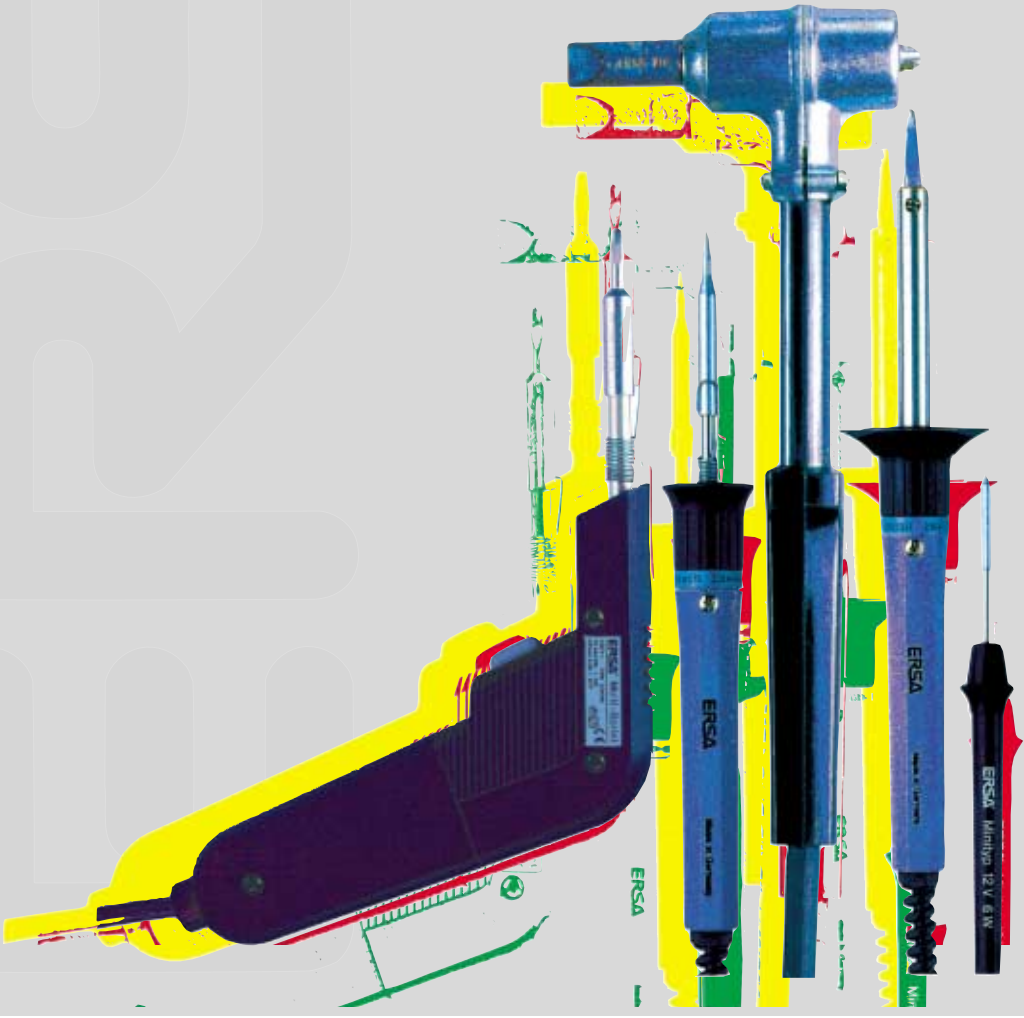
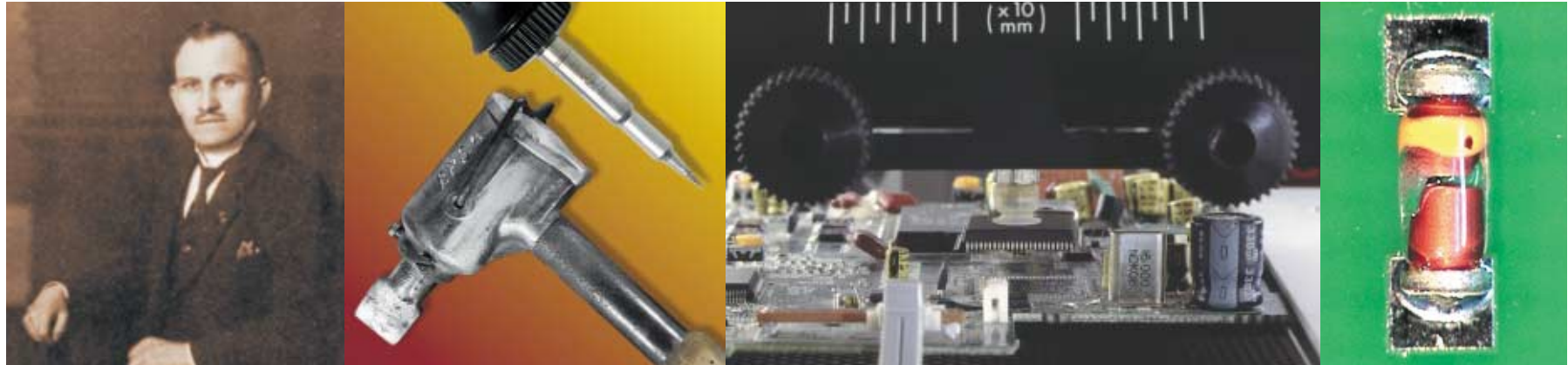


SOLDERING GUIDE



Soldering Technology - a never ending story for more than 5,000 years



Man had scarcely learned how to use metals for his purposes when the desire to join them arose in him. Many of the pieces of jewelry, tools and weapons we know from the Bronze Age were given their utility and beauty by soldering.

