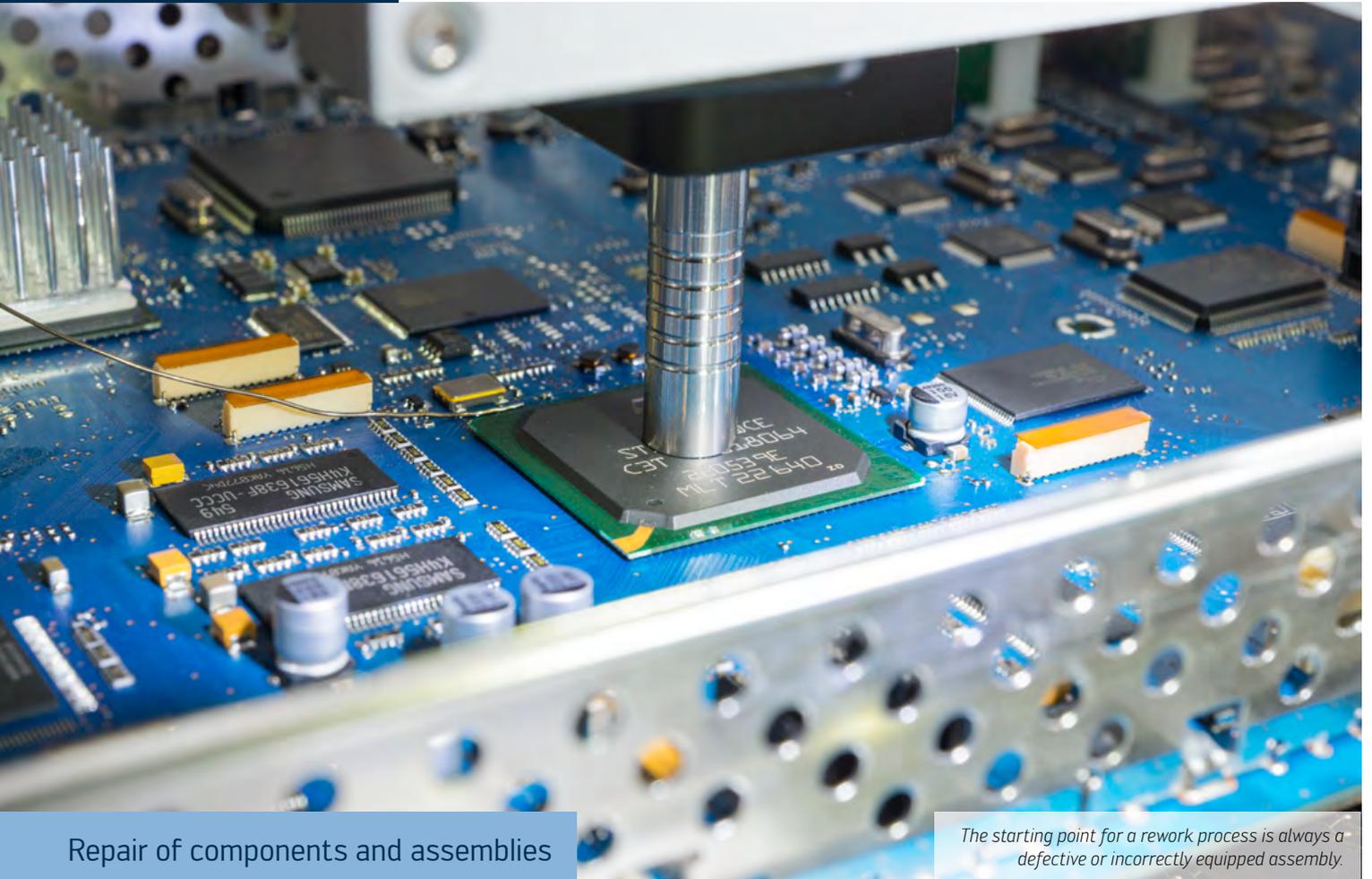


## Technical article



Repair of components and assemblies

*The starting point for a rework process is always a defective or incorrectly equipped assembly.*

# Added value through proper repair

In a perfect world, there would be no faulty components and therefore no repair of assemblies. However, companies need to develop good rework and rework strategies in order to obtain the added value of the increasingly complex and

widespread electronics along with their end applications. This means that faulty assembly groups are functional again and resources are spared. The examples show the approach of a professional repair of assemblies.

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*Hybrid rework system – automatic desoldering, placing and soldering of SMT components.*

The starting point for a repair or rework process is a defective or incorrectly equipped assembly group, about which as much information as possible should be available. Which components have to be replaced and which thermal specifications do they have? Which solder was used for soldering, which other materials (underfill, conformal coating, flux systems) were or are used? What is the composition of the assembly, are there sensitive components next to the target one or on the bottom side of the circuit board? Do any further requirements exist? The more we know about the task, the easier the successful repair becomes.

#### CHALLENGING REWORK TASK

LGA bases are widely used and are a challenging rework task due to their complex mechanics. The components are large and comparatively heavy. An LGA 775 for example must have a lid to be picked up by a vacuum nozzle for desoldering or placing.

