

Philway Products Inc

QUALITY MANUAL

(ICE-SP30-99 Uncontrolled Copy - To verify most current revision see last page)

It is the intent of this Quality Manual to meet the current revision requirements of MIL-PRF-31032 & ISO 9001:2008. It is a document that describes Quality Policies, the means to accomplish those policies, an overview of each aspect of the Quality System and reference to applicable Standard Procedures (SPs) & Work Instructions (WIs).

Philway Products Mission Statement

Philway Products is committed to providing the best possible quality in service and product. The Philway Products team understands that the Customer expects zero functional defects, responsive timely delivery and the lowest “total cost” possible. The entire Philway Products team shall remain focused on continually improving our capabilities through effective process controls and a philosophy of total employee quality involvement.

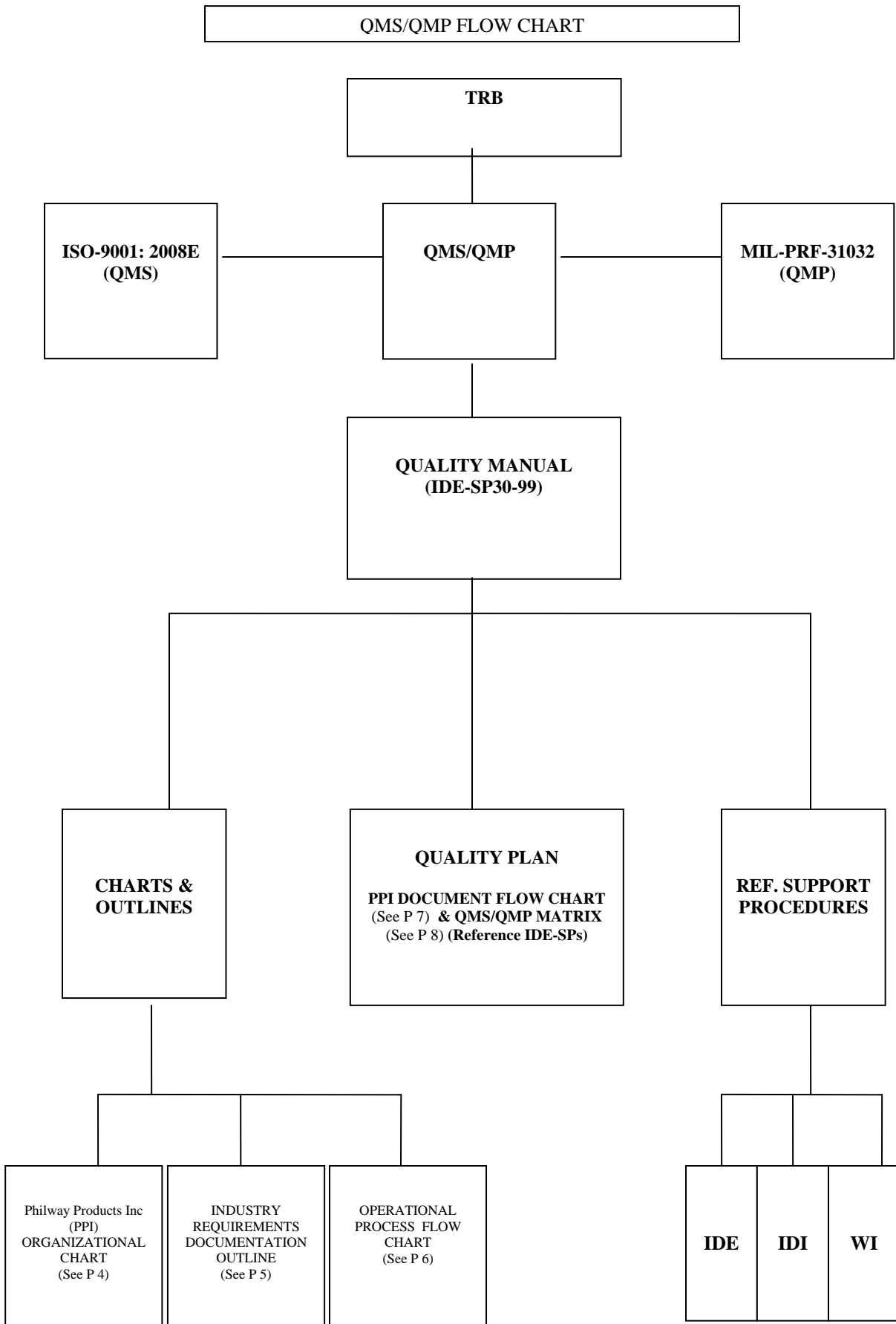
Quality Manual Revision Amendment Table

Doc Rev	Pages Affected	Reason For Change	Date
12	All	Changes to include QS-9000 requirements and updated org.chart	5/18/01
13	All	Revisions for QS-9000	6-13-01
14	8, 9, 19, 22,33,35,49	Revisions for QS-9000	6/27/01
14	NONE	Yearly Review	6/27/02
15	Updated Organizational Chart	Yearly Review	6/27/03
16	Updated Organizational Chart	Yearly Review	6/25/04
17	12 & 27	Control Plan update Contingency Plan update	2/10/05
18	All	Complete Rewrite for integration of MIL-PRF-31032 & ISO 9001:2008	5/15/06
19	Charts, Outline & Minor Corrections	Update Review	7/10/07
20	Minor Changes & Updates	Update Review	7/10/08
21	All	Manual re-issued as issue 1 against ISO 9001:2008 to remove all references to ISO 9001:2000	6/08/09

TRB MG Approved:	Date:
TRB TG Approved:	Date:
TRB S&A Approved:	Date:
Supervisor Approved:	Date:

