NEWSLETTER

sti electronics inc.

Volume 18 • Issue 3

Leading the Way In Electronics

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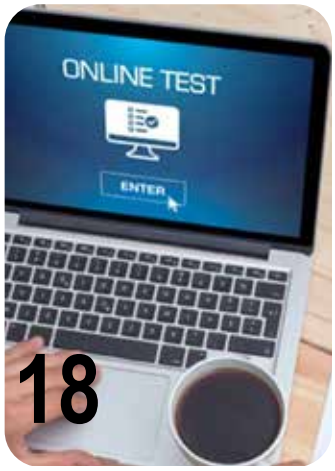
261 Palmer Road, Madison, AL 35758
256.461.9191 • www.stiusa.com
email: info@stiusa.com



Dave's World

September 2020

Each quarter when I write this article, my first tough decision is "what am I going to write about?". This time everything pointed to COVID-19 and how it is affecting STI? You are probably as tired of hearing about that as I am of talking about it, so I will be brief. We are doing fine and externally you should see business pretty close to normal. Diana did a great job coming up with what we needed to do and our whole team has been great about following procedures that can change on a moment's notice.

I want to thank you all that have supported the scholarship at Calhoun Community College in my Father's name. Through your generous donations, the Jim D. Raby Scholarship endowment has more than doubled since it began. We'll soon be making a decision of whether to leave it as is or begin awarding two scholarships each year. If you are interested in making a contribution of any size, please send to:

Calhoun Community College Foundation
P. O. Box 2216
Decatur, AL 35609-2216

Please include a note or letter that the check is intended for the Jim D. Raby Scholarship Fund. I promise it will be put to good use.

David Raby

President/CEO

draby@stiusa.com

We recently *celebrated* Mark McMeen's 20th Anniversary at STI. (*Celebrated*) is a little strong of a word because we didn't get to have the usual cake, speeches and snarky comments. We'll get to that and several others as soon as we feel it is safe to do so. If you know STI, there's a really good chance you know Mark McMeen. Mark is our Vice President of Engineering Services/Manufacturing, which puts him over manufacturing, analytical lab, design team, and anything else we can come up with on the technical side. I won't say he's the brains of our company because we have a lot of smart people doing a lot of different things but Mark is our leader in technology. Mark is responsible for making sure we are headed in the technical direction we need to and is also a frequent speaker at industry events. You will be able to see and hear him on multiple papers at the virtual SMTAI coming up in late September and he serves on various IPC committees. Additionally, he's one of the founders/inventors of our joint venture Magnalytix. STI has changed a lot in the past 20 years and Mark is a big reason for that. I am so glad to have him as a key member of STI's leadership team.

On a sad note, Joyce Donaldson, who worked as a Quality Control Technician at STI from 2011 to 2019 when she had to take an early retirement for medical reasons, passed away in August. Her contagious smile and attitude were already missed at STI but now are missed from this world. Our deepest sympathies go out to Joyce's family and friends.

Thank you for your support of STI over the years and especially during these unusual times we are living through now. Please let us know how we can help you and your company be more successful.

David Raby

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UP CLOSE and PERSONAL

"It is what it is. Don't get mad at something you can't change."

Interview with Michelle Morring

Meet Michelle

Customer Service Manager

How long have you been part of STI Electronics, Inc.? 13 years, 2 months or 158 months

What do you do for STI? I schedule students for classes. Receive orders for components, kits, etc.

Sasha

Just For Fun

Tell us about your family. I have been married to Randy (my best friend) for 14 years. I have 2 kids a son Kevin, that is married and will be 30 this year (gosh I am getting old) he gave me 2 HANDSOME Grandsons that are 9 and 2. A daughter Nicole, who is 24 and Married and gave me a BEAUTIFUL Granddaughter that is almost 2. I am also helping take care of my Mother Linda.

Gizmo

Kevin & Taylor

Tell us about your pets. I have 2 fur babies, a Dog (Sasha) she is about 55 pounds and a Cat (Gizmo) he is about 23 pounds. Both are spoiled.

Do you have a favorite place to visit? My favorite places to visit is Gatlinburg, Albuquerque, NM and Tulsa, OK.