Today, it is difficult to say who first discovered how to "glue" metals. One thing is certain, the goldsmiths of ancient Egypt knew how to join gold more than 5,000 years ago. Their colleagues in Troy were also master solderers long before the ancient Teutons could even dream of such handicraft.

Soldering "came of age" when tin was discovered as a soldering metal. After all, that was 4,000 years ago.

From then on, the world's soldering technology was on its way upwards. It first spread around the Mediterranean. The Cretians showed it to the Etruscans, who then taught it to the Romans, Tunesians, Spaniards, followed by many others, including the less developed cultures of the time - the Swiss, Bohemians, Hungarians, Teutons and Scandinavians.

The art of soldering was improved and sophisticated from culture to culture, generation to generation.

Looking back, the most impressive achievements can be attributed to the ancient Romans. They soldered 400 km long water pipes made of lead

with seams which could withstand 18 Atm (!), and conjured up stoves and tubs made of bronze, not to mention the arts of their goldsmiths and armorers.

The last century, in particular, not only witnessed an increased improvement in the craftsman's soldering skill, but also our understanding was refined in respect to the scientific interactions which take place during soldering.

Consequently, soft soldering developed into an independent field of production engineering in the electronics industry. It combines the disciplines of mechanics, chemistry, physics and metallurgy, to an equal extent.

Ernst Sachs, founder of **ERSA** (a name comprised of the beginning letters of his first and last names) contributed to this.

In 1921, 80 years ago, he developed the first electric and mass-produced soldering iron for industry. Driven by a desire to innovate, we have devoted ourselves to the continuous development and perfection of soldering technology.

With the world's largest spectrum of soft soldering products and 80 years of industrial experience, ERSA is synonymous with expertise and quality. Our range of hand soldering tools begins with the smallest, 5-watt needle and covers everything from conventional hand soldering equipment, countless customized solutions for special applications, to the 550-watt workshop soldering iron.

Moreover, ERSA's electronically temperature-controlled soldering stations now represent, in the same way, the standard for the entire industry as the complete line of wave, reflow and selective soldering systems.

ERSA quality products have their home in a myriad of places. From hobby shops for Tiffany soldering, to electric hardware shops, up to toughest OEM factory applications, our product range is designed to meet every soldering need.

This versatile soldering guide should help you find your way into the "world of soldering" - and perhaps we can ignite a "soldering fire" in you, just as it has burned for 80 years in our hearts.



ERSA's state-of-the-art center for soldering technology in Wertheim

Soldering iron heated by fire: Soldering technology around 1536

In the industry, at home, and everywhere - the art of soldering



With ERSAs high quality soldering tools, anyone can practice the art of soldering...

Soft soldering is an indispensable part of modern technology. It is the preferred means of producing reliable electrical connections. Such connections are required in household appliances just as much as they are in computers or space shuttles. In other words, almost nothing works nowadays without soft soldering. Just ask your electrician, TV-serviceman, vehicle mechanic or dentist about soldering. Even the bosses at IBM, Siemens, Rolls Royce or NASA will give you the same answer.

... for Tiffany-soldering



... for hobby-applications



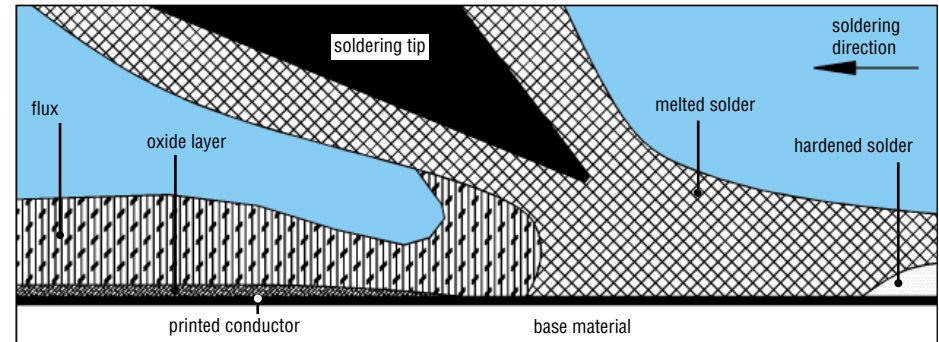
... and service-use

A soldering iron around the house may not put a carpenter out of work, but replaces a good number of other craftsmen dealing with electrical and sanitary installation, radio, TV, lighting and communications

... for industrial use



technology, electronics, etc. In addition, there are a variety of hobby applications in which the use of a soldering iron is by no means subject to limitations, when it comes to imagination and versatility.