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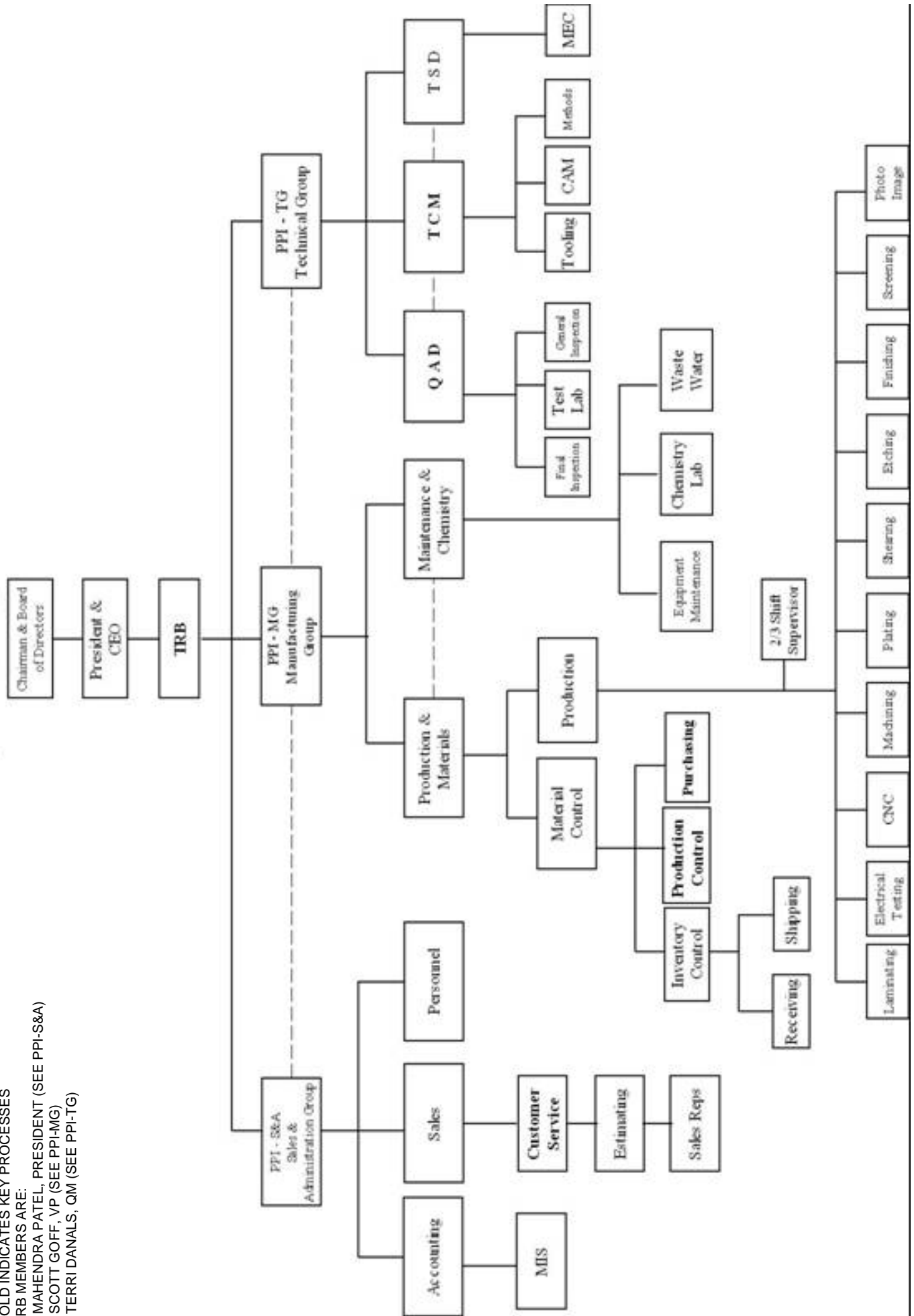
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DATE 6-8-09

BOLD INDICATES KEY PROCESSES
TRB MEMBERS ARE:
MAHENDRA PATEL, PRESIDENT (SEE PPI-S&A)
SCOTT GOFF, VP (SEE PPI-MG)
TERRI DANALS, QM (SEE PPI-TG)

Philway Products, Inc. Organizational Chart

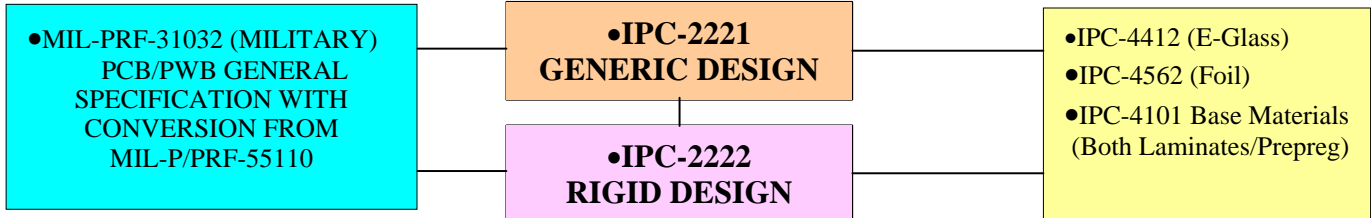


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INDUSTRY DOCUMENTATION REQUIREMENTS OUTLINE



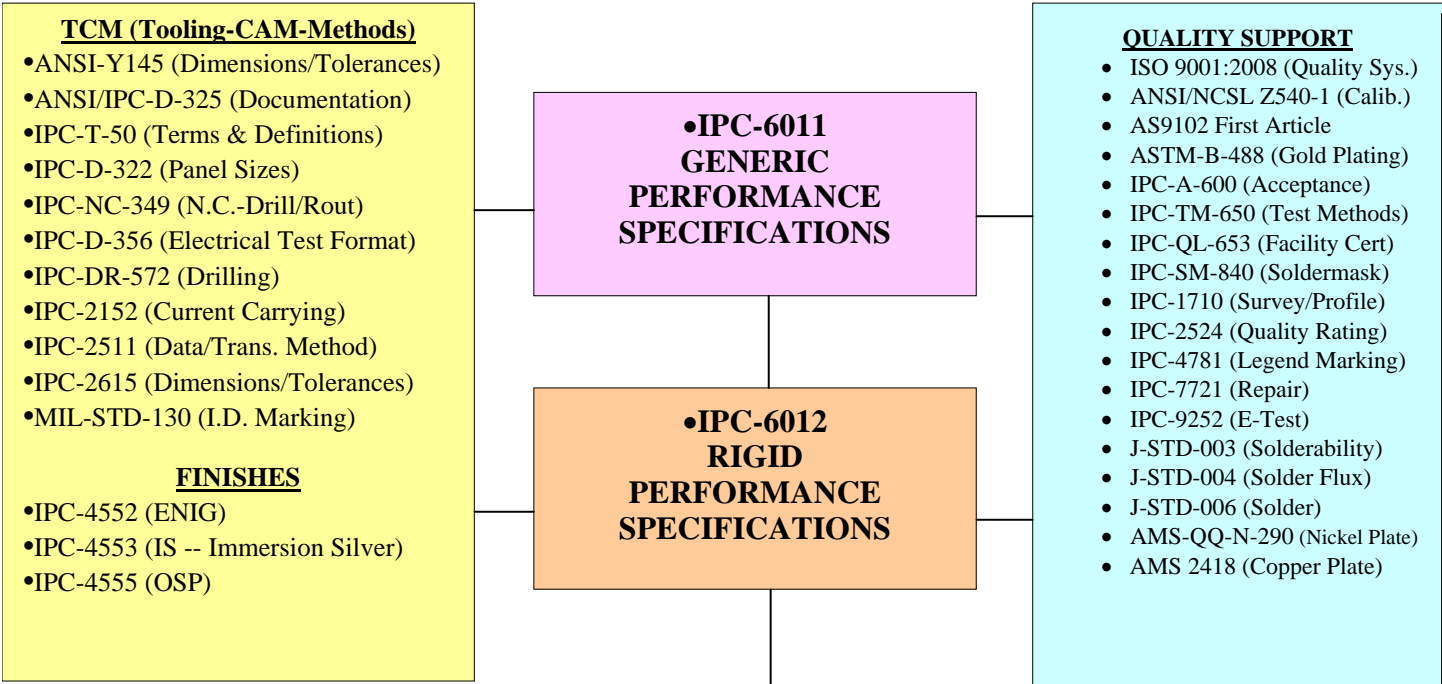
DESIGN LEVEL COMPLEXITY

A
GENERAL
(PREFERRED
PRODUCIBILITY)