Bryant & Ronald

What's your favorite type of music/song/artist? My 2 favorite artists are ELVIS and George Strait

What's your favorite movie or TV show? NCIS

What's your favorite meal/food? ? I LOVE JUST GOOD OLD COUNTRY COOKIN'

Nicole, Dylan, & Gracelynn

Tell us about any hobbies that you enjoy. Since I am just now getting used to being home and not traveling, I am still trying to figure out a hobby.

What's one fun thing to know about you? My husband plays in a local band. So, every once in a while, I become a drum tech. Helping him set up and tear down his drums (at 2 in the morning).

What's your favorite thing about working at STI? My coworkers, which includes everyone here.

What is your favorite non-profit to support and why? Cancer research. I lost my Dad, Grandmother and an Aunt all to cancer.

Me & Mom

CELEBRATING

38 1982-2020

Leading the Way In Electronics

STI Electronics, Inc. is a full service organization for training, consulting, laboratory analysis, microelectronics assembly, prototyping, and small to medium volume PCB assembly as well as electronic and industrial product distribution. STI began in 1982 in San Dimas, CA but relocated to Madison, AL in 1993.




Thank You For 38 Years & We Look Forward To Many More!

Mark McMeen
VP. Engineering Services/Manufacturing
mmcmeen@stiusa.com

Caaroline Spencer
Analytical Lab Manager
cspencer@stiusa.com

Why is my ROSE / OMEGAMETER Tester not a good tool for determining cleanliness with Today's Fluxes vs. an Ion Chromatography test for specific ionic species in the Anion / Weak Organic Acids / Cation Families?

Written by Mark McMeen V.P. of STI
and Caroline Spencer Ph.D, Analytical Lab Mgr.
Supporting peer review: Mike Bixenman Ph.D and David Lober Kyzen Corp.

This question was asked of me this week by two clients who were detecting failures in their test area as well as in their final inspection, even though their ROSE /OMEGAMETER DATA was sub 0.1 micrograms / c. The ROSE and OMEGAMETER was developed in the early '70s and became more standardized in the early '80s to measure the NaCl equivalent of soluble ionic contamination that could be dissolved into a 75% 2-propanol and 25% deionized water solution. The issue – ROSE is useful for measuring high conductivity ionic species such as - chloride, nitrate, sulfate, and nitrites. Still it will be blind to weak organic acids such as adipic, formate, acetate, succinic and any of the dicarboxylic acid groups. Most Anions and Cations have a high enough ionic conductivity threshold to be measured in a ROSE style conductivity test cell but the more sophisticated flux systems of today are using weak organic acids / dicarboxylic acid in their chemical makeup which makes them blind or unable to measure their presence because the test criteria is a conductivity cell which requires a high level of conductivity per cm2.

What is high conductivity and what is low conductivity? The answer lies somewhere between 5 microsiemens per cm and 1000 microsiemens per cm. Let us review some of the weak conductivity acids-
Acetic acid – 318 microsiemens /cm
Adipic acid - .2 microsiemens /cm
Benzoic acid - .003 microsiemens/cm
Butyric acid – 455 microsiemens/cm
Carboxylic acid - 5 microsiemens/cm
Dichloroacetic acid – 0 microsiemens/cm
Propionic acid – 479 microsiemens/cm
Succinic acid – 35 microsiemens /cm

Chloroacetic acid – 1.4 microsiemens /cm
Ethyl acetate - .00001 microsiemens /cm
The above examples show the relatively low ionic conductivity values for these weak organic acids which is why they run blindly to the electrical conductivity measurement cell of the ROSE style test equipment.

Examples of high conductivity anions and cations –
Sodium Chloride – 67200 microsiemens / cm (note the default equivalent ionic species in a ROSE Test – (NaCl)
Ammonium chloride – 91800 microsiemens/ cm
Ammonium nitrate – 59000 microsiemens/cm
Lithium chloride – 52600 microsiemens/ cm
Potassium sulfate – 45800 microsiemens / cm
Sodium sulfide – 61200 microsiemens /cm

As you can see, if the conductivity of the ionic residue is above 10,000 microsiemens/cm the ROSE test would be able to measure a conductivity value, but as the conductivity is below 1000 microsiemens / cm, the ability to measure the low conductivity weak organic acids becomes very difficult. Also, one must remember for the ROSE to measure the conductivity of ionic residue, the ionic species must be soluble, and it must have a high enough concentration level within the 75/25 solution both volumetrically and concentration wise for it to be a measured solution volume. Again, without solubility of the ionic residue, and in enough concentration, the ROSE Test cannot measure its presence in a NaCl equivalent measurement.

