

DfR Solutions
reliability designed, reliability delivered

DfR Solutions January/February Newsletter

[Dr. Randy Kong Joins DfR Solutions!](#) | [Design for Excellence \(DfX\) is Back!](#)

Happy New Year to our valued readers and clientele! In response to overwhelming demand, we have focused this edition of our newsletter on the two leading issues in electronics today: [Counterfeits](#) and [Environmental Legislation](#)

Counterfeits Continue to Proliferate

The occurrence of counterfeit parts has [skyrocketed](#) over the past several years as component life cycles have become shorter and [RoHS](#) and [WEEE](#) legislations have introduced additional opportunities for counterfeiting. While the introduction of these fakes into [defense](#) and [aerospace](#) programs is especially concerning, there is one piece of good news: Counterfeiters can get [caught](#). For more information, please contact [Nathan Blattau](#).

Counterfeit Prevention and Detection Strategy

One of the limitations of the current conversation on counterfeits is the failure to identify a systematic approach to risk mitigation. By incorporating the probability of counterfeit exposure, the purchase volumes, and the cost of failure, this [strategic tool](#) can be used to identify the detection and avoidance techniques that provide the greatest return on investment. For more information, please contact [Greg Caswell](#).

Counterfeit Prevention and Detection Techniques

Once a strategic approach is defined, the next step is to identify the appropriate mitigation techniques. While a good first step is to use [authorized distributors](#), business situations sometimes prevent this. This [white paper](#) provides the framework for a viable testing program by identifying and detailing useful equipment and test methodologies. For more information, please contact [Tom Johnston](#).

Where is RoHS Today...

The last half of 2009 was rife with predictions on the status of RoHS2, including the mysterious [11th Category](#), [exemption recommendations](#), and [DfR's own insight](#).

However, all speculation ceased when the proposed [RoHS2](#) was released. While a more complete list of changes is provided [here](#), the biggest ones are:

- Medical and Monitoring / Control Equipment will be covered
- The list of banned substances has NOT changed
- Compliance to RoHS will now require the CE mark
- All lead (Pb) solder/plating [exemptions](#) remained, but will be phased out in four years

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...and where will RoHS be Tomorrow?

As made clear in the [IPC](#) and our [ruminations](#), the consumer industry is supportive of RoHS expansion. And the EU is willing to oblige. The [rapporteur](#) is now [recommending](#) that all electrical equipment be covered under RoHS and all brominated and chlorinated flame retardants be banned (see the full [proposal](#) and [arguments](#).) Amendments are possible until end of February and an initial vote is not expected until late April, so stay tuned. For more information on RoHS, please contact [Craig Hillman](#).

What about China RoHS?

Last October, China's Ministry of Industry and Information Technology (MIIT) released the [Key Administrative Catalog for the Pollution Control of Electronic Information Products](#) (Batch 1). This document, which identifies the specific products covered by China RoHS, is currently limited to phones and printers. Additional versions covering other equipment are expected. While some exemptions are allowed, the biggest concern is the requirement for testing at specified labs in China. For more information, please contact [Randy Kong](#).

Industry Response

The electronics industry continues to respond to the pressures of environmental legislation. The use of Pb-free solder continues to rise, with current Pb-free [levels](#) projected to increase to [90% of all solder](#) by 2011. This evolution is being driven by the transition to Pb-free assemblies in non-consumer markets, such as [telecom](#), [high-end servers](#), [automotive](#) and [medical](#). For more information on preparing for this transition, please contact [Randy Schueller](#) or [Cheryl Tulkoff](#).

DoD Finally Gets Busy with Pb-free

After an initial delay, with primarily [Aircraft Advisories](#) for guidance, the DoD has had a flurry of recent activity. These included experimenting with lead-free [manufacturing](#), a [white paper](#) by the PERM group, identifying [best practices](#) in lead-free, and developing a [DoD-wide policy statement](#).

What's next? There is currently a strong push at all levels for a comprehensive [funding effort](#) to find acceptable replacements for lead (Pb) in aerospace / defense electronics. At the same time, DoD is unlikely to ban lead-free solder. It will instead focus on lead free control plans. A potential alternate approach is the [Verizon way](#): they have introduced so many requirements that none of their suppliers will ever go lead-free. For more information on lead free control plans, contact [Craig Hillman](#).

RoHS and REACH in America?

RoHS seems increasingly unlikely, as the attempts at a California RoHS ([AB 2202 / 2006](#), [AB 48 / 2007](#), [AB 218 / 2008](#)) or RoHS reporting requirement ([AB 147 / 2009](#)) have all failed and the American RoHS, H.R. 2420, seems to have [died](#) despite NEMA's [energetic effort](#) to keep it alive. For more information, please contact [Craig Hillman](#).