B
MODERATE
(STANDARD
PRODUCIBILITY)

C
HIGH
(REDUCED
PRODUCIBILITY)

THIS IS THE WAY A PCB DESIGNER COMMUNICATES COMPLEXITY OF DESIGN TO A PCB MANUFACTURER. COMPLEXITY CAN APPLY VARIABLY TO ONE OR MORE FEATURES SUCH AS LAND REQUIREMENTS, MINIMUM HOLE LOCATION TOLERANCE OR CONDUCTOR WIDTH TOLERANCE, ETC. THEY SHOULD BE USED FOR ANY AND ALL CLOSELY CONTROLLED FEATURES. AN INCREASE IN COMPLEXITY GENERALLY TRANSLATES INTO AN INCREASE IN COST.



CLASS 1 (General/Standard)	CLASS 2 (High Performance/Extended Life)	CLASS 3 (High Reliability)	CLASS 3A (Military-Exceptions)
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Philway Supplemental Documentation: Quality Manual, Capabilities, Standard Procedures (IDE-SPNs) Data Exchange, Domestic Technology Roadmap, Electrical Test, Domestic Product Line, Panel Sizes, Certs (UL, CUL, Minority, IPC Member, Federal State Dept. (ITAR) and Defense Logistics (DOD) Registered, DSCC, ISO 9001:2000, RoHS)

Revised 2/5/08 -- For the most recent version of this document (and others listed above), please visit our website: www.philway.com •For current revisions of other documents, please visit the appropriate website.

Operational Process Flow Chart

This flow chart is not all inclusive in terms of all operations required to produce a Thru-Hole or Multi-Layer Printed Circuit Board (PCB). It is merely to serve as an educational aid in understanding some of the many processes required. The sequence of operations are general only, as some are interchangeable. There are no Special Processes in the production of a PCB that can not be verified by subsequent monitoring or measurement. Operations required for Heatsink or Blind/Buried Via PCBs are not shown

Pre-Production & Multi-Layer Process

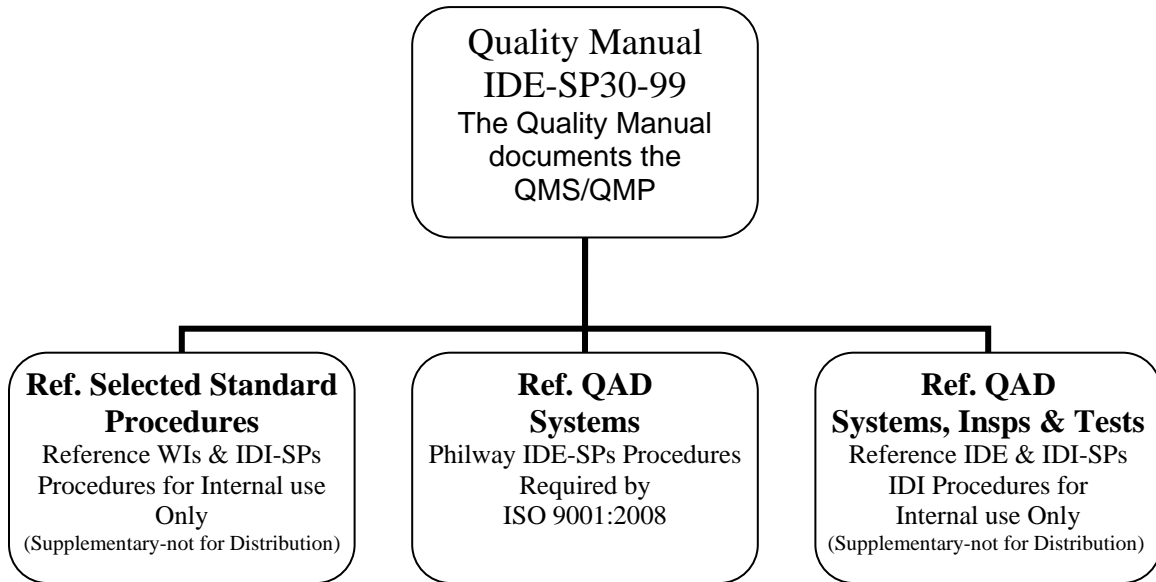
PCB Basic Thru-Hole Process

RFQs, Estimating & Quoting(CR Review) (10-14)	Receiving Laminate Inspection (19-01)
	*Shear (28-01)
Pre-Production	Drilling-Pinning Operation (28-04)
Contract Review & PO Entry (10-10)	*Thru-Hole CNC Drilling (18-01)
Production Control (Material & Ship Date Verification)	Wet Deburr Holes (15-07)
Production Control Computerized Scheduling (20-10)	*Electroless Panel Cu (15-04) (15-05 option)
	Photoresist Lamination (11-04)
TCM (Tooling/CAM/Methods)	*Photo Image Expose (11-05)
<i>Methods Conversion of Customer Requirements</i>	Photo Image Develop (11-07)
Resolution of Any Documentation or CAM DRC Issue (30-01, 19-15, 19-88, 19-90-in rewrite)	Production Inspection (11-08)
Production Photo Tooling (Conductor Pattern & LPI)	*Electroplate Pattern Cu/Sn (15-10) (15-09 option)
Drill Program/Check Piece (19-02)	Strip Photoresist (16-51)
Screen(s) for Legend (17-53)	*Etch (16-03)
Outline Tool/Check Piece (19-02)	*Strip Sn-Entire Board for Final Finish (16-01)
Electrical Test Program	Pumice Scrub (17-51)
Misc. Tooling & Fixtures	(Optional) Electroplate Tabs (Automatic) Ni-Au (15-14)
	<i>Ionic Contamination Test (24-07)</i>
	LPI Coat Auto (17-02) or Manual (17-03)
PCB Multi-Layer Operations	*LPI Expose (17-04)
(Registration & Production of Inner Layers)	LPI Develop (17-05)
Receiving Laminate Inspection (19-01)	LPI Inspect & Cure (17-11)
*Shear (28-01)	*Screen Thermal Legend (17-12)
Chemical Clean (11-99)	*Final Finish (Optional) as follows either: HASL (14-05 "H", 14-05-1 "V") or IS (15-01) or ENIG (15-02) or OSP (15-06) with <i>X-Ray Fluorescence-XRF (24-03)</i> for IS or ENIG
Photoresist Lamination (11-04)	
Pierce Locators (11-52) (in rewrite) or Drill Locators	*Outline=Routing (18-06) or Score / V-Groove (13-54)
*Photo Image Expose (11-05)	<i>Cross Section / Micro Section (24-08)</i>
Photo Image Develop (11-07)	<i>Solderability Test (24-09) COU PCBs</i>
Production Inspection (11-08)	<i>Rework Simulation Test (24-55) COU PCBs</i>
*Etch (16-03)	(Optional) Machining
Strip Photoresist (16-51)	Blow Dry (14-51)
*AOI Inspect Inner Layers (12-06)	* <i>Electrical Test (12-09)</i>
*Oxide Treatment (15-22)	<i>Solderability Test (24-09) NOC PCBs</i>
*Laminating (27-01)	* <i>Final Inspect LCI (12-08)</i>
Edge Flash Route (18-11)	*Pack & Ship (20-03)
Real Time X-Ray at Drill (18-07)	
Smear Removal or Etchback= (15-18 Permaganate, 15-19 Glass Etch, 15-23 Plasma Prebake &/or 15-24 Plasma)	<i>PCI Contract (Monthly) Inspection/Test (12-03)</i>
Post Smear Removal/Etchback Inspection	<i>CVI Contract (2-year) Inspection/Test (12-03)</i>

