

ARRELIC INSIGHTS

EQUIPMENT CALIBRATION



WHY CALIBRATE?



INTRODUCTION

the need to meet ISO 9001 for quality audit requirements, sometimes well we need to validate the design or manufacturing processes to make sure they're under statistical control or often to make sure that they're within an established system error budget. finally most often in the aerospace defense area will get to know hear people saying they we need to make sure that our Armed Forces never have a bad day each of these is a different use case for instruments.

DESCRIPTION

what you'll see reflects different deliverables and requirements for calibration so throughout the series hopefully we will address all three of these use cases so that you can see depending on where you fit which calibration service and which deliverables are most important to your company now.

Before we jump into calibration I want to cover why do you buy Agilent instruments when you select a particular product you may very well know from our website many of our product lines have lots of instruments this one happens to be spectrum analysers and notice that there are 30 different model numbers so how do you select which model number you want most customers.

Determining those specifications which are critical to your organization and then you look through a table like this one and the model which is least expensive that covers those critical specs is the one that you buy or one above it that's what you do when you buy the instrument our question to you is are you going to rely on those same critical specifications the next year five years later or even beyond that because if you are calibration is really important because the calibration determines the real specifications that you're presently operating to when your instrument is measured .

CALIBRATING THE INSTRUMENT

when we originally built it and shipped it for the first time whenever I'm in person I like to stop and ask the audience this question when you send your instrument into a calibration lab what do you expect them to do this is a fairly comprehensive definition of what calibration is it is the process where you verify instrument specifications by measuring actual performance using external lab standards normally instruments which in turn have better performance and which are traceable to the International System of Units via one of the national metrology Institute's, who themselves are signatories of the mutual recognition agreement.



SPECIFICATION



• you know if you're a metrologist you probably agree with everything I said and that's completely correct but there's a lot of folks out there who would say wow that was a bit much so I want to show you a much simpler operating definition which isn't quite as complete but which covers the main elements and here it is this is how we define it at Agilent we measure the actual performance of every warranted specification for every installed option and we do that every time every spec every option every time real simple to remember that's how you know that your instrument is still operating like it did when we shipped it to you now this is a good point to mention cautionary note and that is if you're being offered functional tests a functional test does not test the actual performance of all of those measurements that's how you do calibration as part of the new product introduction for every new instrument we develop a series of performance tests and these are designed to measure the actual performance of all of the warranted specifications so here you see an example for one of our high performance spectrum analyzers and you'll see that depending on which model there's over 40 different performance tests

what I'd like to do now is we're going to run through a little series and you're gonna see on the upper line some measurements at Agilent did and this is an actual comparison where there was another lab that also measured this RF signal generator so where everywhere you see a green dot it means that's an actual measurement that was performed the important thing to note here is suppose your company is depending on the specification you bought that instrument from that earlier chart that I showed and you bought it on the basis of any of the specifications that are inside the yellow oval in this case those were not measured so you don't know that's why at Agilent we feel it's important to measure every speck every time now everybody in your company contributes to the overall success of your business who in your company is responsible for measurement if you're listening to this and you're responsible for measurement part of that responsibility is to find out more about calibration get involved and you can trust but make sure you verify that the specifications that your company counts on are being measured accurately during calibration now what I'd like to show you is when I said trust but verify how do you do that you can do a sample audit

VALIDATION PLAN

About equipment let's call it validation calibration maintenance so the village to address this is as you can see from an outline perspective I want to begin with validation now as we cover all these topics specifically validation let me kind of offer an apology so to speak which is to say that you've probably seen online and in-person webinars and seminars that deal exclusively with the validation process and these seminars and webinars can last up to multiple days as you can see we have an hour here so while a community can give you specific examples and ideas and suggestions

remember that this is kind of a cursory and very slightly detailed examination of all these characteristics so having said that we're going to begin with the cotan validation then we'll cover calibration under calibration I do want to mention using calibration standards many companies just are you know from a reflex perspective send their equipment out to be calibrated it's not necessary that you do that most but a little while talking about that remedial action for added calibration equipment you have a piece of equipment it's out of calibration what you do then we'll talk about so in a few minutes speaking about calibration

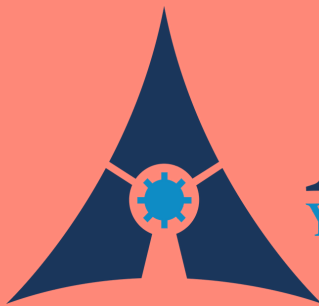


WHAT YOU NEED TO LOOK AT?



a little bit of detail operation qualification and performance is it installed does it operate in to what extent and can you repeatedly make product off of it the question when it comes to installation qualification it's really nothing more than is this piece of equipment this sealing machine or packaging machine or sonic welder is this piece of equipment installed correctly and what you're going to have to do to determine this is you're going to have to ask yourself some questions you're going to have to establish some parameters specifically what are the design features of this piece of equipment then you have to look at installation conditions are there any requirements for specific wiring deceased equipment need to be wired into your current system or can it merely be plugged in what kind of utilities or venting implications are there from your utilities perspective is it you know is it what kind of voltage does it put out from the venting perspective is it something that it released exhaust

MACHINE THAT'S USED TO SEAL POUCHES WELL THIS PIECE OF EQUIPMENT IS MORE THAN LIKELY GOING TO BE USED IN A CONTROLLED ENVIRONMENT OR EVEN MORE SO A CLEANROOM



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About Arrelic

Arrelic is a fast-growing deep-tech firm aiming to bring the next level of IoT based sensor technology to transform the mode of manufacturing operation and maintenance practice of various industries with extensive expertise in Reliability Engineering, Predictive Maintenance, Industrial Internet of Things (IIoT) Sensors, Machine Learning and Artificial Intelligence. We provide a single ecosystem for catering all industry needs from Consulting to IoT and Analytics as well as providing Training and Development courses for different stakeholders. We aim to help manufacturing industries to improve their overall plant productivity, reliability and minimize total production cost by 25-30% by eliminating machine downtime, lightening management decisions by analysing the machine data with right mind and expertise; for a worry free operation.

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www.arrelic.com

info@arrelic.com

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