EXAMPLE:
Let us review a ROSE / OMEGAMETER TEST RESULT WITH AN IC TEST RESULT:
ROSE / OMEGAMETER:
AREA OF BOARD SURFACE: 75 cm2 (dynamic test)
Result: .01 micrograms/ cm2
Pass criteria: 1.56 micrograms / cm2
RESULT: PASS by the ROSE TEST

IC RESULTS FROM THE EXACT SAME BOARD AFTER ROSE / OMEGAMETER TESTING
ANIONS:
1. CHLORIDE: 2.01 MICROGRAMS / in2 or .311 micrograms / cm2
2. BROMIDE: 1.56 MICROGRAMS/ in2 or .243 micrograms / cm2
3. PHOSPHATE: .75 MICROGRAMS/ in2 or .116 micrograms/ cm2

Weak organic acids:
1. Acetate: 21.05 micrograms/ in2 or 3.26 micrograms/ cm2
2. Formate: 7.56 micrograms/ in2 or 1.17 micrograms / cm2
3. Adipic acid: 73.15 micrograms/ in2 or 11.34 micrograms / cm2
4. Maleic acid: 5.65 micrograms/ in2 or .876 micrograms / cm2
Total WOA – 107.36 micrograms/ in2 or 16.64 micrograms / cm2

Cations:
1. Sodium: 6.63 micrograms/ in2 or 1.03 micrograms/ cm2
2. Ammonium: 11.79 micrograms/ in2 or 1.83 micrograms/ cm2
3. Potassium: 8.99 micrograms/ in2 or 1.39 micrograms / cm2

Results: THE CLEANED ASSEMBLY FAILS THE ION CHROMATOGRAPHY TESTING DUE TO HIGH LEVELS OF WEAK ORGANIC ACIDS - cleaned assemblies should have WOA levels of <25 micrograms / in2 or <161.29 micrograms/ cm2.
As one can see, the IC gives a very detailed qualitative analysis of which species of Ionics are present as well as quantitative analysis which details the amount or numerical assignment of what is there. This is why IC is a good referee for a ROSE/ OMEGAMETER test by giving you useable data both qualitatively and quantitively as to what species is present and its corresponding amount or volume. Based on real data and its ionic species one can now track down the source of the problem.

This is why for years, the Ion Chromatography (IC) test, has the ability to distinguish and measure the different ionic species present and in quantity, and thus was used as the referee test. IC testing is a useful tool and has been used to referee the ROSE, but it is not a perfect test either and has its limitations because it is normally used as a whole board extraction and not a site-specific analysis where by high ionic levels may be more deleterious to electrical performance in certain component locations. An entire board extraction may dilute the specific high concentration level of a particular component, such as a BTC (bottom terminated part) that may not have adequately outgassed due to its component package style -i.e. BTC or LGA.

This is why we are seeing a return to SIR – surface

insulation resistance testing of specific component designs and packages on custom specific SIR test vehicles so one can test underneath those component packages that are most prone to improper outgassing or improper cleaning and thus can hold those ionic species which are more problematic between signal and ground pins. SIR testing is a tool that allows one to determine the electro-chemical response as it relates to surface insulation resistance at its most critical point between adjacent pins and ground to signal pin locations + /- areas. SIR testing, along with IC testing allows the design and process engineer the ability to see what is happening underneath complex components and high pin count devices and thus ensure that their material choices and manufacturing processes are capable of meeting their cleanliness levels as defined by SIR levels. What are your log ohm cleanliness levels underneath your critical components and highly dense PCB assemblies? This quick explanation is designed to help those better understand why the ROSE / OMEGAMETER is not the perfect process control tool for determining if our assemblies are clean enough but it is a gross test for those Ionics that are highly conductive and, in enough volume, and are soluble to find. The IC is a useful tool for defining what ionic species are present but not necessarily where they are located and if they are there in a large enough volume to be detrimental to the end product based on lack of location influence. The custom SIR test vehicle with specific component packages such as BTC's and LGA's are good test vehicles for determining your most challenging component packages and locations because the SIR gives site specific reference data that can be applied to designers and process engineers. The ability to see underneath specific component packages allows one to dial in their process and their material choices to ensure the overall system meets the end designer and customers expectation on warranty and field use as it relates to overall board cleanliness levels. The IC test and the SIR specific test vehicle / component package test card allows one to gather REAL test data and objective evidence to meet section 8 of J-STD-001. These are the tools and tool sets of the future that will enable us to define cleanliness as it relates to finished assemblies and their expected warranty objectives.