Italic indicates an IDE-SP, non-italic indicates an IDI-SP or WI

* Asterisk indicates JTS tracked operation

PPI Document Flow Chart



<i>Material Control & Pre-Production</i>	<i>QMS REFERENCE (not part of this document)</i>	<i>Systems & Pre-Production</i>
Purchasing System IDI-SP20-01	Quality Manual (this document)	Technical Review Board (Mgmt Resp) IDE-SP12-02
	Standard Procedure Format (Control of Documents) IDE-SP30-53	
Contract Review/PO Entry IDI-SP10-10	Record Control & Retention IDE-SP12-24	<i>In-Process Inspections & Tests</i>
RFQ, Estimating & Quoting (CR Review) IDI-SP10-14	Nonconforming Product IDE-SP12-11	AOI Insp. IDI-SP12-06
Conversion of Customer Requirements- IDI-SP30-01	Corrective Action IDE-SP12-98	Electrical Test IDI-SP12-09
Engineering Change Orders IDI-SP30-02	Preventive Action IDE-SP12-98	
CAD/CAM IDI-SP19-20	Audits (Internal & External) IDE-SP12-26	X-Ray Fluorescence (XRF) IDE-SP24-03
Non-CAD WI-19-15	Calibration System IDE-SP19-09	Ionic Contamination IDE-SP24-07
		Cross Section / Micro Section IDE-SP24-08
Packing & Shipping IDI-SP20-03	<i>Records Required on the above plus the following:</i>	Solderability Test IDE-SP24-09
	Management Review (see 5.6.1)	Rework Simulation Test IDE-SP24-55
	Education, Training, Skills & Experience (see 6.2.2e)	
	Realization processes & product meets CRs.(see 7.1d)	<i>Final Inspection</i>
	Results of CRs review & actions arising (see 7.2.2)	Final Inspection IDE-SP12-08
	Supplier evaluation results & actions arising (see 7.4.1)	
	Identification/Traceability (see 7.5.3)	<i>Contract (Outsourced) Insp/Test IDE-SP12-03</i>
	Customer Property (see 7.5.4)	

QMS/QMP MATRIX

Requirement/ Item Name (Note: May be abbreviated)	SUBJECT	PPI-SP	SP	MIL-PRF-31032		ISO 9001:2008	
		NUMBER	REV.	REF.	A-U	P & R Ref	R Only
MIL-QMP/ISO-QMS	Quality Manual (QMS Overview)	IDE-SP30-99	21			4	
Quality Manual	Quality Manual	IDE-SP30-99	21			4.2	
Documentation Procedure	Standard Procedure Format	IDE-SP30-53	K			4.2 & 4.2.3	
RFQ Quote & TCM	Quality Manual (Oper. Process Flow Chart)	IDE-SP30-99	21			7.2.2	
TRB System/ Management Responsibilities	Technical Review Board (TRB)	IDE-SP12-02	O	A.4.1	(A)	5	5.6.1
Process Flow	Quality Manual (Oper. Process Flow Chart)	IDE-SP30-99	21	A.4.2 6.4.22	(B)		
Process Flow Documentation Index	Quality Manual (This Document)	IDE-SP30-99	21	6.4.23	(C)		
Functional Organizational Chart	Quality Manual Organizational Chart	IDE-SP30-99	21	A.4.3	(D)		
Conversion of Customer Requirements	Conversion of Customer Requirements	IDI-SP30-01	R	A.4.4	(E)		
Self Validation -- Internal Audits	Audits	IDE-SP12-26	L				
	TRB Meetings	IDE-SP12-02	O	A.4.5	(F)	8.2.2	
QML Status Summary and TRB Reporting	Technical Review Board (TRB)	IDE-SP12-02	O	A.4.6	(G)		
Documentation/Data Retention, Storage and Disposition	Record Control and Retention	IDE-SP12-24	M	3.9	(H)	4.2.4	7.5.3
Continuous Improvement/PA	Corrective & Preventive Action (CA & PA)	IDE-SP12-98	L	A.4.7	(I)	8.5.3	
Failure Analysis/Non Conforming Product	Non-Conforming Product (Rejected materials)	IDE-SP12-11	L				
	Final Inspection CMR & RMA	IDE-SP12-08 IDI-SP12-16	T H				
	Corrective & Preventative Action (CA & PA)	IDE-SP12-98	L	A.4.8	(J)	8.3	
Process Control	Operational Flow Chart, SPs/WIs & TRB	IDE-SP12-02	O	A.4.9	(K)		
Corrective Action (CA)	Corrective & Preventative Action (CA & PA)	IDE-SP12-98	L	A.4.10	(L)	8.5.2	
Change Control	TRB & Tech. Roadmap	IDE-SP12-02	O	A.5	(M)		
List of Verification Test and Applicable Production Job Order (Traveler)					(N)		
1. Test Methods Performed at Our Plant	Final Inspection	IDE-SP12-08	T				8.2.4
2. Test Methods Performed at an Outside Facility	Contract (Outsourced) Inspection/Test	IDE-SP12-03	I				
Qualification Testing & Add- On Qualification	Qualification Testing & Add-On Qualification	IDE-SP12-02	O	A.4.11	(O)		
Periodic Conformance Inspection (PCI)	Contract (Outsourced) Inspection/Test	IDE-SP12-03	I	A.4.12	(P)		
Calibration	Calibration System	IDE-SP23-01	V	E.5.1	(Q)	7.6	
Training	Employee Training & Qualification	IDE-SP30-51	K	A.4.12	(R)	6.2.2	
Contract Services	Purchasing Instructions	IDI-SP20-01	H	A.4.14	(S)		
Test Optimization	Test Optimization	IDE-SP12-02	O	A.4.15	(T)		
Capability Verification Inspection (CVI)	Contract (Outsourced) Inspection/Test	IDE-SP12-03	I	A.4.16 & C.5	(U)		