What Has Pb-Free Solder Done to the Circuit Industry?

Ever wanted to scream over Pb-free and printed circuit boards? [Just sing along instead](#) (Thanks again Joe!). The first person to decode the lyrics will win a prize.

DfR News

DfR Solutions Welcomes Dr. Randy Kong

DfR Solutions is proud to [announce the hiring of Dr. Randy Kong](#), an industry renowned expert in the fields of process reliability qualification, component engineering, and meeting OEM reliability requirements. Prior to joining DfR Solutions, Dr. Kong was responsible for establishing a failure analysis lab through his work at Hewlett-Packard. Most recently at Microsoft, Randy co-founded the reliability engineering group for the hardware division, led the development of a component engineering database which captured application-specific requirements, and established quality/reliability processes which emphasized DfX principals. Randy holds a BS in Electrical Engineering from Tsinghua University and has a Ph.D. in Physics from the Graduate Center of City University of New York.

For more information or to schedule an onsite visit at your facility, please contact [Dr. Randy Kong](#).

Air Force Recognizes DfR as Experts in Hardware Reliability Prediction

DfR is pleased to have won several research contracts [earlier this year](#) and we are proud to announce our [latest research contract award](#) from the United States Air Force in the area of Physics of Failure (PoF) based reliability predictions of lead-free solder. For more information, please contact [Nathan Blattau](#).

Influence of Moisture on Delamination

Damage to printed circuit boards (PCBs) during Pb-free assembly is of increasing concern for the electronics industry. In [this interview](#), [Cheryl Tulkoff](#) discusses the research initiated by DfR Solutions and Gold Circuits to better understand the influence of moisture on delamination using capacitance measurements.

DfR's QFN Article Chosen as Most Popular in SMT Magazine

Industry-leading trade magazine SMT named [Craig Hillman](#) and [Cheryl Tulkoff's](#) article "[Design, Manufacturing, and Reliability Challenges with QFNs](#)," as one of the Three Most Popular Articles of 2009. While we tend to think that most of our articles are "top notch," it is truly an honor to be recognized among the industry's best.

It's... Another Girl at DfR Solutions!

Carrie Sharik-Ernest, DfR's Marketing Communications Manager, and her husband Robert welcomed their first child, Alivia Marie Ernest, on October 29, 2009. While guesses were being made by some of the staff around the office as to when Alivia would be born, most of us were just hoping that she wouldn't be the youngest attendee at DfR's October [DfX course](#). Thanks for hanging in there Alivia. And welcome back Carrie!

Upcoming Events

DfR in Sunnyvale, CA (December 10-11)

Dr. Craig Hillman of DfR Solutions visited companies in the Northern California area in mid-December. If you and your associates are interested in a future onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

PERM Conference (Oakridge, TN: January 4-6)

DfR's [Nathan Blattau](#) and [Joelle Arnold](#) attended the [PERM](#) conference in Oakridge, TN where DfR presented "[Shock, Vibe and Reballing: SBIR Results and Future Work](#)."

DfR in Southern California (January 18-20)

DfR Solutions will be visited companies in Southern California (San Diego, Los Angeles) in late January. If you and your associates are interested in a future onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

DfR Solutions in the Bay Area (January 20-22)

DfR Solutions will be visited companies in the Bay Area / Northern California in late January. If you and your associates are interested in a future onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

RAMS (San Jose, CA: January 25-27)

[Jim McLeish](#), CRE, will be in San Jose, CA, at the Reliability and Maintainability Symposium (RAMS) in late January. Jim will be presenting a paper entitled, "[Enhancing MIL-HDBK-217 Reliability Predictions with Physics of Failure \(PoF\) Methods](#)," in which he will discuss potential enhancements to the handbook using Physics of Failure methods.

IMAPS Chesapeake Conference Meeting (Columbia, MD: January 27)

Dr. Craig Hillman will be presenting "[Manufacturing and Reliability Challenges with QFN Packages in Pb and Pb-Free Environments](#)," at the upcoming IMAPS conference. For more information on this topic, please contact [Craig Hillman](#).

DfR in Huntsville, AL and Atlanta, GA (February 16)

DfR Solutions will be visiting companies in Huntsville, AL and Atlanta, GA in mid-February. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#) or [Vaughn Carlson](#).

MDA Mission Assurance Conference (Huntsville, AL: February 17-18)

Nathan Blattau will be in Huntsville, AL in mid-February at the MDA Mission Assurance Conference. He will be presenting a paper on "Strategies for Counterfeit Detection and Mitigation." For more information on this topic, please contact [Nathan Blattau](#).