The future may hold the ability to use SIR test data as a process control tool whereby the SIR test data can be run and calculated in 1, 2, 4, 6 or 8 hours periods and the SIR data predict the long term correlated reliability data to the 168-hour qualification SIR test used to verify a manufacturing process and material choices. SIR testing is an actual electro-chemical test that validates site-specific material choices and manufacturing process parameters to ensure compliance. What if we could use the qualification – SIR golden graph image of 168 hours as our control and then measure and overlay a quick SIR test of 1, 2, 4, 6 or 8 hours to verify our process control that our materials and manufacturing process has not deviated from the Golden qualified image (Validation test) – then we would have created a process control tool that validates our qualification plan on cleanliness and we can then use it to verify on a lot to lot basis or month to month basis that we are in control. If this sounds interesting and you would like more information call or email Mark McMeen at 256-694-1293 or mmcmeen@stiusa.com for more details about the future of cleanliness as it relates to high density and complex component assemblies.

If you have any questions or comments please feel free to call or email

Caroline Spencer, Ph.D.
256-705-5531
cspencer@stiusa.com
or
Mark McMeen, V.P.
256-694-1293
mmcmeen@stiusa.com

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On-line IPC Training & Certification

Register Now

IPC Training Center

In response to the COVID-19 pandemic, IPC has worked diligently to develop a remote testing solution that will allow certification/recertification candidates the ability to take certification exams remotely.

In addition to our classroom and on-site training courses, starting immediately STI will be offering on-line training and remote testing for the following IPC lecture based Certification/ Recertification courses:

- IPC-A-610 Certified IPC Trainer (CIT) and Certified IPC Specialist (CIS)
  -Standard required for class
- IPC/WHMA-A-620 CIT, and CIS
  -Standard required for class
- IPC-A-600 CIT and CIS
  -Standard required for class

Note: Currently hands-on courses are not available for on-line training or remote testing for CIT's or CIS's.

The following on-line courses are available for Certified Subject Matter Expert's (CSE's)

- IPC-A-610, IPC/WHMA-A-620, IPC-A-600, IPC-7711/7721 and J-STD-001
  -Standard required for class

Exams that are required for these courses can now be proctored remotely using IPC EDGE.

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MIXED TECHNOLOGY TRAINING KIT with LEAD Free Option

Now available in both Lead Free and Tin Lead versions, the Mixed Technology Solder Training Kit offers a realistic mixture of Through-Hole and SMT technology. It contains many of the common components found in mature technology applications for both through-hole and surface mount production. It is our most popular training kit due to its tremendous flexibility for production training. The Solder Training Kits provide a cost effective and consistent approach to solder training. Instructors no longer have to spend their valuable time keeping track of inventory and sorting through production scrap. The parts are packaged in static shield bags to promote ESD practices. The kits are a reliable and economical way to ensure that each student and each class receive the same training materials. All parts and boards are guaranteed solderable. Custom boards, kits, and individual parts are also available. The Combination Kit has increased focus on SMT as reflected in additional component count.

To place an order or for more information click on the link below.

https://stiusa.com

Lead Free SKU#: 405-1075

Tin/Lead SKU#: 405-1003

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Do you have a question?
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HAPPENINGS

Mark
20th Anniversary

Mark is the Vice President of Engineering Services/Manufacturing. Mark oversees the daily operations of the Engineering Services division of STI. With over 20 years of experience in the manufacturing and engineering of electronic assemblies, Mark has been a major contributor to the success of STI.

STI would like to thank Mark for his 20 years of service he has given to the company.