Philway Products, Inc. (PPI) Quality Management System (QMS)

(Subtitles: QMS Overview or Quality Management Program-QMP)

Quality Policy: The Philway Products Mission Statement along with a commitment to Health, Safety & Environmental Responsibilities for PPI Employee's, form the basis for the Quality Policy. PPI will:

- Comply with all applicable statutory laws & regulations.**
- Follow a policy of continuous improvement, best use of management resources in all Quality matters & a business plans that considers Quality impacts.**
- Work closely with our Suppliers & Customers to establish high Quality Standards.**

The Mission Statement (PPI-MS) defines PPI objectives & commitment as to the quality of service and products we provide to our customers. It is reviewed periodically by the **Technical Review Board (TRB)** to determine if any changes are needed. The TRB is our internal Quality Management & Review Organization who is vested with total **Responsibility and Authority (R&A)** by the PPI Board of Directors (CBD) & the President/CEO to accomplish the PPI-MS. Each Employee who signs the Employee Training & Qualification Form indicates they have read and understand the PPI-MS. Any revised PPI-MS must be re-signed by each employee. Copies of the PPI-MS are displayed on the PPI notice boards.

The TRB also has R&A to establish, implement, monitor & change (as required) our Quality Plan. The TRB R&A also includes Quality Policy, Quality Planning & Continual Improvement plus duties required by Customer, DSCC & ISO specifications. They make periodic reports, including the resource needs for action implementation, to DSCC & to the CBD. The VP of Manufacturing and Technology is the Management Representative for external communications. As evidence of its R&A the TRB has established, documented, implemented & maintains a QMS which is outlined, defined and described in the PPI Quality Manual. The Quality Manual has one controlled copy each in printed and computer form.

The **Quality Manual** documents the QMS & has as its basis external requirements from Customers; Industry Specifications including: MIL-PRF-31032, MIL-PRF-55110, IPC-6011, IPC-6012, ISO-9001:2008 E Quality Management System Requirements (excluding Design & Development –section 7.3, Special Processes-section 7.5.2 & Customer Property-section 7.5.4-except for NDAs); and other sources.

Note: see **QMS/QMP Matrix** (integration of MIL-PRF-31032 & ISO-9001:2008) for details.
The Quality Manual also contains:

1. An **Organizational Chart** - shows diagram of this document.
2. An **Industry Documentation Requirements Outline** that is used in the conversion of CRs.
3. A **Document Flow Chart, QMS/QMP Flow Chart & Operational Process Flow Chart** which also make reference to PPI procedures of three types (see IDE-SP30-53):
 - A. **Interdepartmental (IDE-SPs)** are directly related to assuring that product meets Customer Requirements (CRs), typically fall within PPI-TG, affects more than one PPI department and/or contains requirements from (or ref. to) externally generated documents (OK for Eexternal use) which directly affects the **Key Processes** (in addition to **TRB**) as follows:
 - **TCM**- analyzes Customer Documentation Package, determines CRs related to the product, establishes Tooling, Computer Aided Manufacturing (CAM) & Methods of Manufacturing, and disseminates information to other applicable operations within PPI primarily through establishment of PJO (Shop Traveler) & Tooling Work Order. Confers with TRB as required.
 - **Production Control**- establishes schedules to assure delivery is met. Advises Customer Service when delays encountered.
 - **Purchasing**- upon advice from TCM & schedules from Production Control, orders laminate & prepreg plus other materials & supplies. They also order (as applicable) subcontracted production operations/processes & services.

- **QAD**- using Customer Documentation Package, Tests & Inspects to assure product meets all specified CRs.
- **Customer Service**- primary gatherer & disseminator of inputs from Customers (Customer Communications) on PPI PDQ performance (primarily through email & telecommunications). Advises Customers of order status as requested.

IDE's are updated on an "As Required Basis" with specific attention paid to changes (revision or replacement) of external requirements from Customers or Industry Specifications. Maximum period for review is not to exceed 3-years.

- B. **Intradepartmental (IDI-SPs)** PPI Proprietary and which are for Internal use only. While some are directly related to CRs, they are used primarily for non-production operations (processes) which do not relate to the determination of the acceptance of product to CRs & typically fall within the PPI-S&A or PPI-MG. These are typically updated on an "As Required Basis".
- C. **Work Instructions (WI)** PPI Proprietary and which are for internal use only. They are used primarily for production operations (processes) which do not relate to the determination of the acceptance of product to CRs & typically fall within the PPI-MG. These are updated on an "As Required Basis".

The **TRB** has R&A for the maintenance of all certified & qualified processes, process change control, reliability data analysis, failure analysis, Preventative Action (PA), Corrective Action (CA), QML PCB recall procedures, qualification status of the technology & Material Review Board (MRB). At least one member of the TRB is required for any of these actions.

All of the referenced documents may contain flow charts, additional reference documents and are measured, monitored and subject to periodic review for effectiveness, suitability & improvement. Records are maintained as required.

Those documents (including the Quality Manual) approved for external use (IDE-SPs) are indicated as such & may be posted on the PPI website. Those documents for internal use only (IDI-SPs & WIs) may only be posted on the PPI network.

(The following further describes Quality Policy, & Quality Objectives plus PPI Group Relationships)

Under the TRB are three interrelated groups containing various departments each with its own R&A. The **QAD** (Quality Assurance Department) is vested with R&A to assure only functionally acceptable product is shipped to Customers IAW their requirements & no functionally acceptable product is scrapped. The QAD has R&A to issue & disposition Return Material Authorizations (RMAs).

I. Relationship of QAD to the **Technical Group** (PPI-TG): QAD functions as part of the Technical Group, along with **TCM** (Tooling, CAM & Methods) and **TSD** (Technical Support Department). In the manufacture of Printed Circuit Boards (PCBs) quality acceptability is typically defined by Customer Requirements (CRs) and through the use of various documents (see Industry Documentation Requirements Outline).

NOTE: While TCM has primary R&A to take CRs, qualify them against PPI Capabilities and the Technology Roadmap, perform Design Rule Checks (DRCs), perform Manufacturability Checks and incorporate CRs into Tooling Shop Orders/Tools, Shop Travelers/Production Job Orders (PJOs), QAD has ultimate R&A to interpret and mandate that product shipped to Customers be in full compliance with the CRs, so long as those CRs are not in conflict with PPI document requirements, or governmental laws and regulations. The TRB has R&A to approve or disapprove any QAD, TCM or TSD related IDE-SP, IDI-SP or WI. In the event of conflict between QAD, TCM or TSD, the final R&A for disposition & resolution shall be the TRB. TSD has primary responsibility for Measuring Equipment Control (MEC).

