

Training Catalogue

for

Electronics Assembly

and

Printed Circuit Board Fabrication

Order from:

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Training Catalog

for

Electronics Assembly

and

Printed Circuit Board Fabrication

Version 4.2

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Free Demos!

via the Web or CD-ROM / DVD-R

You can review the complete contents
of most IPC Training Products

using the

Free Online Reviews

in this catalog, or request

Free Demos on CD or DVD

from our easy online order form.

IPC is a not-for-profit organization
dedicated to printed circuit board fabrication
and electronics assembly.

All our training materials are developed and
approved by industry experts – to insure technical
accuracy – and are free of commercial bias.

IPC training programs have received over
35 industry Training/Communication awards
in the last five years.

Product Types in this Catalog

Video Tape

Ideal for Group Training Presentations. Most videos include Leader's Guide and Student Workbooks. Programs are designed for user-customization – to facilitate company-specific training.

DVD

With the added advantages of digital video (random-access and high-resolution), these products work well in group or individual training sessions. Most new DVDs come with English subtitles for the hearing-impaired and the English-as-a-Second-Language audience. Some DVDs are also available in dual-language versions (i.e., Chinese/English & Spanish/English narration audio tracks). Like Videos, all DVD programs come with a free review over the web.

OVT - Online Video Training / Digital Training Resources

Our Online Video Training (OVT) digital movie files give you the tools to provide 24/7 access to our award-winning training programs. Ideal for distance-learning programs, these digitized training videos can be mounted and downloaded, or played directly from any server -- across your network, or across the world via your intranet!

CD-ROM / CBT

Designed for self-paced learning. Includes: Computer-Based Training, Electronic Workmanship Standards, Electronic Reference. Some Electronic Reference programs allow the user to add or edit their own technical contents and images. CBT allows for automated training, testing and student record-keeping.

Desk Reference Manuals / Training & Reference Guides

Spiral-bound reference guides on Surface Mount & Through-Hole Solder Joint Acceptability, Component Identification, Wire Preparation & Crimping, and Introduction to Electronics Assembly. All Desk Reference Manuals are available for free preview by downloading a sample PDF file from the web. Links are provided in this catalog.

Wall Posters / Inspection Sheets

Make a "Big" impression with these 20 x 28 inch Surface Mount and Through-Hole Solder Joint Evaluation Posters. Contains all the major acceptance criteria from the IPC-A-610C and J-STD-001C for solder connections. Posters also come in 8.5 x 11 inch versions for personal use or inspection binders. Sample Posters / Inspection Sheets are available over the web in PDF format. Links are provided in this catalog.

Image Resources

Digital Clip Art on CD-ROM and 35 mm Slide Sets from a wide variety of close-up defect photography and 3D graphics. Give your own training materials more impact with these professional-quality visuals!

Any videotape (VT) program may be converted to DVD or OVT format upon request.

All IPC DVDs are in the DVD-R format.

Additional Training Resources

New Product Highlights

Review the latest training products – currently posted on the IPC website. Continually updated.

Training News

Sign up for automatic e-mail notification of new IPC training products. Fast and environmentally friendly!

Trainer Net

Receive information on IPC's peer networking forum - TrainerNet. Ask other technical instructors for ideas on how to most effectively educate your operators and inspectors. Post comments, or use this free resource to see what other trainers are doing.

Sample of Leader's Guides / Support Materials

The latest IPC videos, DVDs & CD-ROMs have their own web page that contains electronic files for all of the printed support materials – such as Leader's Guides, Student Workbooks, Course Outlines, Learning Objectives, Review Questions, Final Evaluation Tests, Scripts, etc – so you can modify the files for language translation and other user customization.

IPC-VT-53 or IPC-DVD-53**An Overview of Electronics Assembly – Video / DVD**

Produced for a non-technical audience (including sales, administrative, and management) to explain how component assembly fits into the global electronics industry. Begins with a basic overview of electronic components and printed circuit boards; then provides a visual tour of typical through-hole and surface mount assembly processes. Also describes the relationship of OEM's / EMS providers, including types of services, market sizes, and trends. An interesting and useful introduction to the electronics assembly industry - for employee orientation, colleges and technical / vocational schools.

(Winner of the *Vision, Telly* and *Aurora Gold Awards*.)

Available as VHS tape or DVD. Please specify by part number.

Time: 26 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-32**Introduction to Electronics Assembly – Video**

Designed by human resource managers . . . this video provides an introductory overview of basic assembly processes. Also describes how the assembly operation fits into the electronics industry and explains the history of through-hole and surface mount technologies. Covers the importance of communication with supervisors, continuous improvement, work attitude, teamwork, original equipment manufacturers/electronic manufacturing services industry relationships, and introduces personal safety, handling considerations and electrostatic discharge. Includes Leader's Guide and Student Workbook.

Time: 20 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-DVD-66C**The Seven Sins of Safety in Electronics Assembly with Training Certification – DVD**

A great follow-up to IPC's earlier safety training video, VT-11 (see below), this updated DVD is an excellent addition to your company's continuous improvement program. "Seven Sins" covers personal protection issues, improper use of tools, improper workstation design and set-up, hazardous materials, improper handling and positioning of materials, muscular-skeletal disorders and inadequate housekeeping. Workers aren't always aware that they're doing something wrong, until there's a consequence. This DVD is designed to eliminate bad habits – to prevent the Seven Sins of Safety from plaguing your workplace. DVD-66C can also be helpful for new hires – to provide a visual overview of potential hazards – and to help create safe work habits right from the start. Includes Leader's Guide, Learning Objectives, Review Questions and Final Exam. Certificates of completion are also included for students who pass the Training Certification test. Suitable for OSHA and ISO training requirements. Contains optional **English subtitles** for the hearing-impaired and ESL students. Time: 25 minutes. IPC Members: \$395 Nonmembers: \$495

[What Is Training Certification?](#)

IPC-VT-11 or IPC-DVD-11**General Safety in Electronic Assembly – Video / DVD**

An important introduction to operator safety in electronic assembly. Covers personal protective wear, including safety glasses, shoes, long hair, etc.; how to avoid personal injury from cuts and burns; prevention of "cumulative trauma disorders;" proper lifting technique; lead exposure and soldering fumes; an introduction to HazMat and MSDS; electrical safety, warning systems, and the importance of good housekeeping. Stresses the importance of operator knowledge and attitude to avoid personal injury. Includes Leader's Guide and Student Workbook. **Available as VHS tape or DVD. Please specify by part number.** Also available in Spanish on VHS tape only (part# VT-11-SP).

Time: 24 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-24 or IPC-DVD-24**Handling in Electronics Assembly – Video / DVD**

Explains the importance, benefits and proper technique for handling printed circuit boards, components, and electronic assemblies. Explores the typical causes of contamination and shows how fingerprints and oxidation can affect the formation of a good solder joint. Discusses flux residues, solvent extract tests, and dendritic growth. Also covers in-process storage and transport, along with basic principles of ESD prevention. Designed to provide an increased awareness about the "invisible" problems that can be caused by careless handling. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Time: 20 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Online Reviews](#)

[Free Demos](#)



IPC-VT-46 or IPC-DVD-46

Introduction to Mechanical Assembly of Electronics Hardware – Video / DVD

Begins with an overview of the assembly process to help provide context for understanding hardware buildup procedures. Provides a visual overview of the tools used in the mechanical assembly of electronics products, proper installation for hardware and fasteners, interconnection of electronic assemblies and mechanical construction of the cabinet. Also includes handling practices, personal safety and ergonomics. A great way to introduce new employees to the complexities of hardware buildup. Includes Leader’s Guide and Student workbook. **Available as VHS tape or DVD. Please specify by part number.** (Winner of the *Communicator* and *Vision Awards*.)

Time: 28 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-17 or IPC-DVD-17

Electrical Test for Assemblies – Video / DVD

Begins with a discussion of the importance of electrical testing; then provides a visual overview of a typical automatic tester. Explains the differences between in-circuit test, automatic functional test, functional bench test and final test. Details typical procedures for performing all aspects of in-circuit test and functional testing. Concludes with a discussion of reliability testing. Includes Leader’s Guide and Student Workbook. **Available as VHS tape or DVD. Please specify by part number.**

Time: 27 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-57

Stockroom Materials / Storage and Distribution– Video

Provides a visual overview of typical stockroom operations for through-hole and surface mount electronics assembly. Proper education, handling and storage procedures in the stockroom can save your company extensive rework. Three sections cover: 1. Incoming Inspection and Material Handling Procedures – including receiving procedures, material descriptions, inspection options for circuit boards, components, wire harnesses, and power supplies. Material handling considerations include oxidation, solderability, stacking problems, ESD protection, effects of scratches, damage from dropping. 2. Organization and Storage – proper storage of boards and components, markings, first in-first out, perishability, and inventory control. 3. Distribution – pick lists, kitting, scheduling, bar codes / check lists and return of excess materials. Includes Leaders Guide and Student Workbooks.

Time: 28 minutes. IPC Members \$300 Nonmembers \$400

IPC-DRM-53

Introduction to Electronics Assembly – Desk Reference Manual

A learning resource for new hires, operators, sales, purchasing, human resources, administrative personnel, students... and anyone interested in understanding the basic processes for both Through-Hole and Surface Mount Assembly. This new 32 page, full color, spiral bound Desk Reference Manual explains electronics assembly to the uninitiated. DRM-53 includes over 70 color photographs and graphic drawings to clearly define assembly technologies in easy to understand terms. Key terms are defined in a glossary – to help simplify industry lexicon. Each section includes references to additional training and industry specifications that can provide further information. Students can read at their own pace – study the terminology – and learn what everything looks like – all from one 5.5 x 8 inch spiral bound handbook.

Quantity	IPC Members	Nonmembers
1-9	\$25.00	\$50.00
10-24	\$18.75	\$37.50
25-49	\$15.75	\$31.50
50+	\$12.50	\$25.00

[Sample Download](#)
(0.7MB/PDF)

[Free Online Reviews](#)

[Free Demos](#)



IPC-VT-42/43C**Hand Soldering for Through-Hole Components with Training Certification - Video**

Now you can train and certify your hand soldering technicians. There's no better way to demonstrate, in microscopic detail, the essential theory of the hand soldering process. VT-42/43C will help your students better understand soldering fundamentals before they receive hands-on training. Objectives, Section Review Questions, and Certification Testing insure that all of your students demonstrate competency per ISO requirements. Also includes printable certificates for students with a passing grade. VT-42 visually demonstrates workstation practices, personal safety considerations, ESD prevention, soldering iron types, temperature selection, tip types and applications, heat transfer principles, how to avoid thermal damage, solder types / sizes and application, flux theory, low residue fluxes, and wetting principles. VT-43 covers hand soldering procedures for soldering through hole components onto printed circuit boards, tip tinning, tip / tool maintenance, reheating solder, heat sinks / thermal shunts, soldering thick boards, preheating, cleaning flux residues, and solder joint workmanship requirements from IPC-A-610C, including fillet shapes / contact angles, cold and disturbed solder, fractures, thermal damage, lifted lands, excessive solder, solder bridging, solder projections, solder balls, nonwetting, dewetting, blowholes, pinholes and product classes per J-STD-001C. Now includes optional **English subtitles** for the hearing-impaired and ESL students. *Winner of the AXIEM Silver Award.*

Also available in dual-language Chinese / English and Spanish / English DVDs, part numbers DVD-CH42/43C and DVD-SP42/43C, respectively.

Time: 40 minutes total, two videotapes. IPC Members: \$495 Nonmembers: \$795

[What Is Training Certification?](#)

IPC-DVD-42/43C**Hand Soldering for Through-Hole Components with Training Certification - DVD**

Now available on DVD, with (optional) **English subtitles** for the hearing-impaired and ESL students. Pretesting, Section Review Questions, and a Final Certification Test insure that your students understand and retain the required background knowledge before they begin hands-on training. DVD-42/43C explains proper workstation practices, personal safety considerations, ESD prevention, soldering iron types, temperature selection, tip types and applications, heat transfer principles, how to avoid thermal damage, solder types, sizes and applications, flux theory, low residue fluxes, wetting principles, soldering through-hole components onto printed circuit boards, tip tinning, tool maintenance, reheating solder, heat sinks / thermal shunts, soldering thick boards, preheating, cleaning flux residues and solder joint acceptance requirements from IPC-A-610C / J-STD-001C. Contains approximately 45 minutes of high resolution micro/action video and 3D animation, and includes a printable certificate for operators with a passing grade on the Training Certification Test. *Winner of the AXIEM Silver Award.*

Time: 40 minutes. IPC Members: \$495 Nonmembers: \$795

[What Is Training Certification?](#)

IPC-CD-42/43C**Hand Soldering for Through-Hole Components with Training Certification - CD-ROM**

This interactive training program allows students to learn soldering theory at their own pace... while automating evaluation and testing documentation per ISO requirements. Pretesting, Section Review Questions, and a Final Certification Test insure that your students understand and retain the required background knowledge before they begin hands-on training. CD-42/43C explains proper workstation practices, personal safety considerations, ESD prevention, soldering iron types, temperature selection, tip types and applications, heat transfer principles, how to avoid thermal damage, solder types, sizes and applications, flux theory, low residue fluxes, wetting principles, soldering through-hole components onto printed circuit boards, tip tinning, tool maintenance, reheating solder, heat sinks / thermal shunts, soldering thick boards, preheating, cleaning flux residues and solder joint acceptance requirements from IPC-A-610C / J-STD-001C. Contains approximately 45 minutes of micro/action video and 3D animation (from VT-42/43C), and includes a printable certificate for operators with a passing grade on the Training Certification Test. Approximately 90 minutes total training time. Stand-Alone version: unlimited users on a single computer in one facility. Also available as Site License at a single facility, for unlimited users simultaneously across a computer network (LAN).