Katrena
10th Anniversary

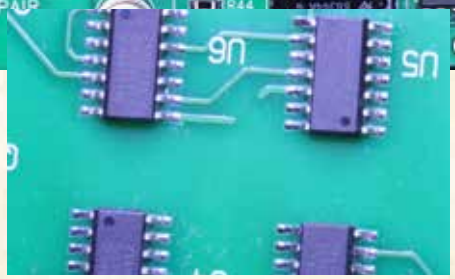
Katrena is the Test Engineer for Manufacturing. She has given 10 years of service to STI. We applaud her determination and effort she has demonstrated during her time here. We look forward to seeing all of the great things we know she will accomplish in the upcoming future.

Thank you Katrena!

Congratulations

"Coming together is a beginning. Keeping together is progress. Working together is success."
~Henry Ford

IPC 7711/21 Advanced Rework Repair Certification Kit



Meets all the requirements for the IPC 7711/21 Revison C training program and includes many options and special features:

- Optional components: BGAs, SMT Tantalum Caps, 0201 Resistors
- Inner layer and multi-layer repair sections (4 layer)
- Conformal coating already applied to a section
- Surface conductors already damaged for repair
- Components with adhesive staking

UPCOMING SCHEDULE

IPC 7711/7721 CIT Certification
September 21 – 25, 2020
December 14 – 18, 2020

IPC 7711/7721 CIT Recertification
November 9 – 10, 2020

IPC 7711/7721 CIS Certification
December 7 - 11, 2020

IPC 7711/7721 CIS Recertification
September 30 – October 1, 2020
December 3 - 4, 2020

SKU: 405-2874 IPC 7711/21C Advanced Rework Repair Certification Kit Lead Free

SKU: 405-2875 IPC 7711/21C Advanced Rework Repair Certification Kit Tin Lead

ORDER NOW

While Supplies Last

800-858-0604

Pat Scott
Training Services Manager
pscott@stiusa.com

TRAINING SERVICES

Update on IPC Courses

Frank Honyotski
Lead Master Instructor
fhonyotski@stiusa.com

Welcome to another article about what's taking place in Training Services. In this issue we want to highlight changes coming to some IPC training programs.

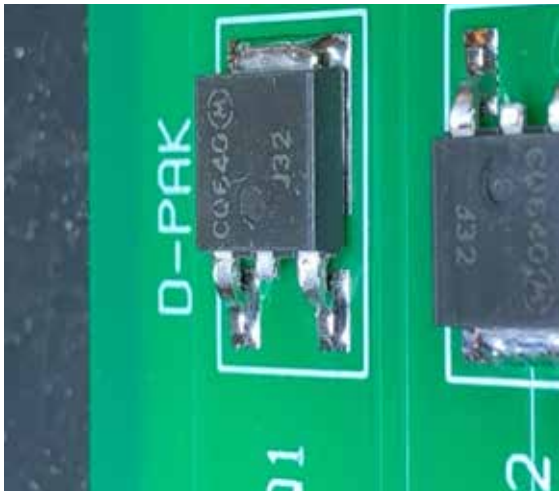
The IPC 7711C/7721C document has passed final ballot on the Amendment 1 which adds two new procedures to the document on D-Pak install and removal.
It should be available to purchase in the very near future. If you are familiar with the training program then the procedures will not be unfamiliar to you as they are the same ones that show up as proposed procedures in the course. The procedure numbers that were proposed are still the same so procedure 3.12 for removal and 5.9 for installation. The training materials reflecting the change will be available soon to download so check your resource files on the IPC Edge.

