

A large, white, stylized graphic element resembling a downward-pointing arrow or a bracket, positioned in the upper left corner of the page.

#32013

INFOCUS:



High product mix

- A trend that puts high demands on the factories

During the past ten years the quantities of PCBs on purchase orders placed with PCB manufacturers have gradually lessened, while the number of different designs per order have increased. This has come about as a result of shorter product life cycles, customers' need for greater flexibility, more rapid time to profit and a reluctance to tie-up capital. This trend is becoming more pronounced each year, with the entire supply chain now having to adapt, this applies to systems, as well as the choice of factories.

High-mix manufacturing puts special demands on a PCB factory. The main board manufacturers are geared towards producing large volumes of identical PCBs and cannot handle this type of production in a cost-efficient manner, without it negatively impacting on their high-volume production processes.

"We always work directly with the factories and strive to maintain at least 30% dedicated manufacturing capacity at each main factory. Our buying power and leverage thus enables us to exercise considerable influence in their production processes."

JENNY ZHANG, HEAD OF NCAB'S SOURCING DEPARTMENT, CHINA

Of approximately 1600 PCB factories in China, only one in ten specialise in high-mix board production. NCAB handles over 12,000 different designs every year and currently use 8 different factories that specialise in high mix production.

"We have the know-how and the experience. We know what is required for a factory to be able to operate on this basis and deliver the right quality. We are also fully familiar with our customers expectations and requirements," explains Jenny Zhang, Head of NCAB's Sourcing Department in China.

Jenny Zhang and her colleagues at the office in Shenzhen are all well versed in the intricacies of the PCB industry and are continuously striving to find more factories that can meet the stringent demands of the NCAB Group.

"We always work directly with the factories and strive to maintain up to 30% dedicated available manufacturing capacity at each main factory. Our buying power and leverage thus enable us to exert considerable influence in their production processes," concludes Jenny.



FMOS enables all NCAB employees across the world to keep track of NCAB's PCBs in the production chain - in real time, thus enabling them to act proactively. Martin Magnusson, Vice President, NCAB Group

ALSO SUITABLE FOR MAJOR MANUFACTURERS

Today, even the major electronics companies are having to handle a wide variety of designs, since their high-volume customers also

produce low-volume products.

"The important OEM and EMS companies would find it advantageous to turn to us when they need help to handle a large number of different designs," says Martin Magnusson, Vice President at the NCAB Group.

As a rule, the high-volume factories utilized by these large companies find it very difficult to handle high-mix production and are not geared for it, neither in terms of equipment nor competence.

Martin Magnusson emphasizes that, at the end of the day, asking your regular high-volume factory to provide you with a low-volume item can turn out very expensive, both in terms of time as well as actual cost. It would be far better, he says, to take advantage of the competence, capacity and service of a player who is at home with this type of production.

EFFECTIVE COMMUNICATION

Communication is a crucial component for successful high-mix production. Since NCAB is close to its customers, in their local market, the company can provide the necessary skills, support and answers directly.

One of the parameters introduced to increase NCAB Group's efficiency in the supply chain was the launch of the FMOS or Factory Management Operating System, whereby all NCAB employees across the world can keep track of NCAB's PCBs during manufacture in real time, thus enabling them to act proactively.

A company that has discovered the advantages of having the NCAB Group as suppliers of PCBs with a high product mix are UK based Bassett Electronics Systems Ltd, an EMS manufacturer of control systems for drink and snack machines, agricultural and audio equipment. Bassett order £250,000 worth of PCBs annually and handle 20 to 30 different designs every month. This business model builds on manufacturing lead times of six weeks for low-tech products and eight weeks for more complex boards.

"The NCAB team in the UK provides an excellent service. They price their PCBs appropriately and we can rely on them to deliver on time, which is crucial for us. Generally, we require 15 days delivery of PCBs for our low-tech products and 20 days for more complex boards," says Cliff Smith, General Manager at Bassett.

CAREFUL FOLLOW-UP OF FACTORIES

The strong reputation the NCAB Group has built up as a highly reliable partner stems from its strategy of working exclusively with factories under the best professional management and building close relationships with these factories. NCAB's Factory Management team works closely with the factories so as to further refine their operations.

NCAB staff pay daily visits to the factories, with a mini audit being carried out once a month on a specific process, which is then followed up the month after. Once a year, a major audit is carried out which involves the review of all of a factory's processes and establishes a plan of action, which is then followed up.

"We believe in transparency and openness towards both our customers and our factories," says Jenny Zhang. "Customers can see what the individual factories have been manufacturing and can visit them themselves. We also translate our customers demands and expecta-

tions very clearly to our factories.

"A factory is subject to a careful quality assurance process that can take at least six months to access and includes audits and training of the factory workforce. In order of priority, the most important demands placed by the NCAB Group comprise quality, lead times/precision, service and price. When it comes to factories geared to high-mix production, the benchmark applied requires them not only to be equipped with the appropriate tools and have a high ratio of engineers among those employed at the factory, but also to keep a comprehensive and varied stock of parts and materials."

Jenny Zhang feels that we are going to see an increase in high-mix production capacity within the Chinese PCB industry, triggered by market demands.

"When this expansion takes off, more and more factories will set up separate production lines specially adapted to market needs. At NCAB, we will continue our efforts to bring in more factories that can live up



Jenny Zhang and her colleagues at the office in Shenzhen are continuously striving to locate more factories that can meet the stringent demands of the NCAB Group.

to our stringent demands. Right now, we're in the process of approving two or three new factories." Jenny concludes.