[What Is Training Certification?](#)

Stand-Alone Version: (Train as many as you like - on one PC)

IPC Members: \$495 Nonmembers: \$795

Network Version: (Site license - for multiple computers at one facility)

IPC Members: \$1200 Nonmembers: \$1600

IPC-VT-49C**The Seven Sins of Hand Soldering with Training Certification - Video**

Now updated to include IPC Training Certification, VT-49C is designed to help prevent costly errors and unnecessary rework. The Seven Sins of Hand Soldering is the cure for improper soldering techniques that even the most experienced solder technicians succumb to: excess pressure, improper solder heat-bridge, wrong tip size, excessive temperature, improper use of flux, transfer soldering and unnecessary rework and repair. VT-49C exposes each of these sins - explaining how bad habits can create undesirable results - while clearly presenting the proper technique so the habit can be eliminated. This visual training tool can also be used proactively for new hires - to prevent bad habits before they start. If you're serious about quality, this video presentation will be the perfect addition to any company's continuous education / improvement program. Also useful for re-certification 6-12 months after initial VT-42/43C training. A must for effective and preventive ongoing training - to help resolve your most challenging hand soldering problems. Includes Leader's Guide, Student Workbook, written test, and printable certificates for students with a passing grade of 70% or higher. *Winner of the US International Film and Video Festival Award for Creative Excellence.* [What Is Training Certification?](#)

Time: 18 minutes. IPC Members: \$375 Nonmembers: \$575

[Free Online Reviews](#)

[Free Demos](#)

IPC-DVD-49C

The Seven Sins of Hand Soldering with Training Certification -- DVD

Now updated to include IPC Training Certification and reformatted for DVD with (optional) **English subtitles** for the hearing-impaired and ESL students. The Seven Sins of Hand Soldering is *the* cure for improper soldering techniques that even the most experienced solder technicians succumb to: excess pressure, improper solder heat-bridge, wrong tip size, excessive temperature, improper use of flux, transfer soldering and unnecessary rework and repair. DVD-49C exposes each of these sins - explaining how bad habits can create undesirable results - while clearly presenting the proper technique so the habit can be eliminated. This visual training tool can also be used proactively for new hires - to prevent bad habits before they start. If you're serious about quality, this video presentation will be the perfect addition to any company's continuous education / improvement program. Also useful for re-certification 6-12 months after initial VT-42/43C training. A must for effective and preventive ongoing training - to help resolve your most challenging hand soldering problems. Leader's Guide, Student Workbook, written test, and printable certificates for students with a passing grade of 70% or higher. *Winner of the US International Film and Video Festival Award for Creative Excellence.*

Time: 18 minutes. IPC Members: \$375 Nonmembers: \$575 [What Is Training Certification?](#)

IPC-CD-49C

The Seven Sins of Hand Soldering with Training Certification - CD-ROM

Now upgraded to include Training Certification, this interactive training CD-ROM is designed for experienced hand soldering operators who may have developed bad habits. Explores the crucial issues of: excess pressure, improper solder heat bridge, wrong tip size, excessive temperature, improper use of flux, transfer soldering and unnecessary rework or repair. CD-49C explains how bad techniques create undesirable results--while clearly presenting the proper methods so that the habit can be eliminated. Adapted from the IPC VT-49C video, this self-paced training program features full-motion video, optional pre-testing, chapter review questions, and a Final Certification Test--for comparison with pretest scores to gauge improvement. Administration module automatically records section completion and all test scores, giving you immediate, accurate documentation of employee competence. Includes a printable certificate for operators with a passing grade on the Training Certification Test. Designed to prevent costly errors and unnecessary rework, the interactive Seven Sins of Hand Soldering is the cure for improper soldering techniques. This visual training tool can also be used proactively--for new hires--to prevent bad habits before they start. If you're serious about quality, this new computer-based training will be the perfect addition to your company's continuing-education, or re-certification program. Stand-Alone version: unlimited users on a single computer in one facility. Also available as Site License at a single facility, for unlimited users simultaneously across a computer network (LAN). [What Is Training Certification?](#)

Stand-Alone Version: (Train as many as you like - on one PC)

IPC Members: \$375 Nonmembers: \$575

Network Version:(Site license - for multiple computers at one facility)

IPC Members: \$995 Nonmembers: \$1545

[Free Online Reviews](#)

IPC-VT-36

Hand Soldering With Low Residue Flux – Video

Explains what a low residue flux is and how it compares to other fluxes. Describes changes to the existing hand soldering process and covers hand soldering theory with low residue fluxes. Discusses visual inspection criteria for solder joints and flux residues, wetting considerations, and the importance of the solder heat bridge. Other topics covered are ideal solder feed rates and techniques, lower temperature soldering and the increased importance of tip maintenance. Soldering demonstrations include through-hole components, gull wings, J-Leads and turret terminals. This video can be used to train new hires or as a refresher for technicians who have been hand soldering for years. Also helps clarify the important reasons to modify existing hand soldering techniques. Includes a Leader's Guide and Student Workbook.

Time: 33 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-14

Hand Soldering For Terminals – Video

A visual explanation of tinning the soldering iron tip, stripping the insulated wire, tinning the wire and cleaning the iron tip. Demonstrates the proper method of attaching and soldering wires to turret terminals, cup terminals, bifurcated terminals, hook terminals, and pierced terminals. Discusses the importance of soldering for inspectability. Provides the criteria for recognizing the preferred solder joint, along with the minimum and maximum standards for acceptability. Includes Leader's Guide and Student Workbook.

Time: 25 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Demos](#)



Electronics Assembly Training - Component ID

IPC-VT-64C-K

Component Identification with Training Certification -- Video

Now you can train and certify your operators in through-hole and surface mount component identification. This two-part video begins by explaining the function of active and passive electronic components, reviews the basic through-hole and surface mount assembly processes, and covers component part numbers, bill of materials, component reference designators, markings, orientation, and polarity. VT-64C describes and illustrates all of the common through-hole and surface mount component types. Also briefly introduces resistor, capacitor, and inductor values and tolerances. The certification test includes 50 questions on through-hole and surface mount components and can be used by as many students as required within your facility. An IPC Training Certificate is included for issue to students scoring 70% and above on the certification test. The VT-64C training package also includes a Leader's Guide with course outline, learning objectives and chapter review questions to prepare students for the final test. Also includes one copy of DRM-18F -- Desk Reference Manual for Component ID. Time: 46 minutes total / 2 tapes. IPC Members: \$495 Nonmembers: \$595

[What Is Training Certification?](#)

IPC-DVD-64C-K

Component Identification with Training Certification -- DVD

IPC Component ID Training Certification is now available on the latest digital media -- with all the inherent benefits of DVD, including random access / chapter selection, optional navigation with visual training prompts, and higher resolution for improved detail. This DVD training program begins by explaining the function of active and passive electronic components, reviews the basic through-hole and surface mount assembly processes, and covers component part numbers, bill of materials, component reference designators, markings, orientation, and polarity. In addition, DVD-64C-K describes and illustrates all of the common through-hole and surface mount component types - including: through-hole resistors, capacitors, diodes, potentiometers, pin grid arrays, sockets, DIPs, SIPs, transistors, LEDs, inductors, chokes, torroids, filters, fuses and breakers, switches and relays, crystals, voltage regulators, thermistors, connectors, sockets, headers, and jumpers. Covers SMT component types (QFPs, PLCCs, rectangular chips, MELFs, SOICs, molded tantalum capacitors, SOTs, DPAKs), leadless components, and BGAs. Briefly introduces resistor, capacitor and inductor values and tolerances. Downloadable certification test includes 50 questions on through-hole and surface mount components -- usable by as many students as required within your facility. Download also includes an IPC Training Certificate for issue to students scoring 70% and above on the certification test, and explanatory Leaders Guide. DVD-64C-K includes a free copy of DRM-18F / Desk Reference Manual for Component Identification. Time: 46 minutes. IPC Members: \$495 Nonmembers: \$595

[What Is Training Certification?](#)

IPC-ER-18

Electronic Reference for Through-Hole and Surface Mount Component Identification -- CD ROM

IPC's widely-used Training and Reference Guide (AKA Desk Reference Manual) for Component Identification (DRM-18) has gone digital! ER-18, our new "Electronic Reference" and training tool contains many features not possible in the printed version. For instance, the ability to add your own company-specific text for any component and then update all user versions instantly! (Try that with paper.) The "Add Text" mode also allows for translation into any language supported by your Windows operating system. Add as many languages or as much company-specific text as you need. (Note: does not currently support IMEs, or "Input Method Editors.") You can even add your own custom photos or graphics to illustrate components or processes specific to your facility. ER-18 allows you to attach up to five of your own, company-specific images per every component page. An automated Color Band Calculator is also supplied, to help eliminate operator guesswork when determining resistor and inductor values. Simply select the appropriate color for every band and read the value in ohms or microhenries. The IPC Component ID Electronic Reference for surface mount and through-hole components is user-friendly. Our simple graphic interface makes it easy to find any component type -- even if English is not your primary language.

Stand-Alone Version: (Train as many as you like - on one PC)

IPC Members: \$350 Nonmembers: \$495

Network Version: (Site License - for multiple computers at one facility)

IPC Members: \$795 Nonmembers: \$995

IPC-DRM-18G

Component Identification - Training and Reference Guide

Assembly operators can now have a convenient component identification resource at their workstations - with the Component Identification Training and Reference Guide (formally known as 'Desk Reference Manual'). This comprehensive reference and training aid contains color photographs, computer graphics, schematic symbols and full descriptions of more than 40 of the most commonly used through-hole and surface mount components, interconnections and hardware used in electronic assembly today. Also included is a terminology section with quick facts on polarity, orientation, lead styles and Component Reference Designators (CRDs). The band reading section has full-color, easy-to-use color code charts and other component value data. Sixty-five pages.(Also see CD-A18F in Image Resources.)

Quantity:	IPC Members:	Nonmembers:
1-9	\$30	\$60
10-24	\$24	\$48
25-49	\$21	\$42
50+	\$18	\$36

[Sample Download](#)

(0.9MB/PDF)

[Free Online Reviews](#)

[Free Demos](#)



IPC-DVD-SMT-C-K

Surface Mount Solder Joint Workmanship Standards with Training Certification - DVD

Surface Mount Solder Joint Evaluation for Operators! Now you can train your operators and inspectors in the critical surface mount solder joint requirements from IPC-A-610C / J-STD-001C, using the latest DVD instructional technology. Group training takes advantage of the experience and expertise of your Class A instructor to interpret and assist students in applying industry criteria to company-specific needs. DVD-SMT-C can also be used as a stand-alone training program where students can select either Class 2 or 3 from the Main Menu, and study each requirement at their own pace. DVD-SMT-C uses 3D computer graphics / animations and microphotography to insure operator-level comprehension of the A-610 SMT acceptance criteria. Course contents include workmanship standards for Chip Components, J-Lead and Gull Wing solder joints as illustrated in the IPC DRM-SMT-C, Surface Mount Solder Joint Evaluation Desk Reference Manual (copy included free with purchase). The DVD-SMT-C program also includes a written test, along with printable certificates for students with passing grades. While this program does not certify your company to the entire IPC-A-610C Specification, it does provide IPC Training Certification to the specific A-610 criteria contained in this media-based training program. DVD-SMT-C also includes (optional) **English subtitles** for hearing-impaired and ESL students. This program is for unlimited students, making it an inexpensive and efficient method for training and verifying comprehension for ISO-9000 requirements.

Time: 27 minutes. IPC Members: \$495 Nonmembers: \$745 [What Is Training Certification?](#)

IPC-DRM-SMT-C

Surface Mount Solder Joint Evaluation - Desk Reference Manual

Tables and charts are fine for engineers but for the rest of us, a clear and simple explanation requires a picture. To help your workforce understand and apply the surface mount acceptance criteria from the IPC-A-610C and the J-STD-001C, IPC has produced a new 37 page, 5.5 x 8.5 inch, spiral bound Desk Reference Manual - to make it much easier for your inspectors and operators to make good decisions. DRM-SMT contains computer generated 3-D color illustrations for Chip component, Gull Wing and J-Lead solder joints. Each drawing clearly shows the minimum acceptable condition for each type of component misalignment, and the minimum solder joint sizes. All three classes of product are color coded to make it convenient to use as a reference guide. Also contains high quality color photographs of all of the major solder conditions, with the appropriate specification reference.

Quantity:	IPC Members:	Nonmembers:
1-9	\$30	\$60
10-24	\$24	\$48
25-49	\$21	\$42
50+	\$18	\$36

[Sample Download](#)
(1.4MB/PDF)

[Free Online Reviews](#)

IPC-DVD-PTH-CK

Plated-Through Hole Solder Joint Workmanship Standards with Training Certification - DVD

Now you can train and test your operators on the critical plated-through hole solder joint acceptance requirements from IPC-A-610C and J-STD-001C (for Class 2, Class 3 or both). Section one covers PTH Solder joint terminology, industry specifications for solder joint acceptance standards, product classes and process indicators. Section two details min/max acceptable dimensional and visual requirements for component side, barrel, and solder side. Section three explains visual defect criteria for solder balls, projections, bridging, webbing, voids, cold/disturbed joints, exposed basis metal, fractures, lead protrusion and flux residues. Written testing allows you to verify comprehension. Certificates for IPC Training Certification are included for students with passing grades. Course contents derived from DRM-40E, Through-Hole Solder Joint Evaluation Desk Reference Manual (copy included free with purchase). With (optional) **English subtitles** for hearing-impaired/ESL students, this DVD provides fast, effective and documented training/verification for ISO-9000 requirements. For unlimited students. Note: as per the DVD-SMT-C, this program is not a replacement for IPC-A-610C certification (see "What is Training Certification?" below). Time: 28 minutes. IPC Members: \$495 Nonmembers: \$745

[What Is Training Certification?](#)

[Free Demos](#)



Surface Mount Evaluation -Wall Posters & Inspection Sheets

What better way to demonstrate to your employees that "Inspection is Everyone's Job" than our new IPC Surface Mount Evaluation Wall Posters! Utilizing the graphics and acceptability criteria from the Desk Reference Manual (DRM-SMT), these 20 x 28 inch hanging posters serve as a constant reminder that quality is Job #1. Our 8.5 x 11 inch Inspection Sheets make a convenient reference guide for any employee to keep in their personal "Quality Control" binders. 20 x 28 inch Surface Mount Evaluation/Inspection Posters for Class 2 and Class 3 come laminated with eyelets for hanging. [Sample Image](#)

One **20 x 28** inch poster - each class - for Chips, Gulls and J-Leads.