Photovoltaic Module Reliability Workshop (Boulder, CO: February 18-19)

DfR's Greg Caswell and Craig Hillman in collaboration with the [Indium Corporation](#) will present their Paper on Photovoltaics. If you are interested in learning more about this critical topic, please contact [Greg Caswell](#).

DfR in Boulder, CO (February 19)

Craig Hillman and Greg Caswell will be in Boulder, CO, in February. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

Solar Test and Reliability Conference (Austin, TX: February 23-25)

Cheryl Tulkoff will attend this conference at the end of February. For more information on Solar Test and Reliability, please contact [Cheryl Tulkoff](#).

DfR in Austin, Texas (February 22-25)

Greg Caswell of DfR Solutions will be visiting companies in the Austin, Texas area in late February. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

MEPTEC Chip to System Symposium (San Jose, CA: February 23-25)

Craig Hillman will give a presentation entitled "The Challenges of Co-Design: When Silicon Pushes Packaging Too Far," at the upcoming [MEPTEC](#) symposium. For more information on this topic, please contact [Craig Hillman](#).

DfR in Northern, CA (February 24-25)

Craig Hillman will be visiting companies in Northern California in late February. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

DfR in New England (March 1-4)

[Greg Caswell](#) of DfR Solutions will be visiting companies in the New England area the first week of March. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

IMAPS Device Packaging Conference (Phoenix, AZ: March 7-10)

Dr. Nathan Blattau will give a presentation entitled "The Introduction of Tensile Ratcheting in Solder Bumps Encapsulated in Low Tg Underfill" at the upcoming [IMAPS](#) conference. For more information on this topic, please contact [Nathan Blattau](#).

DfR in Phoenix, AZ (March 10)

Dr. Nathan Blattau will be visiting companies in Phoenix, Arizona in mid-March. If you and your associates are interested in an onsite visit and/or presentation, please contact [Carrie Sharik-Ernest](#).

Wayne Tustin at DfR Solutions (College Park, MD: April 5-7)

Wayne Tustin will teach his popular short course "Random Vibration and Shock Testing, ESS, HALT & HASS" at DfR Solutions, College Park, MD. For more details and reservations, please [click here](#).

DfR in Los Angeles, CA (April 5-6)

[Tom O'Connor](#) will be visiting companies in Los Angeles, California in the beginning of April. If you and your associates are interested in an onsite visit, Please contact [Carrie Sharik-Ernest](#).

IPC Apex EXPO (Las Vegas, NV: April 6-9)

Dr. Randy Schueller will present a technical paper entitled " [Corrosion Impacts from Free Air Cooling](#)" at the upcoming IPC Apex conference. For more information on this topic, please contact [Randy Schueller](#).

DfR in Asia (April 20)

DfR's [Dr. Randy Kong](#) will be in Asia (Shanghai and Taiwan) visiting companies in mid-April. If you are interested in a presentation on Process Reliability Qualification, Component Engineering, or Meeting OEM Reliability Requirements, please contact [Major Chen](#).

SMTA, China East (Shanghai, China: April 20)

[Dr. Randy Kong](#) of DfR Solutions will be presenting " [Manufacturing and Reliability Challenges with QFN Packaging](#)," at the upcoming [SMTA](#) event in China.

Embedded Systems Conference – Silicon Valley (San Jose, CA: April 26-29)

Craig Hillman will present “ [Common Hardware Mistakes by Embedded System Designers](#),” at the upcoming Embedded Systems Conference in April. For more information on this topic, please contact [Craig Hillman](#).

Design for Excellence (DfX) (San Jose, CA: April 19-23)

DfR Solutions, in collaboration [Ops a La Carte](#), is proud to announce that the [DfX training](#) session is back! There was such a high demand for the course on the East Coast that we have decided to add a West Coast location. This one-of-a-kind collaborative effort will provide designers, reliability personnel, and engineering management with tools on how to meet time-to-market deadlines and reduce warranty issues. Areas to be covered include Design for Reliability, Design for Manufacturability, and Design for Testability, just to name a few. For a full schedule of courses and information on registration, please contact [Carrie Sharik-Ernest](#).

Design for Excellence (DfX) (Huntsville, AL: May 17-21)

DfR Solutions, in collaboration with the [University of Huntsville Alabama](#), is proud to announce that the DfX training session is back! There was such a high demand for the course on the East Coast that we have decided to add a South a West Coast location. This one-of-a-kind collaborative effort will provide designers, reliability personnel, and engineering management with tools on how to meet time-to-market deadlines and reduce warranty issues. Areas to be covered include Design for Reliability, Design for Manufacturability, and Design for Testability, just to name a few. For a full schedule of courses and information on registration, please contact [Carrie Sharik-Ernest](#).

Employment

Looking to hire? [Click here](#) to visit the “seeking employment” section of our website where we highlight engineering professionals who are currently looking for job placement.

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