CQI-11

Special Process: Plating System Assessment

2nd Edition

Insight

Expertise

Results

The Catalyst for Peak Performance

AIAG
ABOUT AIAG

Purpose Statement
Founded in 1982, AIAG is a globally recognized organization where OEMs and suppliers unite to address and resolve issues affecting the worldwide automotive supply chain. AIAG’s goals are to reduce cost and complexity through collaboration; improve product quality, health, safety and the environment; and optimize speed to market throughout the supply chain.

AIAG Organization
AIAG is made up of a board of directors, an executive director, executives on loan from member companies, associate directors, a full-time staff, and volunteers serving on project teams. Directors, department managers, and program managers plan, direct and coordinate the association’s activities under the direction of the executive director.

AIAG Projects
Volunteer committees focus on business processes or supporting technologies and methodologies. They conduct research and develop, publish, and provide training on standards, conventions, standard business practices, white papers, and guidelines in the areas of automatic identification, CAD/CAM, EDI/electronic commerce, continuous quality improvement, health focus, materials and project management, occupational health & safety, returnable containers and packaging systems, transportation/customs and truck & heavy equipment.

AIAG PUBLICATIONS
An AIAG publication reflects a consensus of those substantially concerned with its scope and provisions. An AIAG publication is intended as a guide to aid the manufacturer, the consumer and the general public. The existence of an AIAG publication does not in any respect preclude anyone from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the publication.

CAUTIONARY NOTICE
AIAG publications are subject to periodic review and users are cautioned to obtain the latest editions.

MAINTENANCE PROCEDURE
Recognizing that this AIAG publication may not cover all circumstances, AIAG has established a maintenance procedure. Please refer to the Maintenance Request Form at the back of this document to submit a request.

Published by:
Automotive Industry Action Group
26200 Lahser Road, Suite 200
Southfield, Michigan 48033
Phone: (248) 358-3570 • Fax: (248) 358-3253

APPROVAL STATUS
The AIAG Quality Steering Committee and designated stakeholders approved this document for publication on February 7, 2012.

AIAG COPYRIGHT AND TRADEMARK NOTICE:
The contents of all published materials are copyrighted by the Automotive Industry Action Group unless otherwise indicated. Copyright is not claimed as to any part of an original work prepared by a U.S. or state government officer or employee as part of the person’s official duties. All rights are preserved by AIAG, and content may not be altered or disseminated, published, or transferred in part of such content. The information is not to be sold in part or whole to anyone within your organization or to another company. Copyright infringement is a violation of federal law subject to criminal and civil penalties. AIAG and the Automotive Industry Action Group are registered service marks of the Automotive Industry Action Group.

© 2012 Automotive Industry Action Group

ISBN#: 987 1605 3424 43-90000
CHANGES TO CQI-11 2nd EDITION

The Special Process: Plating System Assessment, 2nd edition contains new requirements, changed requirements, and clarifications that the supplier organization will need to consider in making its self-assessment. Below is a summary of the important changes in this 2nd edition.

1. Four new Process Tables have been added:
   - Table F Electropolishing and Chrome Flash
   - Table G Hard Chrome Plating
   - Table H Electroless Nickel
   - Table I Hydrogen Embrittlement Relief Bake Process

2. Section 6: “Hard Chrome Equipment” has been added.

3. The following sections contain the most significant updates or changes:
   - Cover Page: The following summary item has been added:
     - “Number of Process Table items not meeting minimum Requirements:”
   - Section 1: Special Process: Plating Process Assessment (General Facility Overview)
     - Question 1.9 Are records retained and available?
     All process control and testing records must be retained for a minimum of one calendar year after the year in which they were created.
   - Section 3 Zinc/Zinc Alloy Plating Equipment
     - Question 3.6 Is there a drying/curing system in place?
     Supplier shall have a defined drying process to adequately dry parts. Process to include control and verification of temperature and time.
   - Section 4 Decorative Plating Equipment
     - Question 4.6 For all thermocouples / thermometers, are they checked and/or replaced?
     Supplier shall have preventative maintenance system that is documented and implemented.
   - Section 7 Job Audit: New requirements that have been added include:
     - 7.8.8 Requirement: Hardness
     - 7.8.9 Requirement: Smoothness, Rz/Ra
     - 7.8.10 Requirement: Polishing/Grinding
     - 7.8.11 Requirement: Stress
     - 7.8.12 Requirement: Ductility
     - 7.8.13 Requirement: Pore Count/Active Sites
     - 7.8.14 Sulfur by foil
     - 7.8.15 Pull Test
- Process Tables: An asterisk (*) has been included in most Process Tables to indicate where justified variance from requirements are allowed.

- Process Tables A; B; C; D; E: have several changes including, but not limited to the “Monitoring Frequency” column.

- Process Table J Equipment: has updates to columns: “EQUIPMENT TYPE;” “Verification Frequency”; and “Calibration / Certification Frequency”.
FOREWORD

Automotive Industry Action Group (AIAG) committees are made up of volunteers from member companies in the automotive industry. The work of preparing process audits is done by AIAG technical committees. This 2nd edition is a collaborative work of OEM, Tier 1 suppliers, and plating suppliers. The main task of technical committees is to prepare Automotive Standards and System Requirements. Draft documents adopted by the technical committees are circulated to the Steering Committee for review and consensus approval. Publication of the documents requires approval by the Quality Steering Committee. The Quality Steering Committee would like to acknowledge and thank the following individuals and their companies who have contributed time and effort to the development of this document.

