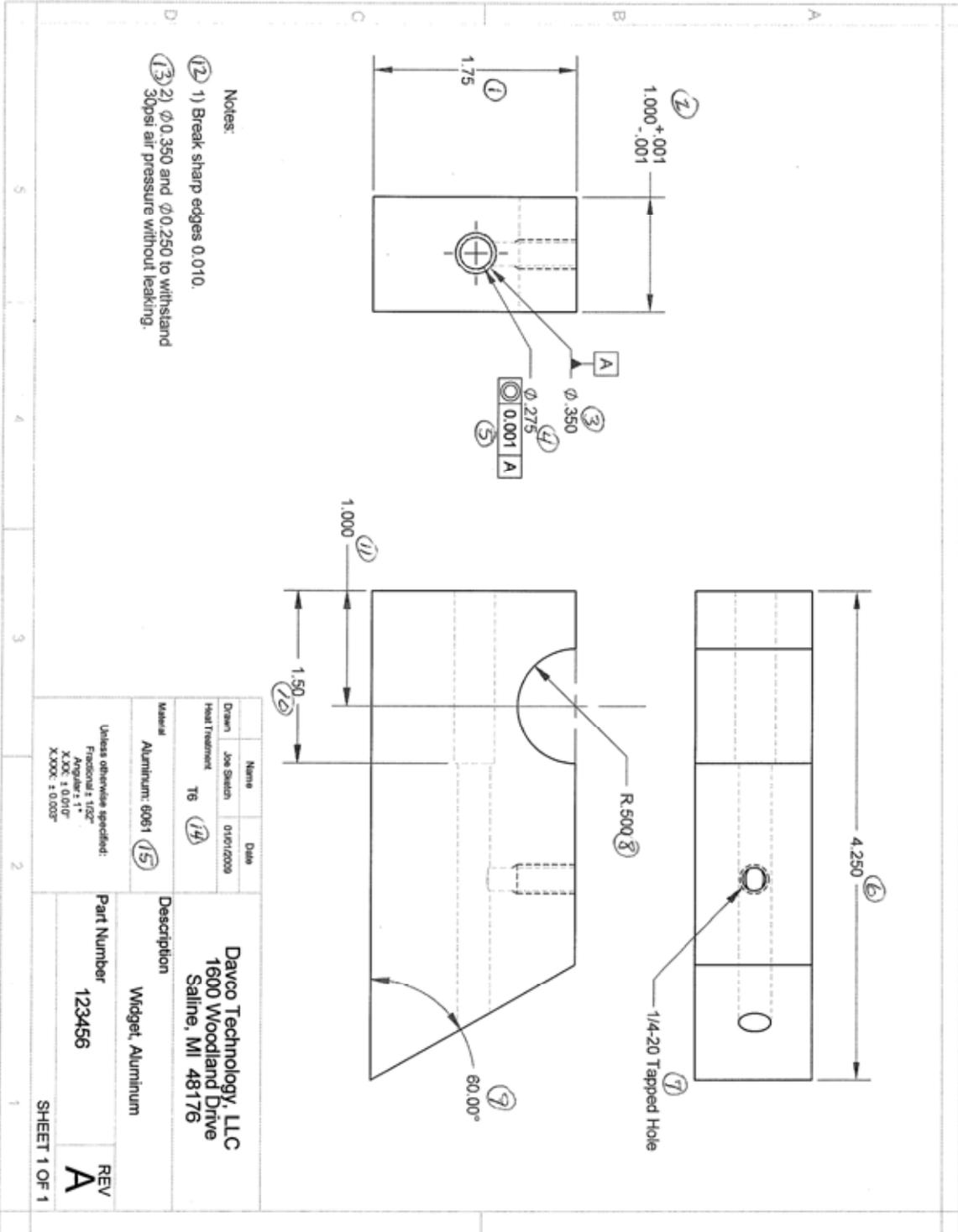
Corrective Action

Preventive Action

Verification

Additional Information / Comments / Observations : _____

Sample Numbered / Ballooned Drawing



Sample Control Plan

Prototype Pre-Launch Production

CONTROL PLAN

Control Plan Number			Key Contact/Phone					Date (Orig.)		Date (Rev.)		
Part Number/Latest Change Level			Core Team					Customer Engineering Approval/Date (If Req'd.)				
Part Name/Description			Supplier/Plant Approval/Date					Customer Quality Approval/Date (If Req'd.)				
Supplier/Plant		Supplier Code	Other Approval/Date (If Req'd.)					Other Approval/Date (If Req'd.)				
PART/ PROCESS NUMBER	PROCESS NAME/ OPERATION DESCRIPTION	MACHINE, DEVICE, JIG, TOOLS, FOR MFG.	CHARACTERISTICS			SPECIAL CHAR. CLASS	METHODS					REACTION PLAN
			NO.	PRODUCT	PROCESS		PRODUCT/PROCESS SPECIFICATION/ TOLERANCE	EVALUATION/ MEASUREMENT TECHNIQUE	SAMPLE		CONTROL METHOD	
									SIZE	FREQ.		
						<input type="checkbox"/>						

Revision History

Rev	Date	By	Detail

Supplier Request for Temporary Deviation from Specifications

Section CD

Supplier: Complete ALL fields in section 1 of this form. Submit to DAVCO Engineering Department.

Company Name

Date of Request

Requestor Name

Part Number

Requestor Phone/Email

Suspect Quantity

DAVCO Specification(s):

Actual:

Other Information: _____

Check here if additional sheet(s) attached.

Will a corrective action investigation be conducted with a copy sent to the DAVCO Quality Dept.?

Yes

No

Due Date: _____

Section @

DAVCO Engineering Department: Complete the fields in section 2 of this form. Return a copy to the supplier, send a copy to the DAVCO Quality Manager and file the original.

Deviation Request Disposition:

Approved

Denied

Other: _____

Disposition by (print): _

Title: _

Date: _

Signature: _

Rationale (Optional):

Check here if additional sheet(s) attached.