Flux reaction during soldering on a printed conductor when a soldering wire with flux core is used

But what exactly is the "art of soldering"?

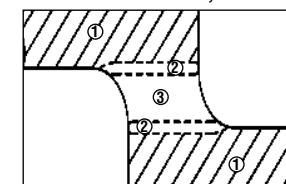
Soldering is when two metallic workpieces are joined with the aid of molten metallic binding material (solder). The trick lies in having the melting point of the solder lower than that of the metal to be joined. If this point is below 450°C, the process is termed soft soldering. If it is above the value, it is hard soldering. Opposed to this, when welding, the metals to be joined are brought to their own melting point by heating and the material is then "fused". In soft soldering, the joints between the metals to be joined are filled with an alloy made of lead and tin. It is important that this alloy does not simply stick to the surface of the foreign metal after cooling, instead it must unite with the metal. For this purpose, a small quantity of the foreign metal must be

dissolved and unite with the alloy, i. e. form mixed crystals in the so called "intermetallic zone". Tin is responsible for this, whereas lead is charged with making the solder easy to melt and ensures the mechanical stability of the joint. A solder joint consists of five zones:

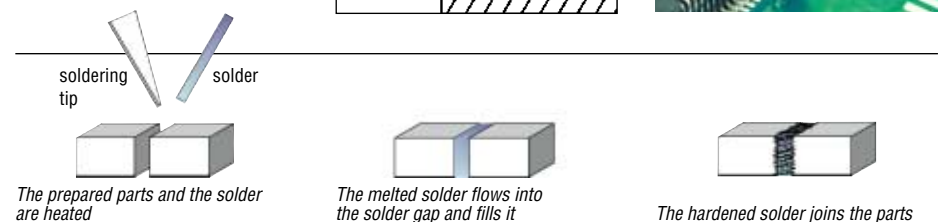
- ① Basic material
- ② Zone of mixed crystals
- ③ Hardened solder
- ④ Zone of mixed crystals
- ⑤ Basic material

For maximum tensile strength, which is synonymous to best solder joint quality, it is important that the intermetallic zone is neither too small nor too thick. The ideal parameters are 0.5 μ intermetallic produced at 220°C to 280°C, within about two seconds. With a higher rate of intermetallic material, the solder joint becomes brittle and porous, with less than 0.5 μ we have no tensile strength and therefore a bad or "cold" solder joint.

Cross section of a solder joint

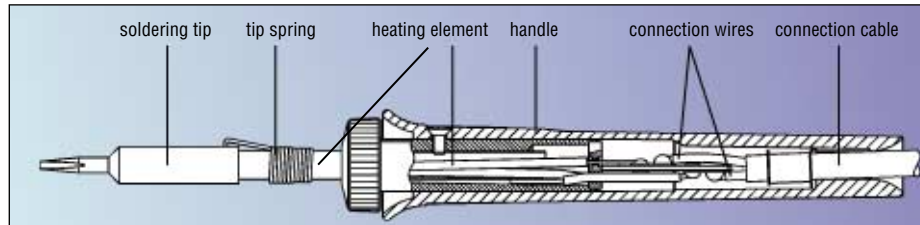


ERSA SolderWell Technology



What do you need for soldering?

1. The soldering iron for heat



Heat is required in order to melt the solder. It's the job of the soldering iron to provide this heat. Temperatures of 200-450°C are needed, depending on the solder joint and the

solder used. The usual temperature in the electronics field lies between 250°C and 350°C. In order to have the proper temperature for every soldering application, the

thermal rating of the soldering iron is important. You must choose one which lies within the desired temperature range or choose an adjustable soldering iron or soldering station.

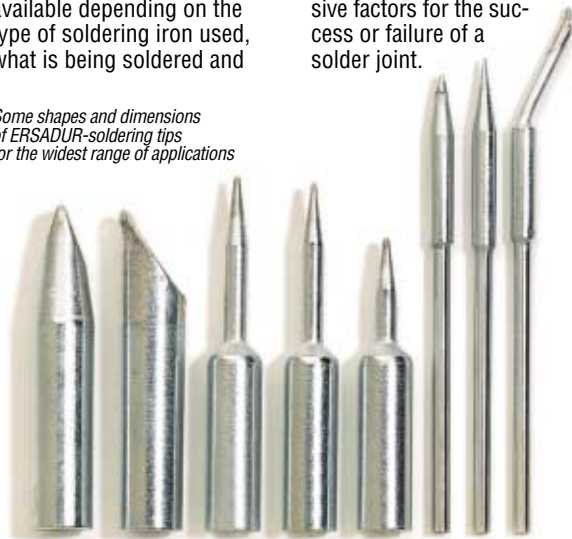
2. The soldering tip for transferring heat from the heating element to the joint

The soldering tip is the actual "heart" of the soldering iron. It is responsible for the transfer of heat from the heating element through the solder to the soldering joint. Different soldering tips are available depending on the type of soldering iron used, what is being soldered and