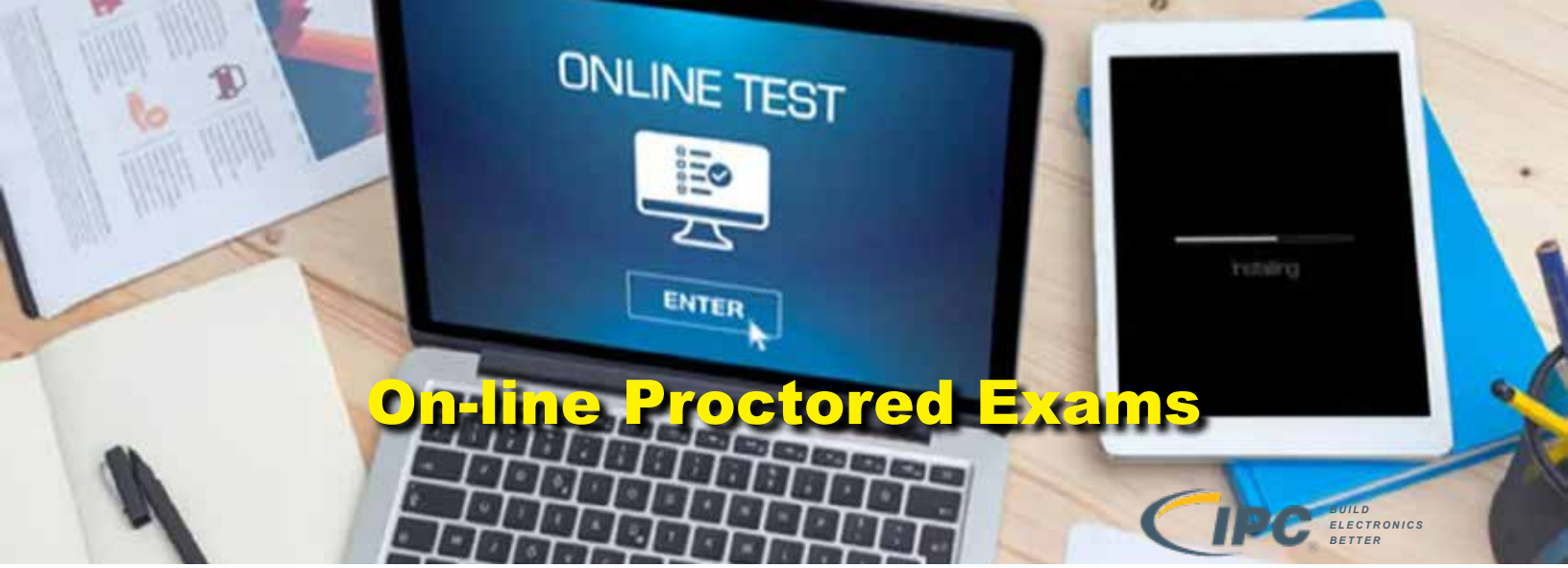
The IPC/WHMA-A-620D training materials should also be available soon. Just check your resource on the IPC Edge and you can start using them as soon as they are available. You do not have to

purchase the training materials for the new 620D course as the cost is covered by your course testing fee when you certify or recertify as a CIT every 2 years. Your organization is not required to teach the latest revision of any IPC document so check with your organization to find out what your contractual obligations are before starting to teach a new revision. While the training materials are available through IPC at no additional cost, the documents that the courses are based on must be purchased separately. If you need new documents, STI Electronics is a licensed IPC Distributor so please contact our friendly Customer Service group and request a quote today!

Some of the major changes coming to the IPC/WHMA-A-620D is the removal of the Target condition and the Solderless Wrap section. The Target criteria was moved into the acceptable criteria where applicable.

Check out our website or call Customer Service if you would like to register for the new 620D training when it becomes available. We look forward to seeing you in class either remotely or in person.





On-line Proctored Exams

As a result of the requirement for many employees worldwide to shelter-in-place, we have received several inquiries asking us how company employees can receive their IPC certifications.

STI and IPC have been working diligently to provide a solution for our customers. As a training center, we can provide virtual training for all IPC certifications (CIS, CSE and CIT), except for the hands-on modules of IPC J-STD-001 and IPC-7711/21.

We have been working closely with IPC to provide "online proctored exams" so your employees do not need to take the certification exam in a classroom setting. To take the exam, your employees will need a broadband internet connection, a webcam, and a microphone, as well as administrative rights to install the proctoring app on the computer they will use to take the exam. A comprehensive user guide (currently in English, Mandarin, French, German and Spanish) provides instructions on how to set up and take the remotely proctored exam. Everything else is the same. Simply complete your training, schedule the exam with your instructor, and take your certification exam.

For more detailed information watch the IPC Proctored Exam Webinar (remember to use the Access Password: S8#31?23)

We look forward to supporting your certification needs. Please contact STI to schedule your virtual training or your proctored online exam.

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