Questions around the world: What is the demand like for high mix PCBs in your market? How would you describe your customer's expectations/demands as regards PCB manufacturers in this area?



DENMARK

HENRIK DAMGAARD JENSEN

KAM, NCAB Group Denmark

"The demand for a high product mix is growing in Europe. Customers want the highest quality, reasonable and reliable lead times, smooth communication, broad technical competence and good control within CSR. Within this area we also find a broad spectrum of varied technical and commercial requirements. To meet these, it is vital the PCB supplier has a strong organisation and extensive know-how."



USA

JOSEPH HELMS

Vice President, Marketing and Sales, NCAB Group USA

"The core business at NCAB Group USA is the high-mix, low-volume PCB Market. We provide these customers with local customer service, support and engineering. We work closely with the NCAB Manufacturing Team in China and our factory partners to insure that jobs run smoothly. We inspect all products to IPC, Customer & NCAB Specifications. Given that we're structured to efficiently manage a high product mix, we love lots of part numbers!"



UK

HOWARD GOFF

Managing Director, NCAB Group UK

"For NCAB UK, these orders represent more than 70% of our order book. Our customers need quality, delivery and price consistency. NCAB Group tool and manufacture thousands of such parts every month and only with factories specializing in high mix production. With better than 99.3% on time delivery into the UK, as well as the cost and reliability benefit of being one of Europe's largest importers of PCBs, this clearly delivers the lowest possible total acquisition cost to our customers."



What is expected of a factory?



MORE ENGINEERS

"In factories that specialize in high-mix product manufacturing, the proportion of engineers in relation to other factory personnel is far higher than in high-volume factories," says Jim Liu, Factory Supervisor Manager at NCAB Group China.

"You would find about 300 engineers at a high volume factory with 10,000 employees, that's approximately 3% of the workforce. A high mix factory with 1000 employees would employ the same number of engineers, in other words 30% of the workforce."

Jim emphasizes the need for manning such a factory with a large number of engineers to enable them to tackle technical and quality related issues, as well as respond rapidly to customers.



"You'll find about 300 engineers at a high volume factory with 10,000 employees – approximately 3% of the workforce. A high-mix factory with 1000 employees would have 30 % engineers in its workforce," says Jim Liu, Factory Supervisor Manager at NCAB Group China

MANY CAM STATIONS

Another parameter when assessing a factory is the number of CAM stations adapted for high-mix production. The norm at

NCAB's factories is 40 such stations in a factory with a turnover of 24 million Euros.

FLEXIBLE PRODUCTION LINES

There is little or no difference in the basic process for manufacturing high or low volume PCBs. The difference lies in the flexibility of the various machines on the production line, as well as its management.

Machines in a factory environment adapted for high-mix production are designed with high flexibility and very fast setup times in mind. For example, the drilling machines are fitted with just two spindles instead of six. The various chemical processes/lines are also narrower in a high-mix production environment. And the factories are not automated to the same degree since setup time has to be kept to a minimum.

The organisation is somewhat different. It includes more personnel with a higher degree of competency and flexibility, who are able to man the different and varying processes in a manufacturing environment steered by short runs.

"Most high-mix projects involve short lead times and many batches in production. That's why flexibility is important, as is the ability to quickly setup production of a new PCB batch.

Any acute issues that turn up in this type of production need to be immediately dealt with so as to avoid delays or chaos," says Jim Liu.

SYSTEMATIC FOLLOW-UPS

In order to properly manage a large number of designs in a production process, the factory has to have an efficient ERP system. This enables all the batches to be continuously followed up during production.

A changing world

HANS STÄHL
CEO NCAB GROUP




The trend that this newsletter has focused on is a very distinct one. The reason behind the growing demand for high product mix PCBs is that consumers have become increasingly inclined to buy the latest models of, for example, mobile phones, cars, computers and so on and so forth. Soft and hardware manufacturers are therefore having to continually launch new products in order to survive. In practice, this means that the entire manufacturing chain has to be much more efficient in order to achieve faster time to profit, as well as reductions in working capital.

The NCAB Group has responded to this trend by continuously

improving both our factories' and our own processes in order to attain a more efficient information flow. FMOS (Factory Management Operating System) is the latest tool we have developed in that direction. It keeps all NCAB Group companies updated, in real time, on the status of all our PCBs in the production chain.

To create an efficient flow in high-mix production, we need to first and foremost collaborate with appropriate factories with local follow-up. Another prerequisite is being close to the customer, since with this form of production, you need to arrive at quick decisions to solve issues such as changes in design or delivery terms.



Bassett Electronic Systems Ltd are specialists in the design, manufacture and assembly of PCBs

» [Bassett Electronic System Ltd](#)

Subjects we have covered earlier



Do read our earlier newsletters. You will find them all on our website, www.ncabgroup.com/newsroom/

» **Prototype manufacturing**

2013 06 11 | NEWSLETTER 2 2013

» **Russia in from the cold**

2013 03 26 | NEWSLETTER 1 2013

» **Looking to the future: Western Europe**

2012 12 19 | NEWSLETTER 4 2012

» **The American market**

2012 10 24 | NEWSLETTER 3 2012

» **Reforms**

2012 06 25 | NEWSLETTER 2 2012

» **Sustainability**

2012 04 05 | NEWSLETTER 1 2012

Are we taking up the wrong subjects?

We are always looking for interesting subjects that we could take a more in depth look at.

If there is something you would like to learn more about, or perhaps you would like to comment on anything we have written, do get in touch with us and tell us more.

Mail: sanna.rundqvist@ncabgroup.com