IPC-P-SMTL-2 (Class 2, set of 3 posters)

IPC-P-SMTL-3 (Class 3, set of 3 posters)

IPC Members: \$100 Nonmembers: \$200

One **8.5 x 11** inch Evaluation/Inspection Sheet - each class - for Chips, Gulls and J-Leads.

Same content as posters. Laminated with 3-hole punch for binder.

IPC-P-SMTS-2 (Class 2, set of 3)

IPC-P-SMTS-3 (Class 3, set of 3)

IPC Members: \$25 Nonmembers: \$50

Quantity discounts (Inspection sheets only):

10 or more sets - less 10% - \$22.50 IPC Members / \$45.00 Nonmembers

25 or more sets - less 25% - \$18.75 IPC Members / \$37.50 Nonmembers

50 or more sets - less 50% - \$12.50 IPC Members / \$25.00 Nonmembers

IPC-DRM-40E

Through-Hole Solder Joint Evaluation -- Desk Reference Manual

The IPC Desk Reference Manual for Through-Hole Solder Joint Evaluation has undergone a major revision. The new DRM-40E now includes computer-generated 3D graphics, as well as close-up photography, to help users understand the complex requirements in IPC-A-610C and IPC/EIA J-STD-001C. Still only 30-pages, this 5.5 x 8.5 inch, full-color, spiral-bound Desk Reference Manual provides additional illustrations of component, barrel, and solder-side coverage per requirements in the standards. Document organization and format have been completely revised to facilitate utility and convenience. The popularity of the "DRM" series is based on their easy-to-use format, detailed illustrations, and clear language -- all within one multipurpose reference manual. DRM-40E covers solder fillet, contact angle, wetting, vertical fill, land coverage, and numerous defect conditions, for Class 1, 2 and 3 solder joints. Also includes a Terminology section. Your operators and inspectors now have a quick reference guide to see exactly what makes a proper through-hole solder joint!

Quantity:	IPC Members:	Nonmembers:
1-9	\$30	\$60
10-24	\$24	\$48
25-49	\$21	\$42
50+	\$18	\$36

[Sample Download](#)
(0.6MB/PDF)

IPC-EWS-610

Electronic Workmanship Standards for Surface Mount AND Through-Hole Solder Joints - CD-ROM EWS-610 demonstrates the critical acceptance criteria from the IPC-A-610C & IPC/EIA J-STD-001C industry standards for both surface mount and through-hole solder connections. Developed from the popular Desk Reference Manuals on Surface Mount and Through-Hole Solder Joint Evaluation (DRM-SMT-C and DRM-40E) this digital reference guide provides instant access to surface mount and through-hole solder joint acceptance criteria for electronic assemblies. EWS-610 guides your operators and inspectors through the necessary steps required to make an intelligent accept / reject decision. Using computer-generated animations and close-up defect photography, this PC-based program graphically demonstrates component alignment and solder joint defect criteria without relying on technical jargon. A "Text Edit" function allows for user-customization and language translation of solder joint acceptability criteria. Add as much company-specific text as you need, in as many languages supported by your WinOS! Allows you to customize your acceptance criteria with notes, references, and translations of company-specific information – and make that information available across your computer network. (Note: Text Edit function will not support IMEs, or Input Method Editors.) Can also be used to train operators in recognizing solder defects. A photographic "Defect ID" section for major component types identifies typical solder joint defects and process indicators. The "Terminology" section explains key vocabulary related to solder joint technology – to better understand the industry definition of crucial words and phrases. Key references from the IPC-A-610 and J-STD-001 are also included for every criteria and defect screen.

Stand-Alone Version: (Train as many as you like - on one PC)

IPC Members: \$350 Nonmembers: \$495

Network Version: (Site license - for multiple computers at one facility)

IPC Members: \$759 Nonmembers: \$1295

IPC-VT-610C-CERT

IPC-A-610 Worker Proficiency Certification / Training - Video

IPC-A-610 Class A Certified Instructors can now teach the latest surface mount and through-hole requirements from the new IPC-A-610 Rev. C – with help from two new IPC training videos. This two-video set reviews the IPC-A-610C scope and purpose and highlights key solder fillet dimensional criteria from sections 6 (Soldering) and Section 12 (Surface Mount Assemblies) of the Worker Proficiency Training Course. Video simplifies instruction and solves many practical problems, such as when an operator is forced to miss a portion of the training. The tapes are also an excellent way for students to reinforce what they learned in class prior to taking the open and closed book examinations. Includes additional photos, video and animation to illustrate important concepts. Brings a new alternative medium to classroom lecture and slides, which improves students' interest and retention. (Intended to supplement the IPC-A-610 Class A Instructor training course.) Presented by Tom Parkinson of WinTronics Inc., Sharon PA. an experienced IPC-A-610 Class A Instructor. *Winner of the Axiem Silver Award.* Time: 90 Min. Two videotapes.

IPC Members \$395 Nonmembers \$495

Through-Hole Evaluation - Wall Posters & Inspection Sheets

Full-color 20x28 inch laminated posters visually define minimum / maximum through-hole solder joint acceptability requirements to IPC-A-610C in high quality 3-D graphics. These posters depict complex through-hole solder joint requirements so clearly that all operators and inspectors can easily understand and apply the criteria. Bring technically accurate, industry consensus acceptability standards to your training room or inspection area. IPC through-hole posters come with corner eyelets for easy hanging, and are also available in a reduced size to fit into 3-ring binders, or for posting near each inspector. These "inspection sheets" measure 8.5 x 11 inch and are also full-color and fully laminated.

[Sample Image](#)

Size	Order #		IPC Members	Nonmembers
20" x 28"	IPC-PTHL-2	Class 2 Poster	\$50	\$75
20" x 28"	IPC-PTHL-3	Class 3 Poster	\$50	\$75
8.5" x 11"	IPC-PTHS-2	Class 2 Insp. Sheet	\$7.50	\$10
8.5" x 11"	IPC-PTHS-3	Class 3 Insp. Sheet	\$7.50	\$10

Quantity discounts (Inspection sheets only):

10 or more sets - less 10% - \$6.75 IPC Members / \$9.00 Nonmembers

25 or more sets - less 25% - \$5.60 IPC Members / \$7.50 Nonmembers

50 or more sets - less 50% - \$3.75 IPC Members / \$5.00 Nonmembers

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[Free Demos](#)

IPC-VT-54C**Electrostatic Discharge (ESD) Control with Training Certification - Video**

Clearly explains all the necessary information your operators need to understand in order to control charge build-ups and prevent costly damage to electronic components and assemblies. Now updated to include IPC Training Certification. Covers: the physics of static electricity, how static charges damage components, grounding, wrist straps / shoe grounding / testing, safe clothing, conductive smocks, ESD-safe work areas, elimination of static generating materials, controlling charge build-ups, activities that create static electricity, and proper handling / storage / transportation of ESD sensitive devices. Award winning introduction to ESD control, produced in cooperation with the ESD Association. Includes ESDA 2020 Specification, Leaders Guide with Course Outline / Learning Objectives, written Training Certification Test and color certificates for students with passing grades.

Time: 25 Minutes. IPC Members: \$450 Nonmembers: \$600 [What Is Training Certification?](#)

IPC-DVD-54C**Electrostatic Discharge (ESD) Control with Training Certification- DVD**

Updated to DVD - with (optional) **English subtitles** for the hearing-impaired and ESL employees, DVD-54C clearly explains all the critical information your operators need to understand in order to control charge build-ups and prevent costly damage to electronic components and assemblies. Covers: the physics of static electricity, how static charges damage components, grounding, wrist straps / shoe grounding / testing, safe clothing, conductive smocks, ESD-safe work areas, elimination of static generating materials, controlling charge build-ups, activities that create static electricity, and proper handling / storage / transportation of ESD sensitive devices. Award winning introduction to ESD control, produced in cooperation with the ESD Association. Includes Leaders Guide with Course Outline, Learning Objectives, written Training Certification Test and color / reusable Certificates for students with passing grades.

Time: 25 Minutes. IPC Members: \$450 Nonmembers: \$600

[What Is Training Certification?](#)

IPC-CD-54C**Electrostatic Discharge (ESD) Control with Training Certification - CD-ROM**

Clearly explains all the necessary information your operators need to understand in order to control charge build-ups and prevent costly damage to electronic components and assemblies. Now updated to include IPC Training Certification. This interactive training program covers: the physics of static electricity, how static charges damage components, grounding, wrist straps / shoe grounding / testing, safe clothing, conductive smocks, ESD-safe work areas, elimination of static generating materials, controlling charge build-ups, activities that create static electricity, and proper handling / storage / transportation of ESD sensitive devices. Award-winning introduction to ESD control, produced in cooperation with the ESD Association, CD-42/43C provides you with automated testing and record keeping. Includes User's Guide with Course Outline / Learning Objectives, written Training Certification Test and color certificates for students with passing grades. [What Is Training Certification?](#)

Stand-Alone Version:

(Train as many as you like - on one PC)

IPC Members: \$495 Nonmembers: \$745

Network Version:

(Site license - for multiple computers at one facility)

IPC Members: \$1195 Nonmembers: \$1745

IPC-DVD-78C**Seven Sins of ESD Control with Training Certification - DVD**

Designed as continuing ESD education / recertification for electronics assembly operators -- to reinforce best-industry practices, and help eliminate scrap caused by ESD damage -- DVD-78C includes (optional) **English subtitles** for the hearing-impaired and ESL students. Provides an entertaining visual analysis of the seven universal ESD issues that cause most of the problems, including: personal grounding, static producing clothing, unsafe work areas, improper handling, storage and transport. Uses humor to help win hearts and minds, change ingrained habits and encourage retention and follow through. Includes a Leader's Guide, learning objectives, review questions, written training certification exam, transcript, and printable certificates for students with passing grades on certification test. Your employees will appreciate this educational and fun training program, as well as help them to reduce scrap! *Winner of Videographer Award of Excellence.*

Time: 21 Minutes. IPC Members: \$375 Nonmembers: \$575 [What Is Training Certification?](#)

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[Free Demos](#)



IPC-OVT-78C

The Seven Sins of ESD Control with Training Certification - Online Video

Now you can purchase an online training tool especially designed to eliminate bad habits and obliterate the deadly Seven Sins of ESD. It's educational and fun -- with the added convenience of 24/7 access from any workstation throughout your facility. You can even deliver it globally across your entire international enterprise! Our new Online Video Training (OVT) program delivers video on demand, over your network infrastructure -- or over your intranet -- for distance learning applications. Now, any computer in your organization can be an instant online training center for ESD Control. It's cost-effective, easy-to-implement, and includes the entire DVD-78C training program -- an entertaining visual analysis of the seven universal ESD issues that cause most of the problems, including: personal grounding, static producing clothing, unsafe work areas, improper handling, storage and transport. IPC Training Certificates are included for students who score 70% or better on the Training Certification test. Train and certify an unlimited number of students at your facility (Site License), or train throughout all your company facilities -- even international sites (Global License). OVT-78C is an ideal way to build your own in-house ESD Control continuing-education / recertification program. Your operators will enjoy a new way to learn, while you'll appreciate the improvement in your scrap reduction program! Time: 21 minutes.

Site License / IPC Members: \$550.00 Nonmembers: \$850

Global License / IPC Members: \$1650 Nonmembers: \$2550.00

[What Is Training Certification?](#)

[What is Online Video Training?](#)

IPC-VT-76

Electrostatic Discharge (ESD) Control

for Non-manufacturing Personnel - Video

Now there's an ESD control training video designed for managers, maintenance, supervisors, salespeople, purchasing staff, and even customers... VT-76 is tailor-made for all the non-technical personnel who travel through electronic production areas. This new video -- produced in cooperation with the ESD Association -- explains and demonstrates (in 3D animation) exactly what ESD is... what causes it... and how to prevent damage to valuable electronic components. Also covers personal grounding and testing; product handling; static fields; and how to recognize and report unsafe ESD practices. No longer do non-technical people need to watch training videos that waste their valuable time with extraneous information. This focused training includes exactly what this audience needs to know. Do your managers and non-technical audiences a favor - next time they're ready for ESD training... show them they're an important part of ESD prevention by providing focused training for their specific needs. Includes Leaders Guide and Testing for ISO-9000 requirements. A *Telly Award winner*.