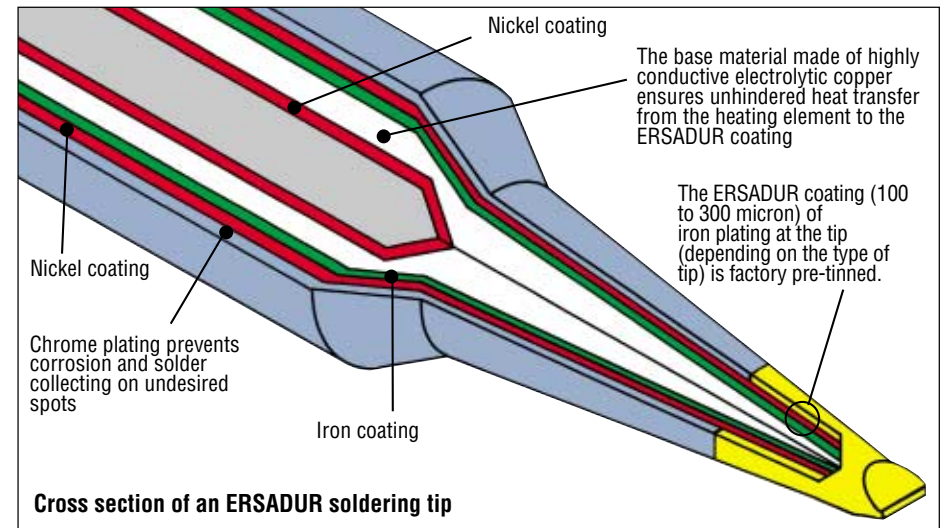
how often soldering occurs. The most important groups are nickel-plated copper soldering tips, non-scaling (coated) soldering tips and ERSADUR-soldering tips. Its composition and quality are the decisive factors for the success or failure of a solder joint.

The technical requirements are proper shape, perfect heat conduction, flawless composition and reliable durability and must also feature precise sensitivity. For this reason, one cannot be demanding enough when selecting a soldering tip.

Some shapes and dimensions of ERSADUR-soldering tips for the widest range of applications



Internally heated silver soldering tip



Cross section of an ERSADUR soldering tip

How to take soldering quality to the top - ERSADUR soldering tips

Traditional soldering tips are made of copper, which conducts heat well and is inexpensive, but not without disadvantages. The tip oxidizes heavily when heated and copper particles are set free into the solder until it has been "corroded" entirely. Lots of care is required to keep the tip functional.

and premature wear thanks to perfect heat transfer.

ERSADUR stands up to the various demands found in soft soldering technology with a comprehensive range of soldering tips.

This range extends from soldering shaft diameters of 0.2 mm (for microelectronics) to 17 mm.

ERSADUR-soldering tips, on the other hand, have been designed for continuous operation and high quality. The special process to achieve this was developed by ERSA and is protected by a patent.

ERSADUR soldering tips are galvanically plated with an iron coating which is then shielded against oxidation and corrosion by a layer of chrome. The heating element of the soldering iron is protected against overheating

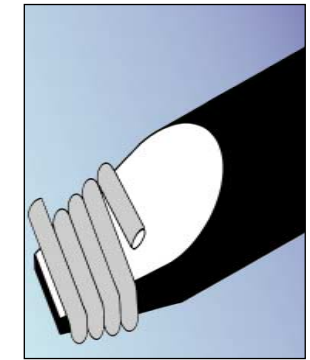
To do this, wrap flux core solder around the soldering tip and heat the iron. In addition to this, the hot tip should be cleaned regularly with a moist sponge.

Spare sponges are available in specialized trade.

ERSADUR soldering tip care Provided that the ERSADUR soldering tips are properly cared for, tip life can be extended. The following steps should be taken:

ERSADUR tips should always be coated with solder. Without this coat, they become passive and will no longer accept solder. In this case, the tip can be reactivated with flux and solder.

Pre-tinning of a soldering tip



Further materials needed for soldering

3. Solder for the connection

Alloy	Flux type	Melting point/zone	Application
1. L-Sn 60 Pb	1.1.2 (F-SW 26)	183°C - 190°C	1.-3. for general soldering work in electro-technology and electronics
2. L-Sn 60 Pb 38 Cu 2	1.1.2 (F-SW 26)	183°C - 190°C	1.+3. particularly suitable for ERSADUR-soldering tips
3. L-Sn 63 Pb 37	1.1.3 (F-SW 32)	183°C eutectical	4. especially for SMD-technology
4. L-Sn 62 Pb 36 Ag 2	1.1.3 (F-SW 32)	179°C eutectical	low flux content for low-residue soldering

ERSA soft solders for the widest range of applications

Metallic bonding agents, usually in the form of a wire or bar, are available in different alloys and compositions.

The composition of the alloy determines the melting temperature and the physical properties of the joint.

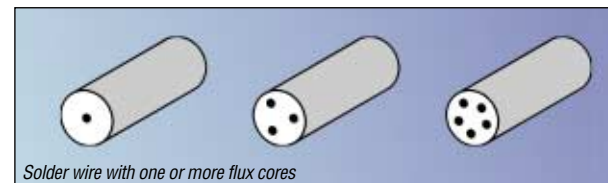
Soft solders usually consist of a mixture of tin (Sn) and lead (Pb). Possible additives are antimony, copper, silver, zinc and cadmium.

