



This is SMT

● In short, SMT (surface mount technology) can be described as the main technology today for assembling electronic components on circuit boards. The components are soldered onto the surface of the circuit board, unlike the old and more space demanding method where each component had metal pins which were brought through holes in the circuit board and soldered onto the backside. The advantage with SMT, among others, is that it's a faster and cheaper method. Furthermore, components can be mounted on both sides of the board, which saves a lot of space.

Impressive machines. *Assembléon's pick & place machines are extremely flexible in order to meet today's demands of the electronic industry. They manage a vast amount of board sizes and can be loaded/prepared with more than 200 rolls of different components.*

Assembléon reaches maximum reliability with Gore cable

Jef Horijon, systems architect at Assembléon, the Netherlands, is certain he's right: "I'm convinced that this is the best cable in the world for this application", he states.

The honourable words concern a custom-made FireWire-cable from Gore – developed with the ambition to last through at least 1,200,000,000 rolling flex cycles without any effects on the signal quality.

ASSEMBLÉON IS A 100% affiliate of Royal Philips Electronics, based in Eindhoven, the Netherlands, where Philips was founded more than 100 years ago. The company manufactures advanced pick & place machines, which are used for the assembly of electronic components on printed circuit boards. Their products are absolutely among the best in the world. The company has thorough experience of SMT (see box) since Philips

has been around since the technology was young more than 25 years ago.

Today, the machines of Assembléon are used all over the world for the manufacturing of circuit boards in industries ranging from toys to automotive. The machines are running around the clock, picking and placing components which sometimes are so small that only sharp-sighted people can see them with the naked eye.

THE SPEED IS ENORMOUS. The fastest machines can place 150,000 components per hour. When the accuracy at the same time is about 40 micrometers, one understands that this is about sophisticated technology, especially since the machines shouldn't be affected by unexpected stops.

"Our customers must have machines that work. Reliability is their main demand. If the machine stops, it might disturb their production, which of course will strike back at us," says Jef Horijon,



Rene Malfait, purchasing manager and Jef Horijon, systems architect.

systems architect at the development division of Assembléon.

The demands of precision and speed in the SMT industry are ever increasing. The pick & place machines must run faster, and at the same time be able to handle smaller and smaller components with increasing accuracy.

This precision is secured with optical surveillance. In the most advanced machines, every robot arm is equipped with a camera which communicates with a computer that controls the positioning of the component. The signals between

the camera and the computer is transferred via a FireWire-cable. This is where Gore comes into the picture.

THE MAJOR CHALLENGE with this cable is that it must manage a monotonous movement in almost an infinity without the signal quality being affected. When the robot arm moves, naturally the cable does too, performing a rolling flex motion. To secure the reliability in this type of machine, Jef Horijon and his colleagues at the development division at Assembléon, looked for a cable that should be able to manage at least 1,2 billion of those movements – with an exemplary signal quality kept.

"Many suppliers were tested, but no one could meet the demands. The problem was that the signal quality was affected much too quickly. Finally, we decided to begin a cooperation in development with Gore," says Jef Horijon.

AFTER SEVEN MONTHS of fault finding, repeated modifications and a number of tests, the goal was reached.

"It was a long and successful process. We challenged Gore at every step and questioned every modification that was done to the cable. We wanted

proof that we were really on the right track. And we got it. Through the entire process, Gore listened very carefully and we got good answers to all our questions."

The result is a cable which exceeds all expectations. Exactly how long the new cable will last nobody knows – yet. A lifetime test was set up when the cable was fully developed in August 2005. When Signalen visits the development division at Assembléon in August 2006, the cable is still in the test bench, being dragged back and forth in a rolling flex motion with no sign of wear. Next to it, there are some cables of other makes. They are torn off and tattered.

"I can only state that the collaboration with Gore has given us exactly what we needed. I honestly didn't believe that we would reach such a good result. It's really incredible," says Jef Horijon.

The purchasing manager Rene Malfait fills in with another important factor in the context:

"When the development work is done, it's also necessary that the delivery accuracy is high. We always get quick notice from Gore as of when and how many cables we can get. And they are here on time, too," he says.

JÖRGEN ANDERSSON



The machines are equipped with several placement robots. Each with its own camera to guide component placement.