Time: 18 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-VT-77

Electrostatic Discharge (ESD) Control for Material Handlers - Video

Now there's a training video specifically targeted to eliminate ESD damage during component receiving, assembly transportation, and shipping. No longer do material handlers need to learn from programs designed for operators and technicians -- training that doesn't address their exact needs. This new video -- produced in cooperation with the ESD Association -- includes everything material handlers need to know. 3D animation clearly demonstrates what ESD is... what causes it... and how to prevent static damage during handling. Also reviews typical material handling processes during component receiving, incoming inspection, stockroom storage, kitting, transport to / from production, and final shipping. This program elaborates on the three major causes of ESD handling damage... and provides examples of improper handling for group recognition / analysis. This focused ESD video training is fast, thorough, and effective. Includes Leaders Guide and Testing for ISO-9000 requirements.

Winner of the Axiem Silver Award.

Time: 26 minutes IPC Members: \$300 Nonmembers: \$400

[Free Online Reviews](#)

[Free Demos](#)



IPC-EDU-101

Introduction to Electronics Assembly – Training Course

This media-based training course includes seven DVD programs*, leader’s guide, written testing, and IPC Training Certification for students who pass all seven training modules. IPC certificates of completion provide proof of pre-employment training to qualify entry-level candidates for positions in the electronics assembly industry. Designed for vocational/technical schools, state and federal job training centers, independent training centers, community colleges and anyone engaged in “school-to-work” programs, EDU-101 provides the essential core knowledge to prepare students for careers in the electronics assembly industry. This course may also useful for new hires to broaden their technical perspective on the entire assembly process. Course materials are available for free download over the web, and any training facilitator or HR staff person may administer the program.

*Course Contents include:

1. DVD-53 Overview of Electronics Assembly
2. DVD-54 ESD Control
3. DVD-64 Component Identification
4. DVD-24 Handling in Electronics Assembly
5. DVD-46 Mechanical Assembly of Hardware
6. DVD-17 Electrical Test for Assemblies
7. DVD-66 Safety in Electronics Assembly

Each of the individual course modules are available for free online review using the “Free Online Reviews” button below, or through the mail on a Free Demo DVD.

Click the “Free Demos” button below, and request “Option C, EDU-101 / Intro to Electronics Assembly Demo.” Save up to 38% off of individual list price by purchasing this course.

IPC membership for nonprofit educational institutions is only \$250 annually. Join now and save \$750 on the nonmember purchase price.
IPC Members: \$1500 Nonmembers: \$2250

[What Is Training Certification?](#)

Coming Soon (Fall 2004)

IPC-EDU-102

Surface Mount Assembly – Training Course

Comprehensive course with Training Certificate, comprised of the following seven modules:

1. DVD-33 – Introduction to Surface Mount Assembly
2. DVD-39 – Surface Mount Component Placement
3. DVD-34 – Solder Paste Printing
4. DVD-35 – Solder Paste Defect Analysis
5. DVD-20/21 – Reflow Soldering
6. DVD-51 – Adhesive Application
7. DVD-SMT-C – Surface Mount Workmanship Standards

[Register your email](#) for automatic notification of this product’s release.

Coming Soon (Fall 2004)

IPC-EDU-103

Through-Hole Assembly – Training Course

Comprehensive course with Training Certificate, comprised of the following seven modules:

1. DVD-27 – Introduction to Through-Hole Assembly
2. DVD-47 – Wave Soldering
3. DVD-PTH-C – Plated-Through Hole Workmanship Standards
4. DVD-44 – Component Placement / Manual Insertion
5. DVD-42/43 – Hand Soldering for PTH Components
6. DVD-14 – Hand Soldering for Terminals
7. DVD-41 – Through-Hole Rework

[Register your email](#) for automatic notification of this product’s release.

[Free Online Reviews](#)

[Free Demos](#)



IPC-VT-41 or IPC-DVD-41**Through-Hole Rework - Video / DVD**

Begins by introducing industry specifications J-STD-001B & IPC-A-610B - and includes an explanation of the concept of Process Indicators. It then continues with an animated examination of the invisible problems that can be created during rework to explain why it's so important to avoid unnecessary rework. Reviews each of the tools and materials for through-hole rework (including low-residue fluxes). Individual sections cover vacuum extraction of straight-through (round) leads; partially and fully clinched leads, DIP, and auxiliary heating techniques for large thermal mass boards and inaccessible leads. Also explains industry approved rework techniques for solder defects, including solder bridges, icicles, and excess/insufficient solder. Produced in cooperation with PACE, Inc. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Winner of the Communicator Award.

Time: 45 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-VT-91**Introduction to Surface Mount Rework - Video**

Stresses the importance of avoiding unnecessary rework and shows how a cosmetic fix can create more problems than it solves - including damage to the component, the board and adjacent solder joints. Provides guidelines for rework decisions and basic acceptance criteria. Also covers: flux usage and residues; pre-cleaning; prebaking; flux cored solder types and thicknesses; solder paste application and volume. Discusses practical theory and application criteria for each of the conductive and convective heating systems used in surface mount rework. Includes Leader's Guide and Student Workbook. First in a series of four videos, produced in cooperation with Pace, Inc. *Telly Award winner.*

Time: 25 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-92**Rework of Surface Mount Chip Components - Video**

Begins with an explanation of chip component terminology and size codes. Details flux considerations and land preparation using solder braid and vacuum extractor. Demonstrates industry approved techniques and common problems to avoid during removal and replacement of all types of chip components using the following hand tools: hand soldering iron (single-point and bifurcated tip); pulse heat tweezers; continuous heat tweezers; and hot air pencil. Also explains adhesive bonded components, and special heating considerations for ceramic chip capacitors. Includes Leader's Guide and Student Workbook. Second in a series, produced in cooperation with Pace, Inc. *Telly Award winner.* Two videotapes.

Time: 50 minutes total. IPC Members: \$375 Nonmembers: \$475

IPC-VT-93 or IPC-DVD-93 Gull Wing Rework - Video / DVD

High-quality microphotography and computer animation provide precise visual instruction on industry-approved techniques for the removal of all types of gull wing components (QFPs, SOICs, TSOPs, and SOTs) using a hand soldering iron, thermal tweezers, and thermal vacuum pick. Land preparation using solder braid and vacuum extraction, and component replacement using a hand soldering iron, hot air pencil, continuous flow solder and hot bar are demonstrated. Also covers gull wing component ID / handling, tool preparation and maintenance and heat enhancement techniques. Includes two videotapes, Leader's Guide, Student Workbook. Third in a series, produced in cooperation with PACE Inc. **Available as VHS tape or DVD. Please specify by part number.** Time: 50 minutes. IPC Members: \$375 Nonmembers: \$475

IPC-VT-94 Rework of J-Lead Components - Video

Begins with PLCC / SOJ component descriptions and terminology. Demonstrates component removal with the pulse-heated handtool, and thermal tweezers, using three different heat enhancement techniques (flux, bridge-fill, and solder wrap). Reviews land preparation, component orientation and alignment techniques. Shows component replacement using point to point, continuous flow, and hot air pencil soldering techniques. Also discusses cleaning options. Fourth and final tape in a series produced with PACE Inc. *Winner of the Aegis and Aurora Gold Awards.*

Time: 28 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-95 Surface Mount Rework Stations - Video

Begins with a discussion of the practical uses of rework stations for high volume rework, and for BGAs/ultra fine-pitch QFPs. Continues with an examination of rework issues, including heat source, preheating and component alignment. Explains step-by-step procedures for fine pitch QFP removal, site preparation and replacement. Concludes with a discussion on cleaning and inspection requirements. Includes Leader's Guide and Student Workbook. *Winner of Aegis, and Telly Awards.*

Time: 30 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-96 Ball Grid Array Rework - Video

Begins with a discussion of the advantages and challenges of ball grid arrays, including component descriptions and terminology. Provides an overview of removal/replacement procedures for ball grid arrays, using hot air and conductive heating equipment. Covers site preparation, component alignment, solder paste printing, and preheating considerations. Explores potential problems, including moisture sensitivity, heating of adjacent components/ solder joints, and potential soldering defects. Also reviews X-ray techniques for solder joint inspections/evaluation. Includes Leader's Guide and Student Workbook. *Telly Award winner.*

Time: 22 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Online Reviews](#)

[Free Demos](#)



IPC-VT-97-SERIES Land & Conductor Repair for Electronic Assemblies - Three Tape Series- (A/B & C) Video

Explains common repair techniques for printed circuit assemblies. Each procedure includes damage analysis, industry approved repair procedures and evaluation criteria. The first tape (part A) covers laminate damage repair, rebonding isolated surface mount lands using adhesive bonding film and adhesive backed replacement lands, and rebonding lifted conductors using liquid epoxy overbond. The second tape (part B) covers conductor replacement - with adhesive backed material and liquid epoxy, repairing gaps in conductors, replacing straight and bent conductors, surface mount land/conductor replacement with adhesive backed material, and solder mask replacement. The third tape (part C) demonstrates the industry standard eyelet repair procedure for a damaged plated-through hole (without innerlayer connections) as described in IPC-7721. Begins by explaining when to repair a through-hole, selection of the replacement eyelet - including measurements for board thickness, inside and outside eyelet diameter, length under the flange, flange diameter, and related tolerances. Also covers hole redrilling, funnel and flat swaging eyelets, soldering and conductor replacement. Includes Leader's Guides and Student Workbooks. Does not apply towards quantity purchase discount.

Time: 79 minutes total (Three tapes). IPC Members: \$487.50 Nonmembers: \$618.75

IPC-VT-97A/B

Land and Conductor Repair for Electronic Assemblies - Video

Explains common repair techniques for printed circuit assemblies. Each procedure includes damage analysis, industry approved repair procedures and evaluation criteria. Tape 97-A covers laminate damage repair, rebonding isolated surface mount lands using adhesive bonding film and adhesive backed replacement lands, and rebonding lifted conductors using liquid epoxy overbond. Tape 97-B covers conductor replacement - with adhesive backed material and liquid epoxy, repairing gaps in conductors, replacing straight and bent conductors, surface mount land/conductor replacement with adhesive backed material, and solder mask replacement. Includes Leader's Guide and Student Workbooks. *Winner of the Aurora Platinum Award - Best of Show.*

Time: 57 minutes total/ two tapes. IPC Members: \$375 Nonmembers: \$475

IPC-VT-97C Plated-Through Hole Repair - Video

This third tape in a series on Land and Conductor Repair demonstrates the industry standard eyelet repair procedure for a damaged plated-through hole (without innerlayer connections) as described in IPC-7721. Begins by explaining when to repair a plated-through-hole, selection of the replacement eyelet - including measurements for board thickness, inside and outside eyelet diameter, length under the flange, flange diameter, and related tolerances. Also covers hole redrilling, funnel and flat swaging eyelets, soldering and conductor replacement. Includes Leader's Guide and Student Workbook.

Winner of the Aurora Platinum Award - Best of Show.

Time: 22 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Online Reviews](#)

IPC-VT-44 or IPC-DVD-44

Component Preparation and Manual Insertion - Video / DVD

An introductory overview of the component preparation and manual insertion process. A cast of animated characters explain the kitting or picking process, temporary solder mask application, lead preparation/preforming (using manual and mechanical systems), stress relief theory, lead crimping, lead contamination, legends, component orientation and polarization, adhesive bonding, assembly line operation, ESD basics, personal safety issues, and end product acceptance criteria from the IPC-A-610. Includes Leader's Guide and Student Workbook. **Available as VHS tape or DVD. Please specify by part number. Winner of the Aegis and Communicator Awards.**

Time: 30 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-47 or IPC-DVD-47

Wave Soldering - Video / DVD

Provides an in-depth look at the wave soldering process, beginning with typical setup/adjustment procedures for conveyors, controls, spray, foam and wave fluxers (including rosin, water soluble, and low residue fluxes), convection and radiation preheaters, air knives, and wave adjustment. Also explains thermal profiles, solder compositions, wave shapes and purposes. Reviews standard operating procedures, including adding solder, removing dross, proper clothing, safety requirements, and board stiffeners. A final section on troubleshooting examines common defects, causes and solutions. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Time: 37 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-VT-27 or IPC-DVD-27

Introduction to Through-Hole Assembly - Video / DVD

An introductory overview of the through-hole assembly processes. Begins with a description of the basic functions of typical components and interconnections; component location grids; letter codes and polarity markings. Provides a visual explanation of DIP insertion, axial insertion, lead preforming/manual insertion. Also reviews wave soldering, hand soldering, cleaning and testing. Discusses common problems to avoid, and stresses the importance of the individual operator throughout the process. A useful introduction for new hires and general education. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Time: 29 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Demos](#)



IPC-VT-33**Introduction to Surface Mount Assembly - Video**

An introductory overview of the surface mount assembly processes. Begins with a review of component evolution from through-hole to surface mount, then describes the standard component types. Explains the solder paste printing process; mixed technology assemblies - including adhesive application, autoplacement of components, reflow soldering, infrared, (convection and combination) visual inspection, cleaning, secondary reflow, electrical and burn-in testing. A useful introduction for new hires, cross training, and general education. Includes Leader's Guide and Student Workbook.