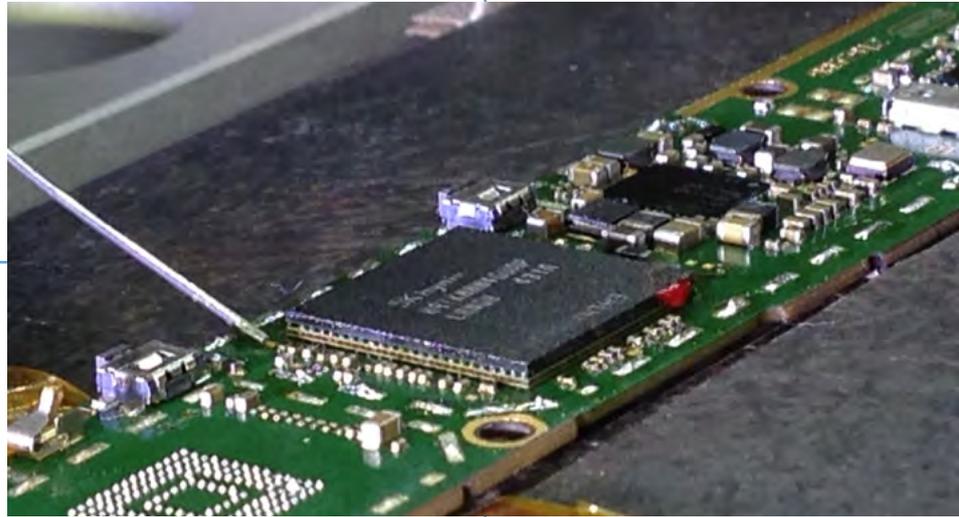
Due to the high component mass, good preheating and further heating of the circuit board from below is important. Hybrid rework systems are well suited for soldering these components, because they do not require component-specific nozzles. The energy is transferred to

the component by means of infrared radiation and a convection part. The base is evenly heated and soldered. Particularly important for these components is the homogeneous application of solder paste or flux using the dip-in process. If the component is dipped into a defined paste depot, each solder joint receives the same amount of flux or solder. This is an important factor for a successful installation, especially for high-pole components.

#### GENTLE AND CONTROLLED HEATING

Modern SMT LEDs are high-performance components with repair-relevant characteristics: The soldered connection must be of high quality, since lighting applications are often exposed to strong climatic fluctuations. In addition, voids, the inclusions in a solder joint, can reduce heat transfer and thus the service life of the LED. Some LEDs have sensitive optical surfaces (lenses) which must not be damaged during repair. Rework systems from Ersa heat up LED assemblies gently and in a controlled manner. Ersa advises its customers worldwide and has built a growing knowledge base of known and solved rework applications. By doing so, customers are always informed about the latest state of the art.

Package-on-package rework with the hybrid rework-600/2 workplace



## DEMANDING REWORK

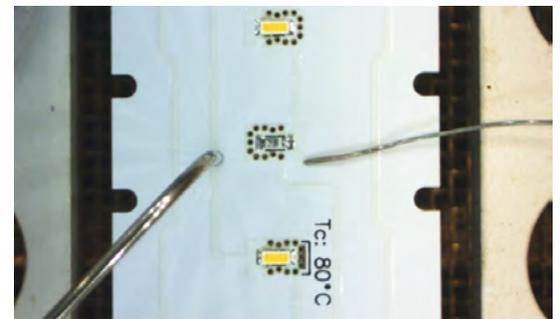
The repair of components (stacked components, package on package) is one of the most challenging applications in assembly rework. The stacked components can be processed in different ways: Either all layers are soldered at the same time (gluing the edges with SMD adhesive), two layers are placed simultaneously (adhesion when placed with flux or solder paste) or individual layers are desoldered.

For successful rework it is important to accurately measure the temperature on the component. Even for this application the balance between heating from below and above is an important factor. Thus it is possible to desolder only the upper layer, if the energy input is mainly from above. When installing new components, it is possible to make two layers adhere to each other by applying solder paste or flux and place them together. In the subsequent heating process, both layers are soldered in.

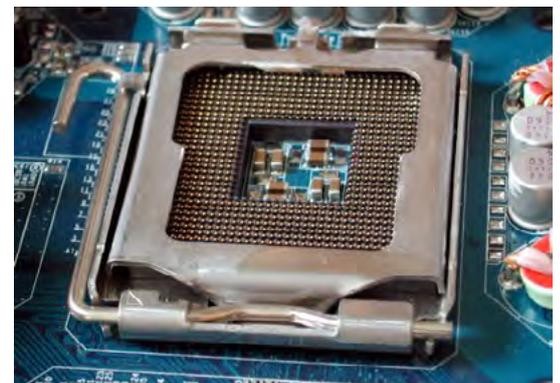
Rework systems such as the HR 550 and HR 600/2 support the user during the repair. Standard soldering and desoldering profiles make it easier to find the right temperature settings for each application. Sensor-based temperature control ensures process reliability and IR and hybrid heating technology ensures a gentle heating processes. Precise component alignment and the defined application of flux via dip-in or print processes ensure that the target component is optimally prepared for the soldering process.

## KEY DATA

Kurtz Ersa North America received two NPI Awards at the IPC Apex Expo trade show. The system supplier for electronics production received awards in the categories "Repair & Rework" for its rework system HR 550 and "Selective Soldering" for its flexible soldering module VERSAFLEX. The awards were handed over during Apex, which took place at the San Diego Convention Center from February 14 to 16, 2017. ■



SMT-LEDs are high performance components with rework relevant properties



The LGA 775-processor base represents a complex rework task



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