II. Relationship of QAD to the **Manufacturing Group** (PPI-MG): The manufacture of PCBs involves the chain linking of various departmental production processes, sub-processes, operations and methods into the overall subtractive process required to produce a product that successfully:

- A. Carries current (without opens or shorts)
- B. Permits the mounting of components (acceptable solderability)
- C. Complies with dimensional requirements (fit & form).

The control of PCB quality involves the action of successfully joining five elements each under defined parameters or specified controlled conditions. Those elements are:

- 1. Work Instructions (WI)
- 2. Materials / Supplies (S)
- 3. Equipment (E)
- 4. Labor (L) or Human Resources (HR)
- 5. Work Environment (WE)

NOTE: Defects arise as the result of elemental conditions exceeding defined parameters or specified controlled conditions. While PPI-MG has R&A for this mission, QAD has R&A to monitor the overall process and stop work on any process, which due to its operation outside of defined parameters, may result in the production of functionally defective product. TRB has R&A to approve or disapprove any PPI-MG related IDE-SP, IDI-SP or WI. In the event of conflict between PPI-MG and QAD the final R&A for disposition and resolution shall be TRB. QAD may reject non-compliant/ defective WIP or Finished Goods product and disposition IAW IDE-SP12-11. While the R&A of materials / supplies along with outsourced goods and services is also under PPI-MG, QAD has R&A for the control of those suppliers by the authority to audit PPI PO documentation, reject non-conforming materials/goods/services (Receiving Inspection) & disapprove any supplier.

III. Relationship of QAD to the **Sales & Administrative Group** (PPI-S&A). PPI's Sales and Administrative Group involves activities related to Accounting, Sales Department / Customer Service and Personnel. Customer Service is the primary contact for our Customers so it is natural that issues involving Product Quality may first come through Customer Service. Customer Service must involve QAD through written or verbal communications, for any quality related issues. The preferred method for doing this is email with the subject containing (as applicable) Customer Name, Location, P/N, PO Number and Issue. The body of the email should advise action to be taken by QAD and if a reply is required, to whom that reply is to be made.

Estimating has preliminary R&A for reviewing CRs as furnished or referred to in Customer's Request For Quotations (RFQs), and factoring them into the quotations to the customers (or prospects) for the purpose of securing POs. QAD has R&A (upon request) to interpret & approve (or disapprove) said quotations & their terms. As a service to the Customer, Estimating may also generate panelizations which are part of the quotation. These panelizations must be approved by the Customer at time of order and become a permanent part of the CRs. TCM conducts final review of these CRs at the time of the order. Sales has prime responsibility to monitor Customer Satisfaction in regard to price (P), delivery (D) & quality (Q) issues. They should communicate on "P" issues within their department and on "D" issues with PPI-MG using email with same subject criteria as used to interface with QAD. All "Q" issues shall be immediately reported to QAD. TRB has R&A to approve or disapprove any PPI-S&A related IDE-SP, IDI-SP or WI. In the event of conflict between PPI-S&A and QAD the final R&A for disposition and resolution shall be TRB

NOTE: On **Customer Satisfaction**- given a stable marketplace customer satisfaction is directly linked to PPI's success in compliance with the PPI-MS. Customer satisfaction for "Q" will be measured by the quantity of quality issues in a given month, along with the quantity of RMA/credit memos issued for PPI responsible defective material dispositions, within a given month. Customer satisfaction for "D" will be measured by the quantity of "D" issues in given month along with the dollar amount of past due orders at the end of a given month. TRB shall act on Customer Satisfaction issues as is required.

The following is IAW ISO 9001:2008-12-15 (E) format with a brief descriptive & reference documents (as applicable). Whenever QMS is referred to it includes the requirements of QMP.

4.0	<i>Quality Management System</i>	<i>Reference Following</i>
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<i>4.1</i>	<i>General Requirements</i>	<i>Reference Quality Manual</i>
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Philway has established, documented, implemented & maintains a Quality Management System (QMS) IAW MIL-PRF-31032 & ISO- 9001:2008, with provisions for Continual Improvement (see 8.5.1). The details for the QMS are contained within & referenced to in this document.

<i>4.2</i>	<i>Documentation Requirements</i>	<i>Reference Quality Manual</i>
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QMS documentation includes a Quality Policy, Quality Objectives, this Quality Manual & all the procedures required by MIL-PRF-31032 & ISO 9001:2008, including PPI Standard Procedures (SPs) & Work Instructions (WIs) with supporting records (as required). The control of these SPs & WIs is detailed in IDE-SP30-53. Shop Travelers (PJOs) are maintained as production lot records by Production Control. QAD inspection/test records are maintained as are those for Estimating, Purchasing, TCM & Customer Service. The Control of Records is detailed in IDE-SP12-24.

5.0	<i>Management Responsibility</i>	<i>Reference Following</i>
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<i>5.1</i>	<i>Management Commitment</i>	<i>Reference Following</i>
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Top Management as members of the TRB have provided evidence of their commitment to the development & implementation of the QMS & its continued improvement by monthly & quarterly TRB meetings. They have communicated to our Company Employees, the importance of meeting Customer, Statutory & Regulatory requirements by establishing the PPI-MS, ensuring that Quality Objective are met, conducting Management Reviews & ensuring the Availability of Resources.

<i>5.2</i>	<i>Customer Focus</i>	<i>Reference Following</i>
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The TRB & the QMS ensures that Customer Requirements are determined & met with the objective of growing the Company by enhancing Customer Satisfaction.

<i>5.3</i>	<i>Quality Policy</i>	<i>Reference PPI-MS</i>
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The Philway Mission Statement (PPI-MS) defines & describes our commitment to Quality. As part of this Quality Manual, it is subject to review for suitability.

<i>5.4</i>	<i>Planning</i> <i>(Technical Review Board-TRB)</i>	<i>Reference Following</i>
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<i>5.4.1</i>	<i>Quality Objectives</i>	<i>Reference Quality Manual</i>
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The TRB & the QMS ensures that Quality Objectives are met, including those of specific Product Realization & those of a general sense as defined in the PPI-MS. Those Quality

Objectives could also be defined as having 100% Customer Satisfaction & so can be measured from the standpoint of Quality, Delivery & Service.

5.4.2	<i>Quality Management Systems Planning</i>	<i>Reference Quality Manual</i>
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The TRB ensures that the planning of the QMS is carried out to meet the requirements of MIL-PRF-31032 & ISO- 9001:2008 (see 4.1) & that the integrity of the QMS remain true to these documents in the event of planned & implemented changes to the QMS.

5.5	<i>Responsibility, Authority & Communications (Organizational Structure)</i>	<i>Reference Following</i>
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5.5.1	<i>Responsibility & Authority</i>	<i>Reference QMS Overview</i>
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The Philway Products Inc. (PPI) Quality Management System (QMS) defines & describes the pattern of Responsibilities & Authorities (R&A) and relationships that control how we perform our functions & govern how we react with one another. Our structure is shown on the PPI Organizational Chart.