Time: 30 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-39 or IPC-DVD-39**Surface Mount Component Placement - Video / DVD**

Introduces viewers to the features of surface mount component placement machines - including the methods of feeding components, the heads used to place the components, the system of rails that transfer the circuit boards through the machine and the vision system that verifies board orientation and the accuracy of placement. Continues with typical set up and operation procedures designed to teach the operator how to interact with these systems. Concludes with a description of the types of problems that can occur with placement machines, possible solutions and tips for preventive maintenance. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Time: 29 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-34 or IPC-DVD-34**Solder Paste Printing - Video / DVD**

First of two-tape series (with IPC-VT-35) begins with an introduction to the key elements in solder paste printing: the circuit board, stencil, solder paste and squeegee. Describes how each element affects the printing process. Discusses automatic and semiautomatic stencil printers, focusing on what the operator needs to understand to set up and monitor all aspects of the printing operation. Concludes with a description of general operator maintenance, emphasizing safety and proper clean-up. Includes Leader's Guide and Student Workbook. **Available as VHS tape or DVD. Please specify by part number.**

Time: 29 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-35-K or IPC-DVD-35-K**Solder Paste Printing - Defect Analysis and Prevention - Video / DVD**

Second tape in a series (with IPC-VT-34) defines typical defects associated with solder paste printing, discusses possible causes, and offers recommended solutions. Reviews lack of coverage, bridging, misalignment, solder paste volume / print shape, including dog-ear, pump, scoop, slope, and edge definition. Adjustments include kneading paste, squeegee pressure and speed, downstop, snap-off, and temperature. Stresses the importance of preventive maintenance. Includes Leader's Guide, Student Workbook and IPC-S-816, "SMT Process Guideline and Checklist."

Available as VHS tape or DVD. Please specify by part number.

Time: 23 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-20/21 or IPC-DVD-20/21**Reflow Soldering - Video / DVD**

Videotape 1 explains the different types of reflow soldering processes, including I/R, convection, and convection I/R. Also covers solder pastes, creams, and fluxes. Videotape 2 provides a detailed study of thermal profiles for reflow soldering. Includes ESD protection, process contamination, and handling considerations. Also demonstrates how solder, flux and components are applied to the board. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Two videotapes. Time: 34 minutes. IPC Members: \$375 Nonmembers: \$475

IPC-VT-51 or IPC-DVD-51**Adhesive Application for Surface Mount - Video / DVD**

Provides an in-depth look at the adhesive application process for surface mount component attachment prior to wave soldering. Begins with an introduction to the two methods of adhesive application - dispensing and stencil printing - and a discussion of the adhesive itself. Also covers typical set-up procedures, operation, troubleshooting and preventive maintenance for both adhesive dispensing systems and stencil printers. Includes Leader's Guide and Student Workbook.

Available as VHS tape or DVD. Please specify by part number.

Time: 34 minutes. IPC Members: \$275 Nonmembers: \$350

[Free Online Reviews](#)

[Free Demos](#)



IPC-DRM-56

Wire Preparation and Crimping - Desk Reference Manual

This handy quick-reference guide explains all the basic principles and procedures for wire preparation and crimping -- for wire harness assemblers, crimp operators, even QA personnel. This handy Desk Reference Manual is a great tool to help explain the most important criteria from the new industry standard on Wire Harness Acceptability, IPC/WHMA-A-620. Using easy to understand computer-generated graphics and language geared towards the most basic factory-level employees, DRM-56 will help insure that your company products meet the required industry standards. Covers wire types, gauges, insulation stripping, wire tinning, terminals and contact types, coaxial cables, IPC product categories and acceptance criteria, wire preparation, strand and insulation damage, conductor deformations, open and closed barrel crimp definitions and criteria, crimp deformations, cut-off tabs, punctures, insulation support crimps, inspection windows, bellmouth, conductor crimp requirements, conductor brush, closed barrel crimps, insulation damage and a glossary of related wire prep / crimping terminology. Size: 32 pages.

Quantity:	IPC Members:	Nonmembers:
1-9	\$30	\$60
10-24	\$24	\$48
25-49	\$21	\$42
50+	\$18	\$36

Sample Download
(0.8MB/PDF)

DVD-65C

Fiber Optic Cable Prep Basics with Training Certification - DVD

Train and certify your operators in fiber optic cable assembly using DVD-65C. Chapter 1 provides a visual introduction to fiber optic cable, common connectors, tools and safety considerations. Chapter 2 details typical fiber optic cable assembly procedures - including stripping the outer jacket and buffer, preparing and injecting epoxy into the connector, crimping the connector onto the cable and cleaving the cable. Chapter 3 demonstrates connector polishing and industry acceptance criteria for the final product. The DVD-65C training package also includes downloadable Leader's Guide, learning objectives, chapter review questions, transcript, training certification test and customizable certificates of completion for students with passing grades... with random-access menu selection and optional **English subtitles** for hearing-impaired and ESL students.

Time: 23 minutes. IPC Members: \$395 Nonmembers: \$495

[What Is Training Certification?](#)

Free Online Reviews

IPC-VT-56 or IPC-DVD-56C

Wire Harness Assembly Methods with Training Certification (DVD only) - Video / DVD

A visual introduction to the wire harness manufacturing process for new hires. Begins by explaining the basic functions of the board, components and wire harness. Clearly demonstrates the entire fabrication process, including: drawings and specification review; wire preparation (cutting, stripping and tinning); shaping the harness; wire termination processes (soldering and crimping); tying the harness; inspection, testing, and quality assurance standards; shipping; installation and safety considerations. Produced in cooperation with the *Wire Harness Manufacturers Association*. Includes Leaders Guide, Student Workbook and written test. *Telly Award winner*. **Available as VHS tape or DVD. Please specify by part number.** DVD includes Training Certification. Time: 30 min. IPC Members: \$350 Nonmem: \$450

[What Is Training Certification?](#)

IPC-VT-58 or IPC-DVD-58C

Introduction to Wire Crimping with Training Certification (DVD only) - Video / DVD

Designed to provide new employees with a visual overview of the wire crimping processes. Explains the terminology and anatomy of crimping, and reviews quality assurance requirements. Begins by exploring wire types, insulation, diameters, gauges, variation, and stripping processes (manual and automatic). Explains terminal types, including ring and spade, insulated and uninsulated, open and closed barrels, and types of contacts. Details manual, semi-automatic, and fully automatic crimping systems – including setup / calibration, bend testing, crimp height measurement, pull testing and production. Reviews acceptance criteria for open and closed barrel crimps, criteria for a preferred crimp, and analysis of typical problems. Includes Leaders Guide, Student Workbook and written test. **Available as VHS tape or DVD. Please specify by part number.** DVD includes Training Certification.

Winner of the Telly Award and ITVA Finalist. Produced in cooperation with the *Wire Harness Manufacturers Association*. Two videos. Time: 40 min. IPC Members: \$395 Nonmembers: \$495

[What Is Training Certification?](#)

IPC-VT-59 or IPC-DVD-59C

Wire Preparation with Training Certification (DVD only) - Video / DVD

A visual introduction to wire preparation for wire harness manufacturing. Begins by explaining wire types, characteristics, AWG, and insulation. Explains typical setup and operation of manual, semi-automatic, and fully automatic wire strippers for low, medium and high volume applications. Defines parameters for cut and strip length, partial strips, cutting depth, wayback values, feed rates, and cut speed. Demonstrates stripping of insulation off multi-conductor cables, removing insulation from large diameter cables, out of round, and twisted-shielded pairs. Includes multiple-step stripping of coaxial cable, and tough insulation. Reviews typical problems including jam-ups and wire curling. Provides evaluation guidelines for nicks, scrapes, broken strands, insulation damage, frays, and reduced insulation thickness. Also covers wire tinning and operator safety. An excellent introduction for new hires. Produced in cooperation with the *Wire Harness Manufacturers Association*. Includes Leaders Guide, Student Workbook and written test. **Available as VHS tape or DVD. Please specify by part number.** DVD includes Training Certification. *Winner of the Communicator Award.* Time: 30 min. IPC Members: \$350 Nonmembers \$450

[What Is Training Certification?](#)

Free Demos



IPC-CD-A1

Electronics Assembly Clip Art Graphics - CD-ROM

CD-ROM contains 100 electronic images of computer graphics created for IPC training videos, suitable for use on PC and Macintosh systems. Full color TIF files at 640 x 480 resolution provide high quality illustrations of hand soldering, wave soldering, reflow soldering, terminals, surface mount component misalignments and solder joints. These images are licensed for internal educational purposes, including technical documents and presentations, multimedia programs, workmanship standards, etc. They may not be resold individually or incorporated into any products for resale.

IPC Members: \$150 Nonmembers: \$200

[Sample Download](#)
(0.4MB/PDF)

IPC-CD-A2

Surface Mount Solder Joint Evaluation Clip Art Graphics - CD-ROM

Create your own training materials using IPC's cutting-edge 3-D graphics and photographs. All of the images from the Desk Reference Manual on Surface Mount Evaluation (DRM-SMT) are now available, in an easy-to-use CD-ROM. CD-A2 has an interactive image browser with low, medium, and high-resolution clip art in .tif format. Search and copy image files for any of the graphics and photos for your own in-house use. Graphics are available both with and without dimension specification lines. For internal use only. Images are not licensed for use in products intended for resale.

IPC Members: \$500 Nonmembers: \$750

[Sample Download](#)
(0.4MB/PDF)

IPC-CD-A18F

Component Identification Clip Art Graphics - CD-ROM

Create your own training materials for Component ID using IPC's cutting edge computer graphics. Contains all of the images from the new CD-A18F, Component Identification Desk Reference Manual, as high resolution .TIF files. Also includes RGB Photoshop layers to separate individual components for display. This collection includes pictures of all 3D component models, schematic symbols and photographs. Also includes color band value charts for resistors, capacitors and inductors. These "clip art" images can be used within internal training programs or in-house technical presentations. (Images not licensed for use in products intended for resale.)

IPC Members: \$400 Nonmembers: \$600

[Sample Download](#)
(0.7MB/PDF)

IPC-CD-A40E

Through-Hole Solder Joint Evaluation Clip Art Graphics - CD-ROM

Use the 77 images contained in this clip-art CD to develop your own training or technical presentations on through-hole solder joint evaluation. Taken entirely from the popular Desk Reference Manual on through-hole solder joints (DRM-40E), this collection of high-resolution computer generated images and close-up defect photography is an ideal way to enhance any training program explaining how to create good solder joints. Also useful for showing what makes a solder connection compliant with the industry standards, IPC-A-610C and IPC/EIA-J-STD-001C, for component, barrel, and solder-side coverage. All of the images are in the TIF file format, and are licensed for unlimited in-house (non-commercial) use.

IPC Members: \$350 Nonmembers: \$500

[Sample Download](#)
(0.3MB/PDF)

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IPC-VT-52 Printed Circuit Overview - Video

Produced for a non-technical audience including sales, administrative, and management, to explain where printed circuit boards fit into electronic products and the global electronics industry. Begins with an overview of electronic chips components, then describes the history and function of printed circuits, including a visual tour of a typical double-sided and multilayer fabrication process. Provides an explanation of the uses and manufacturing processes for related materials, including copper foil and various laminate types, then describes industry market sizes and future trends. Also includes a visual overview of both through-hole and surface mount component assembly operations. Viewers should absorb basic terminology, and an appreciation for the importance of quality and innovation. A valuable introduction and orientation to the printed circuit industry for industry suppliers, colleges, technical/vocational schools, employment recruiting, and material suppliers. *Winner of the Communicator – Crystal Award for Excellence, the Vision Award, and the Aurora Gold Award.*

Time: 31 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-22 Introduction to PWB Fabrication - Video

Designed for new employees in PWB fabrication. Explains the history and function of the circuit board in perspective to the electronics industry. Provides a visual tour of a typical multilayer facility. Also covers personal safety, drugs and alcohol, product handling issues, communication with supervisors, and personal attitude. Also explains typical business costs and the importance of the individual operator toward the success of the company.

Time: 18 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-25 Basic Multilayer Fabrication - Video

A complete overview of each of the manufacturing processes for a conventional 6 layer, pin registered MLB. Explains innerlayer print and etch process, and outerlayer SMOBC. Includes action photography, computer graphics and sample microphotographs at each of the process steps. An important introductory video for all new employees who will benefit from an understanding of this process. (Also see VT-25-SS in Image Resources.)

Time: 35 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-26 Double-Sided Board Fabrication - Video

Visually explains each of the process steps in the double-sided, pattern-plate, tin-lead reflow manufacturing process. Includes action photography, computer graphics and microphotographs at each of the process steps. An excellent introduction to the IPC Operator Awareness Series videos, covering each of the 18 individual processes explained in this series.

Time: 23 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-37**Flexible Circuits Manufacturing - Video**

Introduces each of the manufacturing processes for flex circuits, including single-sided, double-sided, and multilayer fabrication. Action photography and computer graphics visually demonstrate each process step, including roll processing. Also illustrates the uses and advantages of flex circuits. Includes Leader's Guide and Student Workbook.

Time: 30 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-23**Bare Board Handling - Video**

Explains the importance of each person's contribution to the success of the printed circuit board manufacturing process. Provides an interactive format, allowing groups of operators to discuss the causes of handling damage within their specific process. Question and answer sections encourage groups to come up with their own solutions to prevent common handling defects. A valuable resource to promote careful handling and reduce unnecessary defects. Also available in Spanish (Part # VT-23-SP).

Time: 20 minutes. IPC Members: \$225 Nonmembers: \$300

Printed Circuit Board Fabrication Training - Safety**IPC-VT-9****Safety in PWB Manufacturing - Video**

Avoiding incident and injury is the focus of this important video. Each person is encouraged to be responsible for personal safety in the workplace. Also discusses a wide variety of safety equipment from personal clothing to emergency eye washes and showers. Material Safety Data Sheets are explained. The hazards of drug and alcohol use and its implications for safety in the workplace are explored.

Time: 27 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-10**Chemical Safety in PWB Fabrication - Video**

Takes a serious look at handling potentially hazardous chemicals used in the manufacture of printed circuit boards. All facilities must train employees that mix, store, dispose of, or transport any hazardous substance. The basics of what to do in case of a chemical emergency are explained.