Acknowledgements

Chairperson: Ron Lash – Enthone Inc.
Jim Aide – Acadian Group
Richard Valice – Acument Global Technology
Brian Glowacki – Atotech
John Scharf – Atotech
Randy Solganik – City Plating
Mark Schario – Columbia Chemical
Michael Kelly – Coventya
Kim Tress – Chrysler LLC.
Jeff Szotek – Chrysler LLC.
JY Lee – Dipsol of America, Inc.
Dave Purcell – Fintex LLC.
Larry Xu – Ford Motor Company
Steven Kwong – General Motors Company
Elizabeth Hanna – Howard Finishing, LLC.
Harish Bhatt – Metalast
Craig Barboza – Modern Plating
Dennis Dumsha – Pavco
Karen Whitmore - AIAG

Supporting Members

Jeffrey Petkovich – Akebono USA
Tarek Nahlawi – Dipsol of America, Inc.
Murli Prasad - Dipsol of America, Inc.
Linda Wing – Enthone Inc.
John Szczypka – MacDermid
John Mulder – Master Finish Company
Gerardo Morales – Nicro S.A. de C.V.
Janet Robincheck – Toyota Motor Engineering & Manufacturing North America, Inc.
TABLE OF CONTENTS

ABOUT AIAG .......................................................................................................................................................... 1

FOREWORD ........................................................................................................................................................... 4

TABLE OF CONTENTS.............................................................................................................................................. 5

INTRODUCTION ..................................................................................................................................................... 6

GENERAL .................................................................................................................................................................. 6

PROCESS APPROACH .............................................................................................................................................. 6

PLATING SYSTEM ASSESSMENT GOALS .............................................................................................................. 6

ASSESSMENT PROCESS ........................................................................................................................................ 6

ASSESSOR QUALIFICATIONS ................................................................................................................................ 6

OTHER REQUIREMENTS ...................................................................................................................................... 7

1 SCOPE ................................................................................................................................................................. 8

1.1 GENERAL ........................................................................................................................................................ 8

1.2 APPLICATION .................................................................................................................................................... 8

2 THE PLATING SYSTEM ASSESSMENT PROCEDURE ..................................................................................... 11

3 SPECIAL PROCESS: PLATING ASSESSMENT ................................................................................................. 12

APPENDIX A – PROCESS TABLES.......................................................................................................................... 45

Process Table A: Zinc & Zinc Alloy Plating ........................................................................................................... 46
Process Table B: Mechanical Plating ....................................................................................................................... 54
Process Table C: Surface Conditioning of Metals for Decorative Plating or Electropolishing............................. 59
Process Table D: Surface Conditioning of Plastics for Decorative Plating ............................................................... 62
Process Table E: Decorative Plating for Metal and Plastics .................................................................................... 67
Process Table F: Electropolishing and/or Chrome Flash on Stainless Steel ............................................................. 72
Process Table G: Hard Chrome Plating ................................................................................................................... 74
Process Table H: Electroless Nickel ........................................................................................................................ 77
Process Table I: Hydrogen Embrittlement Relief Bake Process ............................................................................. 89
Process Table J: Process Control and Testing Equipment ........................................................................................ 91

GLOSSARY ............................................................................................................................................................ 95
INTRODUCTION

General
The work of preparing CQI-11: Special Process: Plating System Assessment (PSA), Second Edition was carried out through the AIAG Plating Work Group. These plating requirements are complementary to customer and product standards.

The PSA can be used to assess an organization’s ability to meet the requirements in this assessment, as well as customer, regulatory, and the organization’s own requirements. The PSA can also be used between an organization and its suppliers.

In the PSA, the word “shall” indicates a requirement for purposes of the self assessment. Failure to meet the requirements results in an assessment that is either “Not Satisfactory” or “Needs Immediate Action”. The word “should” indicates a recommendation. Where the term “such as” is used, any suggestions given are for guidance only.

Process Approach
The PSA supports the automotive process approach as described in ISO/TS 16949.

Plating System Assessment Goals
The goal of the PSA is the development of a plating management system that provides for continual improvement, emphasizing defect prevention and the reduction of variation and waste in the supply chain.

The PSA, coupled with an internationally recognized quality management system and applicable customer-specific requirements, defines the fundamental requirements for plating management systems.

The PSA is intended to provide a common approach to a plating management system for automotive production and service part organizations.

Assessment Process
Ongoing assessments shall be conducted annually, unless otherwise specified by the customer, to reexamine the continuing compliance with the PSA. Each assessment shall include a review of the organization’s systems using the PSA. Successive Job Audits (Section 7.0 of this document) shall sample parts from different automotive component manufacturers that require compliance to the PSA document.

The assessment shall use the process approach to auditing/assessing as identified by the requirements of ISO/TS 16949.

Assessor Qualifications
Assessor(s) shall have the following specific experience to conduct the PLATING SYSTEM ASSESSMENT:

1. Be an experienced quality management system (QMS) internal auditor (for example, ISO/TS 16949, ISO 9001)