5.5.2	<i>Management Representative</i>	<i>Reference Following</i>
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The VP of PPI-MG (Manufacturing Group) is the Management Representative for external communications. He also is responsible to ensure that processes needed for the QMS are established, implemented & maintained. As a TRB member he reports to the President on the performance of the QMS & the need for any improvement. He also ensures the promotion of awareness of CRs throughout the company (typically via email)

5.5.3	<i>Internal Communication</i>	<i>Reference Following</i>
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The TRB has monthly & quarterly meetings each with a different set of agenda topics. The topics discussed involve the effectiveness of the QMS. Actions taken as a result of these meetings are communicated within the organization, as Management Review Output.

5.6	<i>Management Review</i>	<i>Reference Following</i>
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5.6.1	<i>General</i>	<i>Reference Following</i>
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During the quarterly TRB meetings the QMS is reviewed for continued suitability, adequacy & effectiveness. This review includes assessing opportunities for improving & changes required to the QMS including Quality Policy & Objectives. Topics discussed during these meetings are recorded.

5.6.2	<i>Review Input</i>	<i>Reference Following</i>
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During the quarterly TRB meetings topics reviewed includes monthly meeting notes, results from audits, customer feedback, process performance & product conformity, status of corrective & preventive actions, follow-up actions, changes that could affect the QMS & recommendations for improvement. Topics discussed during these meetings are recorded.

5.6.3	<i>Review Output</i>	<i>Reference Following</i>
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During the quarterly TRB any decisions or actions related to improvement of the QMS & its processes, improvement of product related to CRs & resource needs are outputted to the appropriate departments or individuals. Topics discussed during these meetings are recorded.

6.0	<i>Resource Management</i>	<i>Reference Following</i>
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6.1	<i>Provision of Resources</i>	<i>Reference Following</i>
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The Management Representative monitors the QMS & during the TRB meetings he leads discussions regarding QMS effectiveness improvements & enhancements to Customer Satisfaction by meeting CRs

6.2	<i>Human Resources</i>	<i>Reference Following</i>
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6.2.1	<i>General</i>	<i>Reference Following</i>
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Employees performing work affecting product quality are judged competent on the basis of appropriate education, training, skills & experience.

6.2.2	<i>Competence, Awareness & Training</i>	<i>Reference Following</i>
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Management determines the necessary competence for employees performing work affecting product quality. Training is provided & performance in terms of generating defective product is monitored with disciplinary action taken, as required. Employees are made aware of the relevancy & importance of their activities & how they contribute to the achievement of quality objectives. The control of competence, awareness & training is detailed in IDE-SP30-51. Records are kept on Form 30-51A

6.3	<i>Infrastructure</i>	<i>Reference Following</i>
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During the quarterly TRB meetings the Infrastructure (building, workspace & associated utilities along with process equipment (hardware & software) & supporting services are reviewed for continued product conformity to CRs. This review includes maintenance, planning opportunities for improving & changes required to the Infrastructure. Changes affecting MIL-PRF-31032 certification shall be reported. Topics discussed during these meetings are recorded.

6.4	<i>Work Environment</i>	<i>Reference Following</i>
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The control of Work Environment (WE) is one of the five elements under defined parameters or specified controlled conditions. As required this element is addressed in SPs or WIs.

7.0	<i>Product Realization</i>	<i>Reference Following</i>
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7.1	<i>Planning of Product Realization</i>	<i>Reference Following</i>
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The QMS Overview describes the quality objectives & requirements for product along with the Key Processes. The Operational Process Flow Chart describes the operational sequence for producing a Printed Circuit Board (PCB) along with the associated procedures including those required for verification, validation, monitoring, inspection & test activities specific to the product. The criteria for product acceptance are CRs which generally includes those listed on the Industry Documentation Requirements Outline. The Board of Directors provides capital resources based on advise from the TRB (other resources are provided under TRB direction). Records are kept for Estimating, TCM & QAD (including Final Inspection) which along with email records are the most significant for product realization.

7.2	<i>Customer-related Processes</i>	<i>Reference Following</i>
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7.2.1	<i>Determination of Product Requirements</i>	<i>Reference IDI-SP30-01</i>
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TCM determines specific CRs at the time of order (see QMS Overview) including those for delivery. CRs involving post-delivery (Specification Requirements) are determined by QAD. The Management Representative, in conjunction with TRB, advises Estimating, TCM & QAD on requirements not stated by CRs but necessary for specified or intended use including those statutory, regulatory & any additional related to the product. Records are kept on all CRs.

7.2.2	<i>Review of Product Requirements</i>	<i>Reference IDI-SP10-14</i>
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Estimating conducts a review of CRs prior to our commitment to supply a product to the Customer. This typically takes place after an RFQ is received & before a quotation is generated. Using criteria established by internal documents, including the Technology Roadmap, CRs are defined, exceptions taken (as required) & defaults (as required) defined on the quote. When CRs are changed a revised quote is prepared. Records are kept on all RFQs, estimates & quotations. In the event of an order, these documents are made available to TCM, who then establishes a file folder containing records on each part number by Customer.

7.2.3	<i>Customer Communication</i>	<i>Reference Following</i>
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Product information is communicated by our website www.philway.com, for inquiries by Sales/Estimating, POs (original or amended) by TCM (all with QAD & Customer Service advice as requested). Customer Service is the primary contact for our Customers so it is natural that feedback (including Customer complaints) may first come through Customer Service.

7.3	<i>Design & Development</i>	<i>Exclusion</i>
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PPI does not do Design & Development (provided by Customers).

7.4	<i>Purchasing</i>	<i>Reference Following</i>
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7.4.1	<i>Purchasing Process</i>	<i>Reference Following</i>
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PPI ensures that purchased product conforms to specified purchase requirements by the use of POs to approved suppliers. PPI evaluates & selects suppliers based on the supplier's ability to supply product IAW requirements & specifications. The criteria for selection, evaluation & re-evaluation have been established along with record keeping requirements.

7.4.2	<i>Purchasing Information</i>	<i>Reference Following</i>
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The PPI PO shall describe the product or service to be purchased including (as appropriate) requirements for approval of product, procedures, processes & equipment, requirements for qualification of personnel & QMS requirements. The PPI PO shall be ensured for adequacy & accuracy before its issuance to the supplier.

7.4.3	<i>Verification of Purchased Product</i>	<i>Reference Following</i>
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PPI has established & implemented specific Receiving Inspection Procedures to ensure that certain purchased product (relating to product supplied to our Customers) meets specified requirements. We have no intent nor do we know of any of our Customers' intent to do source inspection, at our supplier, at this time (if required the PPI PO shall state so).