Time: 27 minutes. IPC Members: \$225 Nonmembers: \$300

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IPC-VT-81/87 Innerlayer Handling Video Series Innerlayer handling is the primary cause of multilayer defects. This series of seven videos explains the theory of each process and identifies all of the common handling errors that can affect the quality of the final product. By purchasing all seven videos in this series (VT-81~VT-87, explained below) you can save almost 50% off the individual purchase price. Does not apply towards quantity discount purchase. IPC Members: \$900 (individually \$1825) Nonmembers: \$1500 (individually \$2375)

IPC-VT-81 IH Video Series, Part 1: Incoming Inspection, Shearing, and Tooling/Registration An explanation of the defects that can be caused by improper handling during incoming inspection, shearing, and tooling / registration. The purpose of each of these innerlayer fabrication processes is explained, and correct procedures are demonstrated. Visual examples of acceptable and rejectable products are provided, illustrating the range of allowable variation Time: 22 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-82 IH Video Series, Part 2: Pre-image Cleaning Explains mechanical scrubbing, pumice scrubbing, and chemical cleaning. Visual examples of acceptable and rejectable conditions are provided, illustrating the range of allowable variation. Operators are shown how improper handling will affect the product immediately and down the line. Pre-image cleaning may be the most critical processing step in the fabrication of multilayer boards, and perhaps the most neglected. It is important to understand the theory of the cleaning operation, and why it is essential to do it right. Time: 21 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-83 IH Video Series, Part 3: Resist Lamination Addresses the problems of photoresist in a way both new employees and experienced operators will learn from. Includes setup for speed, pressure, heat, registration, and explores typical factors that create exposure or resist adhesion problems, such as improper cleaning, contamination, fingerprints, oxidation, and foreign particles. Explains the effects of bubbles, wrinkles, scratches, gouges, dents, resist chips, and roller imperfections. Discusses the role of protective clothing, trimming, and visual inspection. Time: 31 min. IPC Members: \$225 Nonmembers: \$300

IPC-VT-84 IH Video Series, Part 4: Imaging Videotape #1 analyzes the theory of the print & etch innerlayer imaging operation and provides an overview of each of the processing steps in typical multilayer fabrication. Explains diazo and silver halide phototools, various tooling arrangements, light collimation and deflection, image enlargement, integrator theory, and the step tablet calibration process. Tape #2 covers standard operating procedures, the importance of cleanliness and air filtration, the effects of dust and other airborne contaminants, protective clothing, fingerprint contamination, resist particles, preventive cleaning techniques, static problems and ionization theory, wear and tear on phototools and tooling holes, scratches in exposure surfaces, and the function of the cover sheet. Time: 42 min. two tapes. IPC Members: \$375 Nonmembers: \$475

IPC-VT-85 IH Video Series, Part 5: Developing Explains the innerlayer developing process, and the defects that can be created by improper handling, variations in machine setup, and chemistry. Reviews the effects of each of these conditions during further processing. Time: 16 minutes. IPC Members: \$225 Nonmembers: \$300

IPC-VT-86 IH Video Series, Part 6: Etch / Strip Details innerlayer etch / strip operations, focusing on four variables: solution chemistry, conveyor speed, spray pressure, and temperature control. Operator safety and handling considerations are covered. Time: 18 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-87 IH Video Series, Part 7: Lamination Details pin registration lay-up and lamination processes - and explains the step-by-step sequence of laying up a typical multilayer panel. Proper handling of caul plates, separator plates, copper foil, prepreg sheets and innerlayers is described. The lamination section examines three different types of vacuum press systems: vacuum enclosed presses, vacuum frames and vacuum bag systems. Also contains a description of the process for mass lamination and a brief discussion of automatic optical inspection (AOI) and surface treatment operations. Includes Leader's Guide and Student Workbook. (Seventh and final video in the Innerlayer Handling Series.) Time: 29 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-38 Liquid Photo-Imageable Solder Mask - Video Begins by explaining the purpose and advantages of liquid photo-imageable solder mask. Visually examines each step in the application process, including surface preparation (both abrasive and chemical pre-wash), screen and curtain coating (including thickness evaluation), tack drying, exposure (including environmental controls, clothing, artwork alignment, and machine operation /maintenance), developing (including machine operation for both aqueous and solvent systems), inspection for typical defects, and the operation of a typical curing oven. Includes Leader's Guide and Student Workbook. *Winner of the Vision and Telly Awards* Time: 30 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-89 Bare Board Electrical Testing - Video A visual overview of the principles of final electrical testing for printed circuit boards including process description for Bed of Nails and Flying Probe systems, electrical continuity, resistance/ohms, IS and SH shorts, OP and RO faults, capacitance testing, lot learn/lot comparison (golden board), net-list testing, alignment features, adapters, probe strikes/damage, fault codes, defect analysis systems including head's up display, camera systems and combinations, and an overview of conductor and solder mask repair procedures. An easy way to introduce this relatively complex process for new-hires and cross training. *Winner of the Vision Award.* Time: 29 minutes. IPC Members: \$275 Nonmembers: \$350

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IPC-OA-Series**The Operator Awareness Video Series**

This 18 tape training series explains each of the individual processes for double-sided, pattern-plate PWB fabrication. For new employees, it's the fastest way to learn PWB terminology — and process technology. Even experienced operators can benefit from this video series, considering that more than half of all common board defects are caused by improper handling — and not all by new employees. You can save 63% on the individual purchase price when you order the entire 18 videotape series. Does not apply towards quantity purchase discounts.

EACH Tape in the series- IPC Members: \$225 Nonmembers: \$300
 ALL 18 Tapes in the series - IPC Members: \$1500 Nonmember: \$2500 *
 Does not apply towards quantity discount purchase.
 *Nonmember purchase includes one year free IPC membership.
 Please call Jeanette Ferdman to process your membership 847-790-5309,
 or [email: ferdje@ipc.org](mailto:ferdje@ipc.org).

IPC-OA-101 Incoming Inspection of Laminates - Video

Reviews each of the extensive tests for laminate integrity. Provides visual examples of laminate defects and explains their effects on board quality during further processing. Also demonstrates how to avoid damage to the laminate caused by improper handling. Time: 12 minutes.

IPC-OA-102 Material Preparation - Video

Reviews the fundamentals of laminate shearing and finishing, as well as the complex differences between baking for cure, stress-relief and moisture removal. Your operators will learn how stresses are fabricated into the panels during lamination; when a “stress relief” bake cycle is most desirable; what effect heating a laminate above its glass transition temperature has on the epoxy-resin; how the different thermal expansion coefficients of copper, glass and resin are affected by cool-down, and when a moisture bake is performed on various types of laminates. The importance of proper shearing and edge finishing is emphasized. The effects of loose fibers and other surface defects on photo-resist adhesion are photographically illustrated. Time: 16 minutes.

IPC-OA-103 Tooling and Registration - Video

Explains each of the processes that utilize registration during circuit board fabrication and most of the common handling errors that can create misregistration during artwork layout, tooling, drilling, imaging, solder mask, and profiling. Additional subjects include data systems for both slots and holes, artwork compensation and verification, also minimum annular ring. A complete understanding of the concepts of registration will enable your operators to help prevent those defects that result from the cumulative effects of handling errors and tolerance buildups. Time: 34 minutes.

IPC-OA-104 Drilling - Video

Explores the mechanics of the drilling process - starting with tooling, entry and back-up materials, how to spot drill wear and identify the defects caused by drilling double-sided, copper-clad laminate: external burrs, nailheads and epoxy-resin smear. Provides a general overview of programming to give the operator an understanding of CNC drilling equipment. Also explains the importance of proper drill feed and speed rates to minimize heat and maximize throughput. The care and handling of drill bits is emphasized as well as checks for misregistration and missing holes. Time: 13 minutes.

IPC-OA-105 Deburring - Video

Visually demonstrates how burrs become plated-over, trap contaminants, weaken hole structure, cause cracked corners and break electrical continuity. Deburring machines require proper set-up to protect the thin copper foil from being worn away. Operators must learn to read strike patterns to determine the correct pressure of brush and back-up rolls against the panel. Conveyor speeds have to be adjusted to ensure a shiny, oxidation-free panel, and holes that are free of drilling debris and fibers. Time: 11 minutes.

IPC-OA-106 Electroless Copper Deposition - Video

A complete overview of the process - from manual systems to automatic - explaining each of the baths: cleaner, conditioner, microetch, predip, activator, acid dip, electroless, anti-tarnish, and forced-air drying. Also covers safety requirements and incoming inspection criteria, potential problems, filter and bath maintenance additions, rinse efficiency (both stagnant and cascade), agitation, heaters, drip time and drag-out, and waste treatment. Stresses the importance of controlling chemical concentration, dwell time, temperature, and pH. Concludes with a visual review of final inspection criteria, and laboratory analysis for thickness measurement, rate panel analysis, porosity, evenness, and defect samples. Time: 20 minutes.

IPC-OA-107 Imaging — Dry-Film - Video

Explains the basic steps in the dry-film imaging process: precleaning, lamination, exposure and development, how boards are scrubbed and cleaned, how oxidation is minimized and why it's important. Operators are trained to look for physical defects that prevent dry-film adhesion, such as fingerprints, scratches, and other surface contamination. The importance of proper handling procedures is emphasized. Also demonstrates proper treatment of the photoresist after lamination and why ragged trimming of dry film edges can cause problems in the imaging process. Panel-to-film alignment, and the proper inspection of phototools before development are two more ways that operators can prevent costly errors. Time: 18 minutes.

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IPC-OA-108 Imaging — Screen Print - Video

Reviews the fundamentals of the Screen Print Imaging Process, including screen making, thermal and UV inks, balance between off-contact, floodbar, and squeegee pressures, setup and adjustment of semi-automatic printers. Thoroughly illustrates common defects and inspection requirements, cleanliness, safety considerations, and process documentation. Time: 13 minutes.

IPC-OA-109 Pattern-Plating - Video

Reviews the fundamentals of both copper and tin-lead pattern-plating. Provides visual examples of potential problems and explains their effects on board quality during further processing. Also covers basic equipment (manual and automatic), system upkeep, safety requirements, and associated quality assurance and testing procedures. Time: 11 minutes.

IPC-OA-110 Resist Stripping - Video

Explores the chemistry and mechanics of all types of stripping processes: horizontal, vertical conveyorized and batch. Both the function and purpose of liquid and dry-film resists are visually demonstrated. Also explains why resists must be completely removed before the etching process. Operator prevention of defects is stressed. Reviews inspection criteria for each of the associated defects. The importance of proper handling and safety procedures is emphasized. Time: 10 minutes.

IPC-OA-111 Etching - Video

Provides a visual explanation of the alkaline etching process. Contents cover proper handling and safety precautions, chemical concentration, conveyor speeds, the effects of etchant temperatures, laboratory tests for specific gravity and pH, cross-section analysis, uneven spray pressures, ventilation control, rinsing, and preventive maintenance procedures. Visual examples of over etching, under etching, bridges, broken circuits, nicks, pinholes, and other quality assurance and inspection examples are examined. Time: 16 minutes.

IPC-OA-112 Edge-Board Contact Plating - Video

Explains the tab plating operation - from taping to inspection. Setup and adjustment, chemical concentrations, conveyor speed, rectifier controls, plating thickness, nickel underplate, gold adherence and reclamation, cleaning, tape testing, safety considerations, as well as an overview of the physics and chemistry of the plating operation, are all explored in an easy to understand format. Time: 11 minutes.

IPC-OA-113 Fusing & Solder Coating/Leveling - Video

A review of each of the common fusing and solder leveling processes, including hot oil, infrared, vapor phase, and hot air leveling. Also provides visual examples of voids, dewetting, blowholes, tin-lead slivers, and plugged holes. Discusses the causes of potential defects and the important handling and safety procedures associated with each process. Proper coverage of plated-through holes at the knee is explained; also the formation and consequences of intermetallic growth on long-term storage and solderability. Time: 15 minutes.

IPC-OA-114 Solder Mask: Dry-Film - Video

Reviews the fundamentals of the dry-film solder mask process, including surface preparation, lamination, exposure, development, and curing. Visual examples of potential defects are examined for their effects on board quality during further processing. Proper handling procedures are demonstrated. Also covers associated safety, quality assurance and testing procedures. Time: 13 minutes.

IPC-OA-115 Solder Mask: Screen Print - Video

Reviews the fundamental concepts of screen making, direct and indirect image application, surface preparation, screen printing, adjustment of off-contact and squeegee pressure, and both thermal and UV curing. Also covers solder mask over bare copper. Visual examples of potential defects are examined for their effects on board quality during further processing. Proper handling procedures are demonstrated, and associated safety, quality assurance and testing procedures are also reviewed. Time: 15 minutes.

IPC-OA-116 Blanking Routing & Beveling - Video

The advantages and disadvantages of each process are discussed. Visual examples of improper routing and blanking are provided. Also covered are tooling hole differences, the importance of proper alignment on tooling pins, the operator's responsibility to salvage a misaligned board before it is blanked or routed, proper care and handling of boards, checking for die wear, the evolution from manual to computer controlled routing, and the importance of beveling; how it's done, and why it's necessary. Time: 15 minutes.

IPC-OA-117 PWB Inspection: It's Everyone's Job - Video

Reviews each process in the PWB manufacturing cycle, and examines the common defects that occur during each process. Over 60 major defects are illustrated in a thoughtful and entertaining format. Designed to emphasize the individual operator's responsibility to recognize and prevent problems before they reach final inspection. Time: 16 minutes.

IPC-OA-118 Packaging, Shipment & Storage of PWBs - Video

Reviews the "invisible" problems that cause boards to fail during the assembly soldering operation, including ionic contamination, where it comes from, the effects of fingerprints, the significance of gloves, proper cleaning, rinsing and complete drying, types and porosity of various sealing bags, mechanical protection, slip sheets, sulfur contamination, inventory control, and the fundamentals of the reflow / fusing process, including the formation of intermetallic compound, and its long-term effects. Also reviews each of the soldering defects caused by improper packaging and storage. 18th and final videotape in the Operator Awareness Series. Time: 14 minutes.

