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NCAB Group delivers the premium quality you cannot always see



To maintain total focus, personnel assigned to inspecting PCBs take regular breaks.

PCBs from the NCAB Group deliver a quality level that can more than pay for itself over time. With an industry unique product specification that sets exceptional standards and stringent quality control, combined with a high level of purchasing power, ensures the factories do adapt to achieve the NCAB Groups requirements.

At first sight, PCBs differ little in appearance, irrespective of their inherent quality. It is under the surface that we find the differences so critical to the PCB's durability and functionality during the entire life cycle. Even though you can not always see the difference, NCAB puts a great deal of effort into ensuring that their customers are supplied with PCBs that meet the most stringent quality standards.

"It is vital that PCBs function reliably both during the customer's manufacturing assembly process and out in the field," says Kenneth Jonsson, Technical Manager at NCAB Group Sweden and continues, "Remedying faults that occur during assembly can be extremely costly. There is also a risk that such faults can end up being built into the final product via the PCBs. It may take years before they are discovered, with possible failures in the field leading to substantial

compensation claims. Relative to this, it would be reasonable to suggest that in many instances, the cost of a premium quality PCB is negligible."

It may not matter so much in the case of white goods & basic consumer electronic items, but in just about all other market sectors, particularly those manufacturing products with critical applications, the consequences of any failure will be devastating.

NCAB Group CEO Hans Ståhl, underlines the importance of always considering the total life cycle cost when comparing PCB prices. "Reliability and a guaranteed, or long life cycle might involve an initially higher outlay, but will pay for itself in the long run," he says.

COMPETENCE, PURCHASING POWER AND CONTROL

Many PCB users lack the experience needed to draw up appropriate specifications for their PCB requirement. With companies increasingly outsourcing their manufacturing, they often lose the in-house skills they once possessed and that are required to make professional assessments when ordering.

“It is also a matter of ensuring that manufacturers really do listen to your demands. You need purchasing power to persuade a factory to comply to a detailed and extensive list of specifications,” says Kenneth and underlines that if a buyer lacks the volumes, it can be difficult to get anyone to take on the job. “At worst,” he adds, “they might just ignore the requirements set.”

The NCAB Group has both the necessary competence to make the appropriate demands on the factories, as well as the purchasing power to make sure those demands are met. This is backed up by an extensive organization in China and at the factories, who closely monitor all elements of factory performance & conformance.

“It is extremely important to ensure compliance and monitor the quality of the product. All of our factories are initially put through a comprehensive & rigorous approval process before we can start using them. We introduce controls that ensure our demands are being met on a continual basis. Using industry specific process & test equipment, we also evaluate the manufactured PCBs against many different criteria,” says Hans Ståhl.

NCAB GROUP'S OWN STRINGENT PCB SPECIFICATION

Specifically, the NCAB Group guarantees quality by applying an extensive product quality specification, compiled in-house, which sets the standard for all PCBs supplied by NCAB. It is based on normal IPC standards, but goes even further by placing more stringent requirements in a number of areas.

“What we have here is a 31-page document, that builds on our long-term experience of PCB construction,” Kenneth Jonsson explains.



Cathy Wang, Quality Engineer in the NCAB Group Factory Management team, seen here with Xu Hua, Drilling Department Supervisor at AKM, during an audit.

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HANS STÅHL, CEO, NCAB GROUP



NCAB requires high standards of cleanliness, e.g. as seen here in the construction of multilayers prior to pressing.

For instance, NCAB makes more rigorous demands on the thickness of plated through hole copper. Thicker through hole plating ensures that each PCB can much better withstand, the effects of soldering, potentially avoiding the risk of material fatigue which can ultimately lead to intermittent faults at a later date. NCAB also demands higher standards of cleanliness on finished and delivered PCB's, it is a well known fact that contamination on the PCB can cause short-circuits during and even after assembly, often leading to expensive rework or replacement.

"Of equal importance, we impose strict requirements on solderability and on the type of surface treatments which may be applied. In this respect, today's buyers often have limited knowledge of what really works. We carry out extensive tests – for instance, we simulate the ageing process on some finishes to see if they will stand the test of time," says Kenneth Jonsson.

Any factory selected by NCAB as a manufacturer is required to use specific laminates and solder masks.

"Even when specifying the widely accepted industry standard green resist, we have to consider all aspects of the material supply chain in that we have actually seen some non NCAB Group approved factories that have used inferior and in some instances, fake or pirated solder resists & colour pigments," Kenneth Jonsson explains.

FEWER CLAIMS

NCAB Group also places stringent demands with regard to the kind of repairs that may be performed.

"Once a PCB has been repaired, you have to be prepared to face reliability issues sooner or later. It is generally far better to get things

THE NCAB GROUP'S THREE STEPS TOWARDS ACHIEVING QUALITY

- 1. NCAB's own PCB specification, based on the IPC standard but going beyond this in many crucial areas.**
- 2. Sufficient purchasing power ensures that PCB manufacturers really do embrace & manufacture to our expectations.**
- 3. Extensive compliance control on site in the factories, as well as follow-up quality control of the manufactured products.**

right from the start; that's something we always emphasize," says Kenneth Jonsson.