7.5	<i>Product & Service Provision</i>	<i>Reference Following</i>
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7.5.1	<i>Control of Production & Service Provision</i>	<i>Reference Following</i>
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PPI intends to plan & carry out production under controlled conditions which includes a website listed Technology Roadmap that describes the characteristics of the product, Work Instructions (WIs) for various production operations, the use of suitable equipment, the availability & use of monitoring & measuring equipment, the implementation of monitoring & measurement procedures & the implementation of release, delivery & post delivery activities.

7.5.2	<i>Validation of “Special Processes”</i>	<i>Exclusion</i>
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PPI does not have any processes where the resulting output cannot be verified by subsequent monitoring or measurement.

7.5.3	<i>Identification & Traceability</i>	<i>Reference Following</i>
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PPI identifies product IAW CRs & the appropriate reference specification (s) which includes a default category. We also identify product status IAW monitoring & measurement requirements. Product is broadly divided in those requiring & those not requiring coupons & microsectioning. Product is then subdivided into different specification requirements which are IPC or MIL related (see Documentation Requirements outline), each with its own Inspection/Test requirements. All products are identified by traceability marking of PPI & date code. Generally product requiring coupons & microsectioning is traceable to the product lot & panel it came from by serialization. Records IAW CRs are kept on all lots manufactured IAW IDE-SP12-24.

7.5.4	<i>Customer Property</i>	<i>Reference Following</i>
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PPI has no Customer Property other than Documentation (typically computer files), which is stored & maintained primarily for pre-order in the Sales Dept & post-order in TCM. As requested we typically agree to Non-Disclosure Agreements (NDAs) & in this event, controls are put in place via email. The Control of Records is detailed in IDE-SP12-24.

7.5.5	<i>Preservation of Product</i>	<i>Reference Following</i>
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PPI preserves the conformity of product during internal processing & delivery to the intended destination. This preservation includes identification, handling, packaging, storage & protection of the product & the product constituents such as coupons.

7.6	<i>Control of Measuring and Monitoring Equipment</i>	<i>Reference Following</i>
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PPI has determined the measure and monitoring to be undertaken & the measure and monitoring equipment and software. (M&TE) needed to provide evidence of conformity of product to CRs. The control of measuring and monitoring is based on ANSI/NCSL Z540 detailed, along with records maintained, in IDE-SP19-09 (Calibration System). Barco CAM Software is used for input & output of Gerber data (documentation) including DRCs but is not used for determining acceptability of product.

8.0	<i>Measurement, Analysis & Improvement</i>	<i>Reference Following</i>
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8.1	<i>General</i>	<i>Reference</i>
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PPI plans & implements the monitoring, measurement, analysis & improvement processes to demonstrate conformity of product, ensure conformity of the QMS & continually improve the effectiveness of the QMS by the result of actions from the TRB monthly & quarterly meetings.

8.2	<i>Monitoring & Measurement</i>	<i>Reference Following</i>
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8.2.1	<i>Customer Satisfaction</i>	<i>Reference Following</i>
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PPI monitors information relating to Customer perception as to whether PPI has met CRs (see QMS Overview note for details).

8.2.2	<i>Internal Audit</i>	<i>Reference Following</i>
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The TRB conducts Internal Audits quarterly to verify that the QMS conforms to the planned arrangements of Product Realization, ISO-9001:2008 & MIL-PRF-31032, & is effectively implemented & maintained. The Audit program reviews the “Key Processes” along with number of “General Items”. Members of the TRB do not review the areas that they have responsibility for. The Audit Program is detailed in IDE-SP12-26. Records are kept on Forms 12-26A. The TRB is detailed in IDE-SP12-02 with records kept on 12-02A & 12-02B. Corrective actions are taken as appropriate.

8.2.3	<i>Monitoring & Measurement of Processes</i>	<i>Reference Following</i>
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PPI has adopted & applies suitable methods for monitoring & measuring (where applicable) the QMS processes (inputs into outputs) which are described in this Quality Manual. When these planned results are not achieved, corrections & corrective actions are taken, as appropriate, to ensure conformity of product.

8.2.4	<i>Monitoring & Measurement of Product</i>	<i>Reference Following</i>
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PPI monitors & measures the characteristics the product to verify that the product requirements (CRs) have been met. This is primarily carried out by QAD at stages indicated on the Operational Process Flow Chart contained within this Quality Manual. Evidence of conformity with the acceptance criteria are maintained on various 12-08 forms. Shop Traveler (PJO) records indicate the person (s) authorizing the acceptance/release of product. Product release (the shipment of product to Customers) does not take place until QAD has determined that said products meets CRs or the Customer has granted a waiver.

8.3	<i>Control of Nonconforming Product</i>	<i>Reference Following</i>
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PPI ensures that product which does not conform to product requirements (CRs) is identified & controlled to prevent unintended use or delivery. PPI deals with nonconforming product with one of the following three ways: Rework &/or Repair (elimination of detected nonconformity includes re-verification to CRs), scrap, use as is / waiver (authorizing its use, release or acceptance under concession by a relevant authority). The procedure for Nonconforming Product is detailed in IDE-SP12-11, as is record keeping.

Taking action to preclude nonconforming products original intended use or application, is not an option as PPI does not design. For nonconforming product detected after delivery see Customer Return Processing (CMR & RMA) IDI-SP12-16.

8.4	<i>Analysis of Data</i>	<i>Reference Following</i>
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PPI determines, collects & analyses appropriate data to demonstrate the suitability & effectiveness of the QMS & evaluates where continual improvement of the effectiveness of the QMS can be made (this is done primarily at TRB meetings). This includes input data generated as a result of monitoring, measurement & other relevant sources such as Customers. The analysis of data provides information relating to Customer Satisfaction, conformity to product requirements (CRs), characteristics & trends of processes & products including opportunities for preventive action & suppliers.

8.5	<i>Improvement</i>	<i>Reference Following</i>
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8.5.1	<i>Continual Improvement</i>	<i>Reference Following</i>
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The TRB provisions for improving the QMS effectiveness are through the use of Quality Policy (see 5.3), Quality Objectives (see 5.4.1), Audit Results (see 8.2.2) , Analysis of Data (see 8.4), Corrective Action (see 8.5.2) Preventive Action (see 8.5.3) & Management Reviews (see 5.6).

8.5.2	<i>Corrective Action</i>	<i>Reference Following</i>
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PPI takes action to eliminate the causes of nonconformities in order to prevent reoccurrence. Corrective Actions are appropriate to the effects of the nonconformities encountered. The procedure for Corrective Action is detailed in IDE-SP12-98 as is record keeping.

8.5.3	<i>Preventive Action</i>	<i>Reference Following</i>
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PPI takes action to eliminate the causes of potential nonconformities in order to prevent occurrence. Preventive Actions are appropriate to the effects of the potential problems. The procedure for Preventive Action is detailed in IDE-SP12-98 as is record keeping

END

This Quality Manual has the approval of the TRB. Questions, objections, exceptions or comments regarding this document, along with inquiries (from holders of uncontrolled copies) as to current revision, should be directed to:

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