EACH Tape in the series- IPC Members: \$225 Nonmembers: \$300
ALL 18 Tapes in the series - IPC Members: \$1500 Nonmember: \$2500

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Printed Circuit Board Fabrication Training - Microsection

IPC-CD-30/31

Microsection Evaluation Training - CD-ROM

This self-paced training covers the complete microsection evaluation process in five sections - beginning with a recap of the qualities of a correctly prepared microsection and an examination of appropriate evaluation equipment.

Measurement of the plated-through hole, the various platings and the laminate is thoroughly covered. A discussion of the role of etching in evaluation is included. Additional sections look at the various evaluation criteria of a microsection's plated-through hole, various platings and laminates. The effects of thermal stressing in evaluations is also included. Comprehensive instruction on the measurement of both metal and laminate structures completes the program. At the end of each section is a quiz. Results from each quiz are stored in a file created for each user, which may then be reviewed by the trainer or system administrator. Stand-Alone version only.

IPC Members: \$375 Nonmembers: \$475 (review not available)

IPC-VT-28

Microsection: Manual Preparation - Video

Examines the procedure for preparing microsections using manual methods for the critical grinding and polishing steps. Provides a complete discussion of the microsection process steps, including removing the coupon from the panel, thermal stressing, mounting, grinding, polishing, and etching the specimen. Training package includes Leader's Guide and Learner's Handbook.

Time: 27 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-29

Microsection: Automatic Preparation - Video

Examines the procedure for preparing microsections using automatic equipment for the critical grinding and polishing steps. Provides a complete discussion of the microsection process steps, including removing the coupon from the panel, thermal stressing, mounting, grinding, polishing, and etching the specimen. Training package includes Leader's Guide and Learner's Handbook.

Time: 28 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-30/31

Microsection: Evaluation - Video

Videotape #1 explains the qualities of a properly prepared microsection, and an overview of evaluation equipment. Also discusses the role of etching and thermal stressing in specimen evaluation. Videotape #2 examines evaluation criteria and measurement techniques for through-holes, platings, and laminate. Two videotape package includes a Leader's Guide and Student Workbook.

Two videotapes

Time: 45 minutes. IPC Members: \$375 Nonmembers: \$475

Printed Circuit Board Fabrication Training - Image Resources

IPC-CD-B1

Printed Circuit Board Fabrication - Clip Art Graphics - CD-ROM

This CD-ROM contains 100 electronic images of computer graphics created for IPC training videos, suitable for use on PC and Macintosh systems. Full color TIF files at 640 x 480 resolution provide high quality illustrations of single-sided, double-sided and multilayer fabrication sequences (copper only, pattern plate, & print and etch processes). Additional illustrations include typical board defects and causes. These images can be used for internal educational purposes, including technical documents and presentations, multimedia programs, workmanship standards, etc. They may not be resold individually or incorporated into any products for resale.

IPC Members: \$150 Nonmembers: \$200

[Sample Download](#)

(0.4MB/PDF)

IPC-VT-25-SS

Multilayer Fabrication - Slide Set

Contains 105 35mm slides used in Basic Multilayer Fabrication (VT-25). Includes computer graphics and sample microphotographs at each process step, to review the contents of the video, or create / supplement your own training program. For internal use only. Images are not licensed for use in products intended for resale.

IPC Members: \$150 Nonmembers: \$200 (review not available)

IPC-VT-30/31-SS

Microsection: Evaluation - Slide Set

Contains 69 35mm color slides and computer graphics used in the development of the Microsection Evaluation video VT-30/31. Can be used to review the contents of the tape, help define your company's specific acceptance criteria, or enhance your existing visual training programs. For internal use only. Images are not licensed for use in products intended for resale.

IPC Members: \$150 Nonmembers: \$200 (review not available)

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Continuous Improvement - Quality

IPC-VT-55-SERIES

Three part video training series On Continuous Improvement

IPC is proud to announce the availability of this new and innovative video training series of three interview-based programs. The series provides ***an overview of Continuous Improvement, specifically tailored for the process level industrial operator within the Electronic Interconnection Industry.*** This series was designed as an initial introduction or ***“first exposure”*** to the CI philosophy. Available for purchase individually or as a set.

Save 25% by purchasing all three tapes as a set.

Does not apply towards quantity discount purchase.

Set prices: IPC Members: \$675. Non-members: \$900

IPC-VT-55A

Introduction to Continuous Improvement for Process Operators - Part 1. (The Cycle Of Benefits) - Video

In this first tape of a three-part video series... operators, managers and quality experts candidly discuss the benefits that flow from implementing Continuous Improvement in the workplace. The program explains the **“Cycle of Benefits”** – as identified by **Dr. Edwards Deming** – gained by employees that implement a continuous improvement program. This informative video is intended to inspire operators to undertake the CI process and to reduce their resistance to change. The training package includes a Leader’s Guide and a Student Workbook. The Workbook uses a group of study questions to stimulate group discussion or can be used as an ISO 9000 compliant evaluation instrument.

Time: 35 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-VT-55B

Introduction to Continuous Improvement for Process Operators - Part 2. (The Road Map) - Video

Second tape in a three part series on Continuous Improvement explains the three typical milestones in implementing CI in the workplace: **Understand the Process; Analyze the Process;** and **Fix the Process.** Also introduces an important tool kit used to accomplish these three major milestones, known in the quality world as the **PDSA** or the **Plan, Do, Study, Act** process. Process operators, managers and a distinguished panel of CI experts speak candidly from their personal implementation experiences. Training package includes Leader’s Guide and Student Workbook.

Time: 28 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-VT-55C

Introduction To Continuous Improvement For Process Operators Part 3. (Teamwork) - Video

Final tape in the three part series on Continuous Improvement explains the role of teamwork, as a “super tool” used in every aspect of the implementation process. The same group of operators, managers and CI experts appearing in VT-55 A and B return to describe their experience of The Four E’s of Teamwork: Educate, Encourage, Enable, and Empower. Each of these four critical process steps is explained in detail. The responsibilities that both managers and operators have in the team building process are candidly discussed and the essential role of Leadership at both the managerial and team levels is emphasized. Includes Leader’s Guide and Student Workbook.

Time: 35 minutes. IPC Members: \$300 Nonmembers: \$400

IPC-CD-149

Introduction to SPC – for Process Operators - CD-ROM

A user-friendly “first exposure” to Statistical Process Control - designed specifically for manufacturing / process operators... this self-paced learning tool explains what SPC is - why it’s important - and how it works - to help build your quality control processes on a solid foundation of knowledge and confidence. Introduction to SPC demystifies the concept of variation within a process, the causes of variation, and associated costs. Also clarifies the conversion of data into statistics, the types and patterns of statistics, and demonstrates process capability and improvement. Introduction to SPC prepares new employees to begin collecting and understanding SPC data. An initial understanding of SPC can go a long way to insure cooperation and accuracy. An Administration feature allows the trainer to view the list of students who have entered the program, and to review each individual’s record. Each record shows the trainer when the student first began the program, how many times each individual has worked in the program, pretest and post-test scores in each section, and the average of all pretest and post-test scores. The trainer can print records, delete any record, or reset tests, allowing the student to retake tests in any section or sections. *Winner of the Communicator Award.*

Stand-Alone Version:

(Train as many as you like - on one PC)

IPC Members: \$495 Nonmembers: \$750

Network Version:

(Site license - for multiple computers at one facility)

IPC Members: \$1500 Nonmembers: \$2250

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Translations - Chinese

IPC-DVD-CH42/43C

Hand Soldering for TH Components with Training Certification

- CHINESE / ENGLISH Version - DVD

Now available in a **dual-language**, Mandarin Chinese / English, DVD version, this hand soldering training program comes with chapter navigation and the digital convenience of two videos contained on one DVD-R disc. A Training Certification Test helps to insure that your students understand and retain the required background knowledge before they begin hands-on training. DVD-CH42/43C explains proper workstation practices, personal safety considerations, ESD prevention, soldering iron types, temperature selection, tip types and applications, heat transfer principles, how to avoid thermal damage, solder types, sizes and applications, flux theory, low residue fluxes, wetting principles, soldering through-hole components onto printed circuit boards, tip tinning, tool maintenance, reheating solder, heat sinks / thermal shunts, soldering thick boards, preheating, cleaning flux residues and solder joint acceptance requirements from IPC-A-610C / J-STD-001C. Contains high resolution micro/action video and 3D animation (from VT-42/43C), also includes a printable certificate for operators with a passing grade on the Training Certification Test.

Time: 45 minutes. IPC Members: \$595 Nonmembers: \$895

[What Is Training Certification?](#)

IPC-DVD-CH54C

ESD Control with Training Certification

- CHINESE / ENGLISH Version - DVD

The new electrostatic discharge control training video is now available in a **dual-language** Mandarin Chinese / English DVD version, with chapter navigation, optional English subtitles for English students, and IPC Training Certification. DVD-CH54C clearly explains all the critical information your operators need to understand in order to control charge build-ups and prevent costly damage to electronic components and assemblies. Covers: the physics of static electricity, how static charges damage components, grounding, wrist straps / shoe grounding / testing, safe clothing, conductive smocks, ESD-safe work areas, elimination of static generating materials, controlling charge build-ups, activities that create static electricity, and proper handling / storage / transportation of ESD sensitive devices. Award-winning introduction to ESD control, produced in cooperation with the ESD Association. Includes Leaders Guide, written Training Certification Test and reusable / color certificates for students with passing grades.

Time: 25 minutes. IPC Members: \$550 Nonmembers: \$700

[What Is Training Certification?](#)

IPC-DVD-CH91

Introduction to Surface Mount Rework

- CHINESE / ENGLISH Version - DVD

A **dual-language** Mandarin Chinese/English DVD version with chapter navigation, DVD-CH91 stresses the importance of avoiding unnecessary rework and shows how a cosmetic fix can create more problems than it solves – including damage to the component, the board and adjacent solder joints. Provides guidelines for rework decisions and basic acceptance criteria. Also covers: flux usage and residues; pre-cleaning; prebaking; flux cored solder types and thicknesses; solder paste application and volume. Discusses practical theory and application criteria for each of the conductive and convective heating systems used in surface mount rework. Produced in cooperation with Pace, Inc. *Telly Award winner.*

Time: 25 minutes. IPC Members: \$375 Nonmembers: \$450

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IPC-DVD-SPSMTC-K**Surface Mount Solder Joint Workmanship Standards with Training Certification****- SPANISH / ENGLISH Version - DVD**

This **dual-language** DVD will help to train Spanish- and English-speaking operators/inspectors in evaluating critical surface mount solder joint requirements from IPC-A-610C/J-STD-001C. DVD-SPSMTC uses 3D animations, computer graphics and microphotography to insure operator-level comprehension of IPC-A-610 SMT acceptance criteria. Course contents include workmanship standards for Chip Components, J-Lead and Gull-Wing solder joints as illustrated in the DRM-SMT-C, Surface Mount Solder Joint Evaluation Desk Reference Manual (copy included free with purchase). The DVD-SPSMTC program also includes a written test – in Spanish – along with printable certificates for students with passing grades. There are no individual seats to purchase, making this an inexpensive and efficient method for training and verifying comprehension for ISO-9000. (Not a substitute for IPC-A610/J-STD-001 Certification Training.) Time: 27 minutes. IPC Members: \$595 Nonmembers: \$845

[What Is Training Certification?](#)

IPC-DVD-SP42/43C**Hand Soldering for Through Hole Components with Training Certification****-SPANISH / ENGLISH Version - DVD**

Now available in a **dual-language** Spanish / English DVD, with chapter navigation and the digital convenience of two videos contained on one disc. DVD-SP42/43C demonstrates proper workstation practices, personal safety considerations, ESD prevention, soldering iron types, temperature selection, tip types and applications, heat transfer principles, how to avoid thermal damage, solder types, sizes and applications, flux theory, low residue fluxes, wetting principles, soldering through-hole components onto printed circuit boards, tip tinning, tool maintenance, reheating solder, heat sinks / thermal shunts, soldering thick boards, preheating, cleaning flux residues and solder joint acceptance requirements from IPC-A-610C / J-STD-001C. Contains high-resolution micro/action video and computer-generated animation. DVD training allows students to toggle between English and Spanish narration, for students who wish to learn English terminology of critical electronics assembly skills. Leader's Guide with written Training Certification Test and Training Certificates for students with passing grades.