The most commonly used solders in the electronic industry are the alloys L-Sn 63 Pb and L-Sn 60 Pb.

4. Flux for improved contact

Flux is used to attain the best possible contact between the solder and metal. It ensures metallicly clean surfaces on the parts to be soldered, eliminates oxides and impurities which can hinder soldering and prevents the formation of new oxides when soldering. There are different types of flux: acid

flux (for plumbing work) and acid-free products (for electrical and electronics work). Flux cored solder (soldering wire) with one or more flux cores is the primary type of solder used in electrical engineering. Bar solder is used mainly for plumbing, as well as in radiator and body work.



ERSA®
FOR HEALTH AND ENVIRONMENT

And of course a safe environment

Safety first, especially while soldering. The VDE and GS signs ensure the electrical safety of soldering tools. The use of the VDE sign obligates the manufacturer to monitor production in accordance with test guidelines and to conduct tests which conform to the regulations determined by the VDE testing institute.



ERSA CLEAN AIR solder fume extraction systems ensure fresh air at the workbench

5. A safe and healthy working environment

Consider this while soldering:

- The breathing zone is close to the soldering activity and solder is held in the hand. This presents the risk of contaminating the air, or hands and objects which are touched.
- Flux vapours can damage your health and must be kept away from the breathing zone.
- One should never eat, drink or smoke in rooms where soldering is performed. Traces of lead which remain on the hands can enter the human body through food or cigarette smoke.
- Hands should be washed thoroughly after soldering.
- Soldering refuse is hazardous waste and should not be deposited in normal household garbage.

Note: Good soldering is based upon the proper soldering iron, a clean soldering joint, a perfect soldering tip, the correct flux and solder, as well as the proper soldering time.

Attention: Never do this while soldering!



Highest quality - through best preparations and ideal parameters



Preparation

The most important prerequisite for the success of a good soldering joint is absolute cleanliness. The conductors and components must be free of dirt, oil and oxidation. These can be removed with solvents or flux.

ERSADUR soldering tips should be cleaned with a damp sponge when hot, prior to soldering. Please do not file them as you would copper tips. This would damage the protective coating and render the tips unusable.

Soldering process

The soldering process has three phases: wetting, flowing, bonding. Here, the working temperature is the most important criteria. The best temperature is the lowest at which the three phases can be performed without difficulty. This requires some

right!



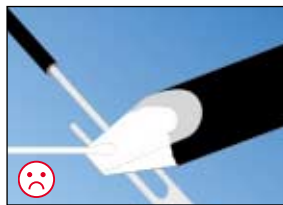
wrong!



right!



wrong!



experience. A temperature controlled soldering system facilitates work significantly.

After cleaning, place the soldering iron on the soldering joint. Then place the solder wire (with flux core) between the

tip and the soldering joint and melt it. Continue to add solder wire until the entire joint has been covered. Then immediately remove the soldering tip in order to avoid overheating of the molten solder. Allow the solder to harden, avoiding vibrations.

Soldering time

The soldering operation should be completed within approx. 2 to max. 5 seconds. When soldering electronic parts you will, with a bit of experience, only need a second

- the famous solder second. A soldering time of more than 5 seconds is inadmissible and indicates that the soldering iron is too cold or not powerful enough.



Soldering quality

A good solder joint can be recognized with bent connection wires on the PCB where the contours of the soldered conductor are still visible. This is assuming that not too much solder is applied.

Another indication is the melting angle. Based on the fact that excellent melting of the solder pads occurs, intermetallic zones (mixed crystals) are created and can be recognized by the small melting angle.

A melting angle of up to 25° indicates good solder quality, angles of up to 50° are acceptable in the field of hand soldering.

Another quality indicator is what the solder surface actually looks like. It should be even, non-porous and shiny.

Brittle surfaces indicate too high soldering temperatures or too long soldering times.

The only absolute quality indicator for an ideal solder joint is production of intermetallic material.

In this diffusion zone, intermetallic compounds of copper and tin are produced (mixed crystals, see page 5). They can only be seen by destroying the joint and making a cross section.

If the diffusion zone is too thick, the soldered joints have

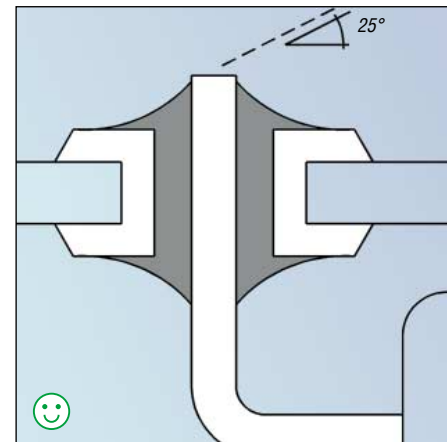
no tensile strength and become brittle. At higher soldering temperatures, the chemical reaction rate is higher, which produces more intermetallic material.

As a result, perfect solder joints have to be made at low working temperatures within short soldering times.

