User report | Best practice

Rework out of the box!
Ersa hybrid rework system HR 200 – this is how simple rework can be these days.

Maintain values, minimise rejects, avoid electronic scrap

Repair is Back!

Repair is back! – this slogan summarises the current development not only in the field of assembly repairs. In broad areas of European society, people are becoming more and more conscious of the importance of using the finite resources of this one, unique planet earth more intelligently. The General Director for the Environment in the EU Commission, Daniel Calleja Crespo, summed the situation up in his closing speech at this year's Circular Economy Stakeholder Conference as follows: It is true that we have discovered other planets similar to earth, but until we are ready (… to be able to use them …) we have to manage with the one earth we have!

Author
Jörg Nolte
Product Manager Tools, Rework and Inspection
Ersa GmbH

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THE SIGNS OF THE TIMES ARE "PRO REPAIR"

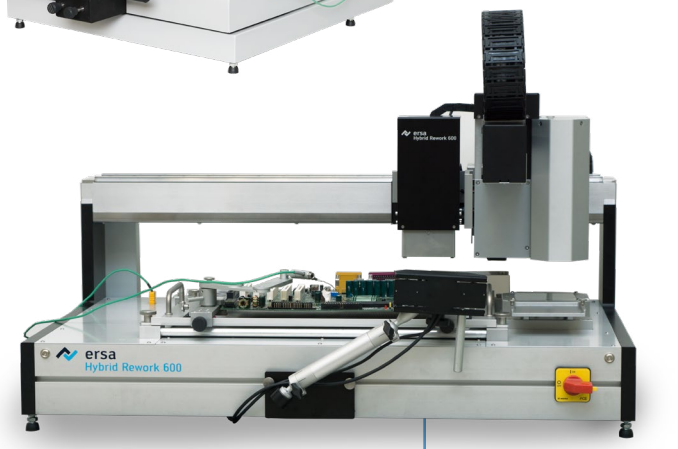
In line with this statement, the European Economy and Social Committee (EWSA) and with it the European Commission has issued various reports demanding the avoidance and reduction of electronic scrap. The useful life of products should be extended. Thus the EWSA advises manufacturers in its "Product service life and consumer information" report to make repairs to their products easier.

The amendment to guidelines (RoHS and WEEE) aims to reduce pollutants in products even further and to recover materials. They are accompanying us on our journey from being a throwaway to a circular economy. The EU Commission is even supporting new business models in connection with processes in the circular economy and intends to create further jobs in this sector. Other private organisations such as Repair Cafés (www.repaircafe.org) are picking up on the initiative and offering everyone help with repairs to a wide range of different products from daily life. Some manufacturers have already recognised the trend and are offering durable and repair-friendly products such as the Fairphone 2.

REPAIR OF ELECTRONIC ASSEMBLIES

Within the context of assembly production or repairs of electronic products, it is mainly economic interests that motivate companies to repair their boards or systems rather than disposing of them. During the production of electronic components, rejects occur again and again despite constant efforts. Faulty components, insufficient solder paste printing or faults in component equipping can never be completely avoided. In many cases, it is little things such as jumpers, an open solder connection or wrong resistor or capacitor that prevent an assembly from working properly. In order to maintain the value of the produced assemblies, it is worth using professional and qualified repair processes. In this sector, Ersa offers its customers all over the world a balanced package of products and services related to repair soldering. The portfolio ranges from the low-cost entry-level soldering station i-CON PICO for ambitious repair solderers through the professional multi-channel soldering and desoldering station i-CON VARIO 4 with four different soldering tools to partly and fully automatic rework systems. In addition, the Wertheim-based soldering specialist offers soldering training (www.avle.de) and seminars in order to guide users to a successful soldering result.

Ersa HR 550 hybrid rework system – top-level rework with computer-supported component alignment during positioning.



Ersa HR 600/2 hybrid rework system – automatic desoldering, positioning and soldering of SMT components. Flexible and safe.

BGA REPAIRS IN JUST A FEW MINUTES

Integrated components can only be soldered and desoldered using classic manual soldering tools to a limited extent. In the case of SMDs with concealed component connections (BTC), the use of a rework system is essential in order to remove the faulty microcontroller safely from the board and solder a new one in its place, for example. In the most straightforward case and up to a component size of approx. 30 x 30 mm, this repair can be carried out using the Ersa hybrid rework system HR 200. The

Finely dosable volume flow with the hot air soldering/ desoldering irons i-TOOL AIR in the Ersa i-CON VARIO soldering and desoldering station.

assembly is preheated using an IR heater from below. A 400 W hybrid overhead emitter provides the specific preset soldering energy from above. Depending on the board and presetting, such a soldering process takes between one and three minutes.

The most well known component in professional repairs is the BGA (ball grid array). These components often present a challenge, particularly when production for a new product starts. Thermally imbalanced solder profiles, component features or aspects of the board or auxiliary materials produce faults during the processing of BGAs. Soldering faults on BGAs can only be discovered with the aid of X-ray systems or optical inspection using the ERSASCOPE. In addition, these components are usually comparatively expensive and are used in complex, high-grade electronic circuits. This makes successful repairs all the more attractive. Here, the Ersa rework systems HR 550 and HR 600/2 are used. They offer partly automated or fully automated desoldering, positioning and soldering processes for BGAs and practically all other SMD designs. Thanks to the temperature control in the closed loop control circuit, a soldering result comparable to the series process can be achieved on every assembly during the first process.

The ZVEI (German Electrical and Electronic Manufacturers' Association) recently reviewed the quality of assembly repairs as well. The results for correct repair work were published in the Guidelines – Rework of Electronic Assemblies. The guidelines intend to show customers as well as manufacturers possible process limits and process specifications for the rework of electronic assemblies. It is thus a helpful document for a successful rework strategy.

REWARDING SIDE EFFECT: AVOIDANCE OF ELECTRONIC SCRAP

Highly developed process chains and specialised companies for the recycling of electronic scrap do now exist, but the methods used require a lot of energy, need special materials (metals) to be used and always leave an unusable residue behind. In addition, the mountains of electronic scrap being "further processed" in Asia and Africa under extremely questionable conditions have hardly been reduced.

Accordingly, repairs not only offer advantages in terms of cost, they also help to reduce the volume of rejects and thus avoid electronic scrap. Repairs are a creative process and make people feel happy. If the way of thinking of earlier generations – that things are worth repairing – becomes the norm again, this will go easy on the energy and material resources on planet earth. The five buzzwords of the "Zero Waste" movement: refuse, reduce, reuse, recycle and rot may thus be supplemented by rework. ■

Ersa i-CON 4 – operate up to four repair tools using one station. From the extremely fine soldering/desoldering tweezers through THT desoldering irons, hot-air irons to i-TOOL and HIGH POWER soldering irons

Ersa GmbH
Leonhard-Karl-Str. 24
97877 Wertheim
Phone: +49 9342 800-0
info@ersa.de
www.ersa.com

Kurtz Ersa, Inc.
usa@kurtzersa.com

Kurtz Ersa Mexico
info-kmx@kurtzersa.com

Kurtz Ersa Asia Ltd.
asia@kurtzersa.com

Ersa Shanghai
info-esh@kurtzersa.com

Kurtz Ersa Vietnam
Company Limited
info-kev@kurtzersa.com

Ersa France
info-efr@kurtzersa.com