Time: 40 minutes. IPC Members: \$595 Nonmembers: \$895

[What Is Training Certification?](#)

IPC-DVD-SP49C**The Seven Sins of Hand Soldering with Training Certification****- SPANISH / ENGLISH Version - DVD**

Now available in a **dual-language** Spanish / English DVD with IPC Training Certification, the 'Seven Sins of Hand Soldering' is the cure for improper soldering techniques that even the most experienced solder technicians succumb to: excess pressure, improper solder heat-bridge, wrong tip size, excessive temperature, improper use of flux, transfer soldering and unnecessary rework and repair. DVD-SP49C exposes each of these sins -- explaining how bad habits can create undesirable results -- while clearly presenting the proper technique so the habit can be eliminated. This visual training tool can also be used proactively for new hires, to prevent bad habits before they start. If you're serious about quality solder joints, this video presentation will be the perfect addition to your company's continuing education / improvement program. Also useful for re-certification 6-12 months after initial training in hand soldering (using IPC's VT- / DVD- / or CD-42/43C). A must for effective and preventive ongoing training to help resolve your most challenging hand soldering problems. DVD-SP49C allows students to toggle between English and Spanish narration, for students who wish to learn English terminology of critical electronics assembly skills. Leader's Guide, written Training Certification Test, and Training Certificates for students with passing grades. *Winner of the US International Film and Video Festival Award for Creative Excellence.*

Time: 18 minutes. IPC Members: \$475 Nonmembers: \$675

[What Is Training Certification?](#)

IPC-DVD-SP54C**ESD Control with Training Certification****- SPANISH / ENGLISH Version - DVD**

Now available in a **dual-language** Spanish / English DVD with IPC Training Certification, our ESD Control training program clearly explains all the critical information your operators need to understand in order to control charge build-ups and prevent costly damage to electronic components and assemblies. Covers: the physics of static electricity, how static charges damage components, grounding, wrist straps / shoe grounding / testing, safe clothing, conductive smocks, ESD-safe work areas, elimination of static generating materials, controlling charge build-ups, activities that create static electricity, and proper handling / storage / transportation of ESD sensitive devices. DVD training allows students to toggle between English and Spanish narration, for students who wish to learn English terminology of critical electronics assembly skills. Award-winning introduction to ESD Control, produced in cooperation with the ESD Association. Leader's Guide with written Training Certification Test and Training Certificates for students with passing grades. Time: 25 minutes. IPC Members: \$550 Nonmembers: \$700

[What Is Training Certification?](#)

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IPC-DVD-SP56C**Wire Harness Assembly Methods with Training Certification****- SPANISH / ENGLISH Version - DVD**

Dual-language DVD with selectable Spanish and English narration tracks provides a visual introduction to the wire harness manufacturing process for new hires. Begins by explaining the basic functions of the board, components and wire harness. Clearly demonstrates the entire fabrication process, including: drawings and specification review; wire preparation (cutting, stripping and tinning); shaping the harness; wire termination processes (soldering and crimping); tying the harness; inspection, testing, and quality assurance standards; shipping; installation and safety considerations. Produced in cooperation with the Wire Harness Manufacturers Association.

Time: 30 minutes. IPC Members: \$450 Nonmembers: \$550

[What Is Training Certification?](#)**IPC-DVD-SP58C****Intro to Wire Crimping with Training Certification****- SPANISH / ENGLISH Version - DVD**

This **dual-language** DVD program contains both Spanish & English language tracks, and was designed to provide new employees with a visual overview of the wire crimping processes. It explains the terminology and anatomy of crimping, and reviews quality assurance requirements. We begin by exploring wire types, insulation, diameters, gauges, variation, and stripping processes (manual and automatic). Then explain terminal types, including ring and spade, insulated and uninsulated, open and closed barrels, and types of contacts, as well as details on manual, semi-automatic, and fully automatic crimping systems - including setup / calibration, bend testing, crimp height measurement, pull testing and production. It reviews acceptance criteria for open and closed barrel crimps, criteria for a preferred crimp, and analysis of typical problems. Produced in cooperation with the Wire Harness Manufacturers Association. Includes Leader's Guide, and Final Exam in Spanish. Certificates of completion are also included for students who pass the Training Certification test.

Time: 40 minutes. IPC Members: \$495 Nonmembers \$595

[What Is Training Certification?](#)**IPC-DVD-SP59C****Wire Preparation with Training Certification****- SPANISH / ENGLISH Version - DVD**

A visual introduction to wire preparation for wire harness manufacturing. This **dual-language** Spanish / English DVD begins by explaining wire types, characteristics, AWG, and insulation. Explains typical setup and operation of manual, semi-automatic, and fully automatic wire strippers for low, medium and high volume applications. Defines parameters for cut and strip length, partial strips, cutting depth, wayback values, feed rates, and cut speed. Demonstrates stripping of insulation off multi-conductor cables, removing insulation from large diameter cables, out of round, and twisted-shielded pairs. Includes multiple-step stripping of coaxial cables, and tough insulation. Reviews typical problems including jams and wire curling. Provides evaluation guidelines for nicks, scrapes, broken strands, insulation damage, frays and reduced insulation thickness. Also covers wire tinning and operator safety. An excellent introduction for new hires.

Produced in cooperation with the Wire Harness Manufacturers Association.

Includes Leader's Guide, and Final Exam in Spanish. Certificates of completion are also included for students who pass the Training Certification test.

Time: 40 minutes. IPC Members: \$450 Nonmembers \$550

[What Is Training Certification?](#)**IPC-VT-11-SP****General Safety in Electronic Assembly****SPANISH - Video**

An important introduction to operator safety in electronic assembly. Covers personal protective wear, including safety glasses, shoes, long hair, etc.; how to avoid personal injury from cuts and burns; prevention of "cumulative trauma disorders;" proper lifting technique; lead exposure and soldering fumes; an introduction to HazMat and MSDS; electrical safety, warning systems, and the importance of good housekeeping. Stresses the importance of operator knowledge and attitude to avoid personal injury. Includes Leader's Guide and Student Workbook. Spanish language version. Time: 24 minutes. IPC Members: \$275 Nonmembers: \$350

IPC-VT-23-SP**Bare Board Handling****SPANISH - Video**

Explains the importance of each person's contribution to the success of the printed circuit board manufacturing process. Provides an interactive format, allowing groups of operators to discuss the causes of handling damage within their specific process. Question and answer sections encourage groups to come up with their own solutions to prevent common handling defects. A valuable space promote careful handling and reduce unnecessary defects. Spanish language version. Time: 20 minutes. IPC Members: \$225 Nonmembers: \$300

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Overviews / Safety

VT / DVD-53	Overview of Electronics Assembly
VT-32	Introduction to Electronic Assembly
DVD-66C	General Safety In Electronics Assembly (Available in Spanish)
VT / DVD-11	Seven Sins of Safety
VT / DVD-24	Handling In Electronics Assembly
VT / DVD-46	Introduction to Mechanical Assembly of Electronics Hardware
VT / DVD-17	Electrical Test for Electronic Assemblies
VT / DVD-57	Stockroom Materials – Storage and Distribution
DRM-53	Introduction to Electronics Assembly – Desk Reference Manual

Hand Soldering

VT-42-43C	Hand Soldering for Through-Hole Components
DVD-42-43C	Hand Soldering for Through-Hole Components
CD-42-43C	Hand Soldering for Through-Hole Components on CD-ROM
VT-49C	Seven Sins of Hand Soldering
DVD-49C	Seven Sins of Hand Soldering
CD-49C	Seven Sins of Hand Soldering on CD-ROM
VT-36	Hand Soldering with Low Residue Flux
VT-14	Hand Soldering – Terminals

Component Identification

VT-64C-K	Component Identification Video
DVD-64C-K	Component Identification DVD
ER-18	Electronic Reference for Component Identification
DRM-18G	Component Identification - Training and Reference Guide

IPC-A-610 & Workmanship Standards

DVD-SMT-C	Surface Mount Solder Joint Workmanship Standards
DRM-SMT-C	Surface Mount Solder Joint Evaluation – Desk Reference Manual
DVD-PTH-C	Through-Hole Solder Joint Workmanship Standards
PSMTS-2	Inspection Sheets for SM Solder Joint Evaluation / class2
PSMTS-3	Inspection Sheets for SM Solder Joint Evaluation / class3
PSMTL-2	Wall Posters for SM Solder Joint Evaluation / class2
PSMTL-3	Wall Posters for SM Solder Joint Evaluation / class3
DRM-40E	Through-Hole Solder Joint Evaluation – Desk Reference Manual
EWS-610	Electronic Workmanship Standards for Surface Mount and Through-Hole Solder Joints
VT-610C-CERT	IPC-A-610C Worker Proficiency Training / Certification
PTHS-2	Inspection Sheet for TH Solder Joint Evaluation / class2
PTHS-3	Inspection Sheet for TH Solder Joint Evaluation / class3
PTHL-2	Wall Poster for TH Solder Joint Evaluation / class2
PTHL-3	Wall Poster for TH Solder Joint Evaluation / class3

ElectroStatic Discharge (ESD) Control

VT-54C	ESD Control
DVD-54C	ESD Control
CD-54C	ESD Control
DVD-78C	Seven Sins of ESD Control
OVT-78C	Seven Sins of ESD Control
VT-76	ESD Control for Non-manufacturing Personnel
VT-77	ESD Control for Material Handlers

Courses

EDU-101	Introduction to Electronics Assembly Training Course
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Rework

VT / DVD-41	Through-Hole Rework
VT-91	Introduction to Surface Mount Rework - Part I.
VT-92	Rework of Surface Mount Chip Components - Part 2.
VT / DVD-93	Gull Wing Rework - Part 3.
VT-94	Rework of J-Lead Components - Part 4.
VT-95	Surface Mount Rework Stations
VT-96	Ball Grid Array Rework

Repair

VT-97A&B	Land and Conductor Repair for Electronic Assemblies
VT-97C	Plated-Through Hole Repair

Through-Hole Processing

VT / DVD-44	Component Preparation and Manual Insertion
VT / DVD-47	Wave Soldering
VT / DVD-27	Introduction To Through-Hole Assembly

Surface Mount Processing

VT-33	Introduction to Surface Mount Assembly
VT / DVD-39	Surface Mount Component Placement
VT / DVD-34	Solder Paste Printing
VT / DVD-35-K	Solder Paste Printing - Defect Analysis and Prevention
VT / DVD-20/21	Reflow Soldering
VT / DVD-51	Adhesive Application for Surface Mount

Wire & Cable

DRM-56	Wire Preparation and Crimping – Desk Reference Manual
DVD-65C	Fiber Optic Cable Assembly
VT-56 / DVD-56C	Wire Harness Assembly Methods
VT-58 / DVD-58C	Introduction to Wire Crimping
VT-59 / DVD-59C	Wire Preparation

Photos and Illustrations / Image Resources

CD-A1	Electronics Assembly Clip Art Graphics
CD-A2	Electronic Images from DRM-SMT
CD-A18F	Component ID Clip Art Graphics
CD-A40E	Through-Hole Solder Joint Evaluation Clip Art Graphics

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Overviews

- VT-52** Printed Circuit Overview
- VT-22** Introduction to PWB Fabrication
- VT-25** Basic Multilayer Fabrication
- VT-26** Double Sided Board Fabrication
- VT-37** Flexible Circuits Manufacturing
- VT-23** Bare Board Handling

Safety

- VT-9** Safety in PWB Manufacturing
- VT-10** Chemical Safety in PWB Fabrication

Multilayer Fabrication

- VT-81** Innerlayer Handling Series – Part 1. Inspection, Shearing, Tooling/Registration
- VT-82** Innerlayer Handling Series – Part 2. Pre-Image Cleaning
- VT-83** Innerlayer Handling Series – Part 3. Resist Lamination
- VT-84** Innerlayer Handling Series – Part 4. Imaging
- VT-85** Innerlayer Handling Series – Part 5. Developing
- VT-86** Innerlayer Handling Series – Part 6. Etch/Strip
- VT-87** Innerlayer Handling Series – Part 7. Lamination
- VT-38** Liquid Photo-Imageable Solder Mask
- VT-89** Final Bare Board Electrical Testing

Double-Sided Board Fabrication

- OA-101** Incoming Inspection of Laminates
- OA-102** Material Preparation
- OA-103** Tooling and Registration
- OA-104** Drilling
- OA-105** Deburring
- OA-106** Electroless Copper Deposition
- OA-107** Imaging – Dry Film
- OA-108** Imaging – Screen Print
- OA-109** Pattern-Plating
- OA-110** Resist Stripping
- OA-111** Etching
- OA-112** Edge-Board Contact Plating
- OA-113** Fusing & Solder Coating / Leveling
- OA-114** Solder Mask: Dry-Film
- OA-115** Solder Mask: Screen Print
- OA-116** Blanking, Routing & Beveling
- OA-117** PWB Inspection: It's Everyone's Job
- OA-118** Packaging, Shipment & Storage of PWB's

Microsection

- CD-30/31** Microsection Evaluation Training on CD-ROM
- VT-28** Microsection: Manual Preparation
- VT-29** Microsection: Automation Preparation
- VT-30/31** Microsection: Evaluation

Photos and Illustrations / Image Resources

- CD-B1** Printed Circuit Board Fabrication – Clip Art Graphics
- VT-25-SS** Multilayer Fabrication Slide Set
- VT-30/31-SS** Microsection Evaluation Slide Set

Continuous Improvement - Quality

- VT-55A** Continuous Improvement for Process Operators.
Part 1. The Deming Cycle of Benefits
- VT-55B** Continuous Improvement for Process Operators.
Part 2. The Roadmap
- VT-55C** Continuous Improvement for Process Operators.
Part 3. Teamwork
- CD-149** Introduction to SPC – Training on CD-ROM

Translations - Chinese

- DVD-CH42/42C** Hand Soldering for Through-Hole Components
- Chinese / English
- DVD-CH54C** ESD Control for Operators - Chinese/English
- DVD-CH91** Introduction to Surface Mount Rework – Chinese/English

Translations - Spanish

- DVD-SPSMTC** Surface Mount Solder Joint Workmanship Standards
- Spanish / English
- DVD-SP42/43C** Hand Soldering for Through-Hole Components
- Spanish / English
- DVD-SP49C** Seven Sins of Hand Soldering - Spanish/English
- DVD-SP54C** ESD Control for Operators - Spanish/English
- DVD-SP56C** Wire Harness Assembly Methods – Spanish/English
- DVD-SP58C** Introduction to Wire Crimping – Spanish/English
- DVD-SP59C** Wire Preparation – Spanish/English
- VT-11-SP** General Safety In Electronics Assembly - Spanish
- VT-23-SP** Bare Board Handling - Spanish

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