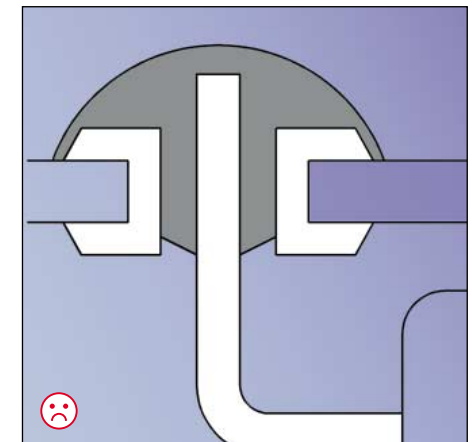
As soon as the last solder joint is produced, the iron should be put back into the holder.

But don't clean the tip before putting it away, because remaining solder on the tip prevents oxidation.

right!



wrong!



Tiffany work - or plumbing solder work

Tiffany work (Soldering glass)

Soldering glass objects generally involves three stages of work:

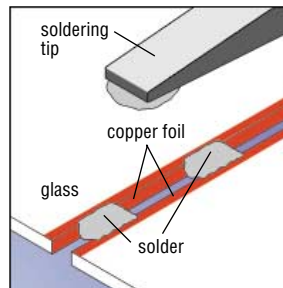
- spot soldering
- rough soldering
- fine soldering.

Before the actual soldering copper foil is glued on the glass edges. Then the spot soldering is carried out. To spot solder, the process by which the glass parts are fastened or connected, take a drop of solder with the tip of the soldering iron and carefully apply to the solder joint. Each spot soldering operation should only take about a second. During rough soldering, the gap between the glass is filled with solder, after flux has been applied.

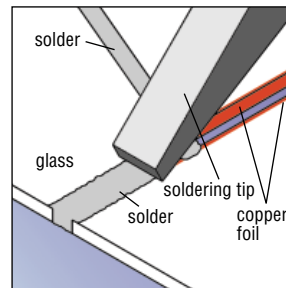
To achieve this, the soldering tip and the solder are allowed to contact above the joint. The speed of the soldering movement and the application of solder to the soldering tip must be coordinated precisely. Always drag the soldering



Tiffany soldering with the ERSA ANALOG 80 T Tiffany station



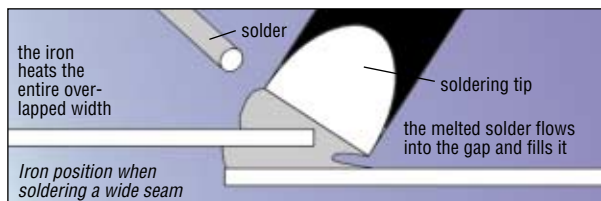
1st step: spot soldering



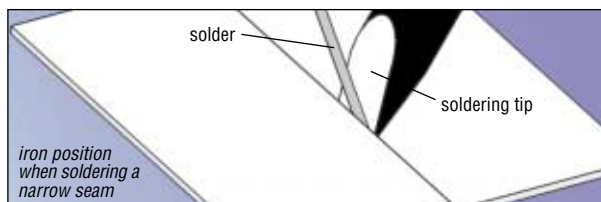
2nd step: rough soldering

iron, never push it. Only in this way a semicircular seam is obtained with an adequate amount of solder. The visual quality of the joint is improved by fine soldering. The

seam to be soldered should always lie horizontally. The soldering tip is pulled slowly and evenly without interruption along the seam from the beginning to the end.



Iron position when soldering a wide seam



iron position when soldering a narrow seam

Plumbing soldering work

If metal sheets or pipes have to be joined, the metal at the soldering joint must be bare. For this reason, it must be cleaned thoroughly. Afterwards flux, soldering paste or liquid flux is applied and the soldering joint is heated with the tip of the soldering iron. Then add the solder to fill the soldering seam. Once the solder has hardened, remove the aggressive flux residue, which causes corrosion.

Correct desoldering is not difficult

Desoldering: the perfect tool for all applications

The most important thing for successful desoldering is the correct tool. You can choose between desoldering wicks (via capillary action), mechanical desoldering pumps or electronic temperature regulated desoldering systems. These are divided in desoldering systems with conductive heat and those with hot air.



Temperature controlled desoldering iron



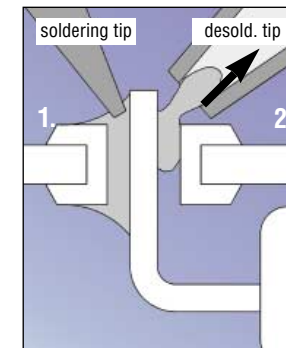
Removing heated and melted solder by means of a mechanical desoldering pump

Desoldering

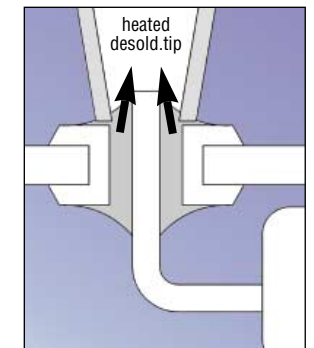
Reheating is not recommended for repairing a faulty solder joint. It is better to remove the solder by means of a desoldering tool or with a desoldering wick and to resolder the joint.