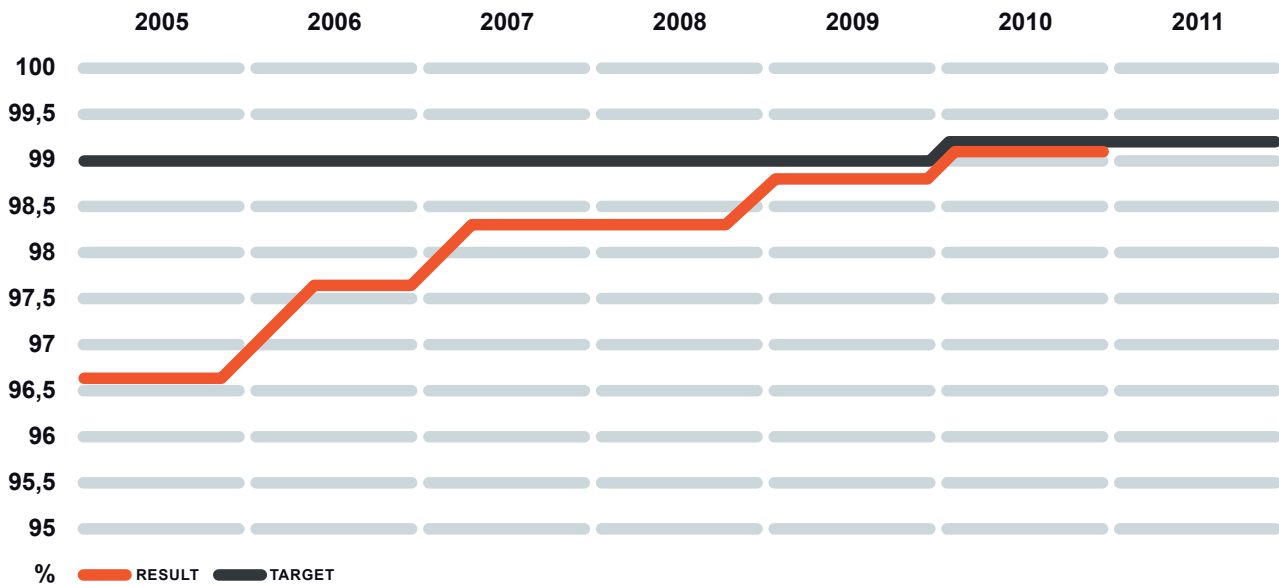
As mentioned, NCAB follows up its specification requirements with rigorous on-site control in the factories, as well as controlling the quality of the PCBs after production.

"Our efforts in this respect are reflected in the number of claims we get. The number of claims we've been getting has been steadily falling for some time now," Hans Ståhl adds.

NCAB is careful not to let their higher level quality demands hinder progress, and with close attention at all stages of supply, ensure that customers are kept fully updated at all stages of production.

"The specification has to be dynamic. For instance, when one of our factories wants to introduce a new product, we are willing to evaluate it; otherwise, there's a risk that the manufacturing methods we require will eventually become outdated. This is just one of our responsibilities as suppliers, to keep up with the times," Kenneth Jonsson concludes.

BETTER QUALITY YEAR AFTER YEAR



As part of NCAB's quality assessment, the number of order lines resulting in complaints are compared with the total number of order lines delivered.



A WORD FROM OUR CEO

Strong growth secures quality PCBs

The NCAB Group is experiencing an unprecedented period of growth, very much thanks to our efforts in Europe. The newest member of our group, NCAB France, with its staff of three, has got its operations truly up and running and has already expanded its customer base. The same can also be said of the UK. Spain continues to perform well, despite operating in the midst of a deep economic crisis. With the recent appointment of a Key Account Manager in northern Germany, our German company can now offer specialist customer services in every region and our Russian company is doing extremely well, with our concept really starting to pay dividends in that vast market.

NCAB's growth greatly benefits its customers, since it enables us to improve the quality of our products. This reasoning might need some explaining, since you may well ask what high turnover has to do with quality. You will find the answer in the NCAB Group's 31-

page PCB standard specification, which you can read more about in this newsletter. This document serves as the blueprint for all of our PCBs, irrespective of where they are produced. Essentially, it requires our factories to adapt their processes to our specific demands. To persuade them to do this, the volumes we order have to make up about 20% of each factory's turnover. Strong growth and purchasing power are crucial to get this equation to work. Large volumes also enable us to employ more specialists to closely monitor the factories' performance and ensure compliance.

So we will continue to focus on growth, irrespective of the economic situation. History has shown that we actually gain market shares in times of recession, so despite the storm clouds on the horizon, I am confident that the NCAB Group will continue on its road to success.

Hans Ståhl CEO, NCAB Group