When using a desoldering pump the solder joint has to be heated with the soldering iron until the solder has melted. Then remove the soldering iron and place the desoldering pump on the joint and extract the solder.

In the case of heated desoldering irons, the hollow desoldering tip should be placed on the solder joint ensuring a sound thermal contact. Once the solder has melted, it is extracted. Desoldering is also



Desoldering with desoldering pump

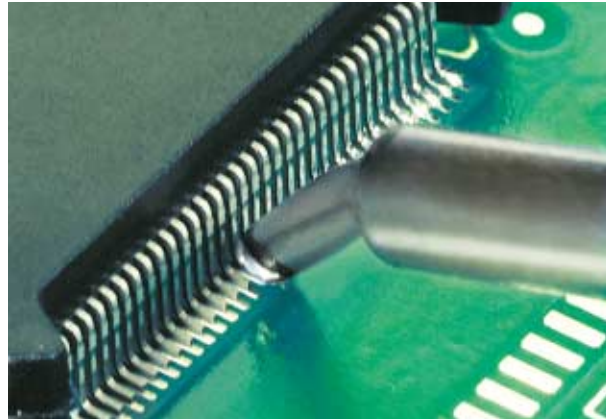


Desoldering with temperature-controlled desoldering iron

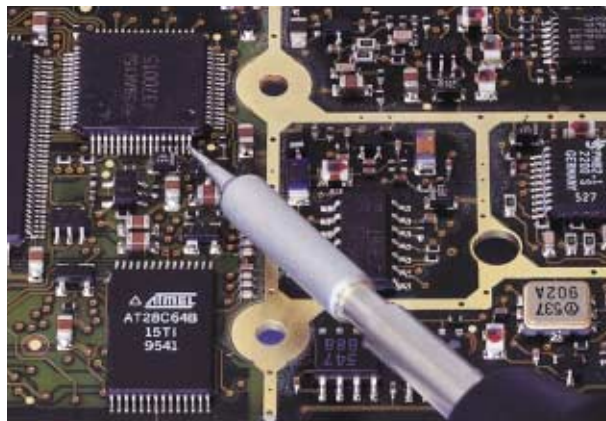
dependent upon proper tip selection. The inner diameter of the desoldering tip should be roughly the same size as the hole in the circuit board or slightly larger. The best desoldering results, with least damage to the

circuit board or components, can be achieved with temperature controlled desoldering irons (see p.24/25). Basically, you have to distinguish between desoldering thru-hole components and SMD components .

SMD-Technology - great tools for small components



ERSA SolderWell Technology for Fine-Pitch installation within seconds



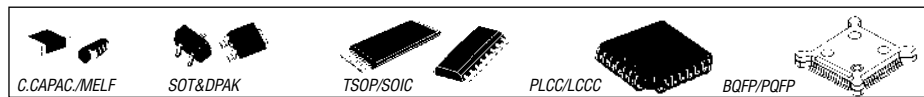
SMD-soldering with the ERSA Micro tool and an ultra-fine pencil-point soldering tip



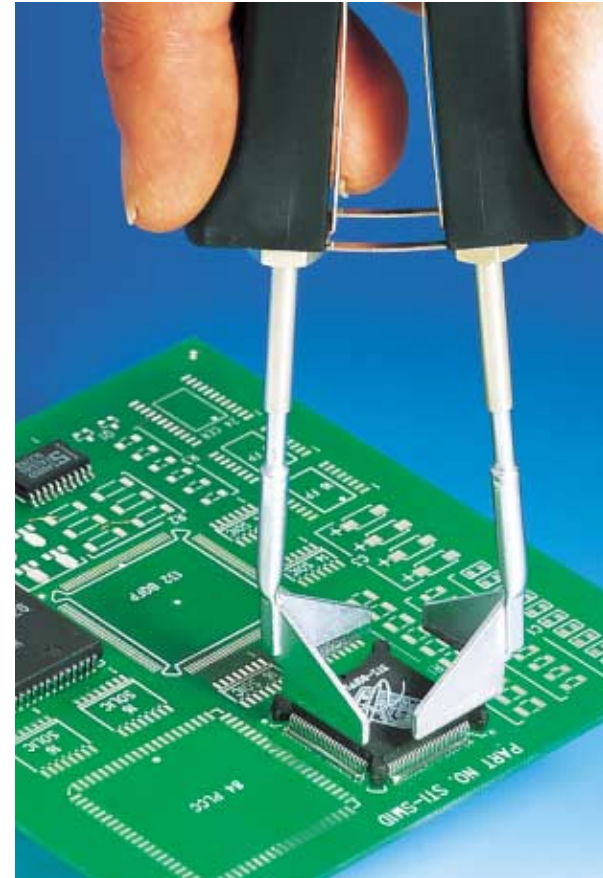
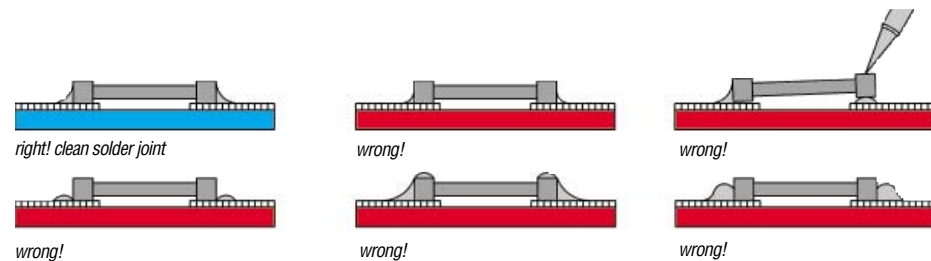
Hot air soldering and desold. of SMDs

SMD-soldering

The constantly growing importance of this technology, combined with its highly-integrated micro-sized components, places great demands on SMD soldering equipment. The tools required include at least one set of fine pointed tweezers for positioning, an ultra-fine soldering iron with ERSADUR soldering tip (beginning with 0.2 mm) and thin SMD-solder wire (Sn62Pb36Ag2, 0.5 mm) with an acid-free flux core. With the revolutionary ERSA SolderWell technology, common solder wire and the right ERSA SolderWell tip are all you need. For detailed information please refer to our process descriptions (see page 35).



Some examples of SMD-components



SMD-desoldering within 3 seconds - thanks to the ERSA desoldering tweezers



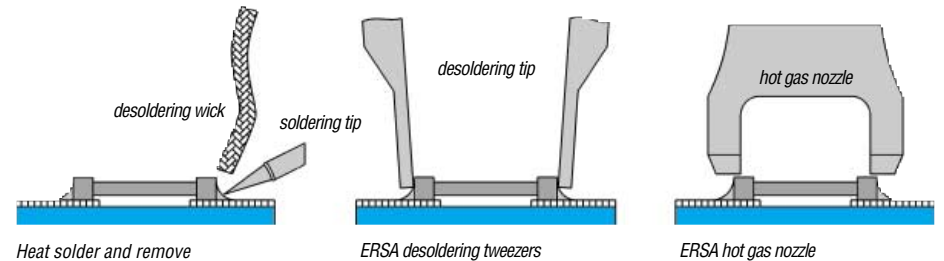
SMD-desoldering with tweezers

SMD desoldering

To desolder and repair a damaged SMD component, the suitable tool is needed to remove the component from the PCB. Desoldering tweezers or a hot air iron can be used. If conductive tweezers are used, it is most essential to choose the correct desoldering inserts. After having desoldered the component, the PCB has to be cleaned (e.g. with a No-Clean desoldering wick). Afterwards, the new component can be positioned and soldered. For further details, please refer to our process description "SMD-Removal" on page 35). For the soldering and desoldering of BGA components please refer to our semi-automatic IR 500 A Rework Center on page 28.



Some examples of different desoldering tip shapes



Soldering irons from 5 to 550 watts - meeting demands for various applications

ERSA MINOR: an ultra-fine soldering iron weighing incredible 6 g



Minor, 5 W



Fine soldering iron ERSA MINOR

Miniature soldering iron with a rating of 5 watts and a tip temperature of 440°C.

The ideal tool for ultra-fine soldering of microcircuits and microscope soldering. 6 V transformer-operated (e.g. ERSA SNT 30/6) or 6 V battery-operated.

The reduced distance between handle and curved soldering tip takes particular account of ergonomic requirements.

ERSA Minor, in addition to the electronics industry applications, is used for clock production or repair, for photographic industry and dental engineering applications.

ERSA 30 S universal soldering iron - one for all!



ERSA 30 S, 30/40 W



Universal soldering iron ERSA 30 S / ERSA 50 - 150

The best-selling and most tried and tested ERSA soldering iron with 30 and 40 watt ratings. The practical stick-on support disk ensures a maximum of ergonomics.

This universal soldering iron is designed for multi-purpose use in the crafts, service and hobby sector. A practical soldering set with desoldering pump and additional soldering tip is also available for this versatile soldering iron to handle numerous soldering and desoldering challenges on the go. The 50, 80 and 150 watt versions, supplied with a bent soldering tip, are ideal to solder copper conductors from 2.5 up to 6 mm² cross sections (no figure).

ERSA Multitip - internally heated fine soldering iron for small joints



Multitip line, 8/15/25 W



Fine soldering iron ERSA Multitip-series

A particularly short, light and easy-to-handle soldering iron with a minimum distance between the soldering tip and the front of the handle. Internally heated soldering tips ensure ultimate performance. With their rating of 8, 15, and 25 watts, the Multitip line is designed to solder small and medium-sized joints such as distribution strips and hobby applications. The industrially proven PTC heating elements in the 15 and 25 watt irons ensure high-speed series soldering due to the short heating times. The handy soldering and desoldering sets executed in 15 and 25 watts, with integrated desoldering pump, solder wire, and additional tip are ideal for multi-purpose tasks.



ERSA 250/350, 250/350 W



ERSA 200/300, 200/300 W



ERSA 550, 550 W

Workshop and hammer soldering irons ERSA 200 to 550

Thanks to their stretched form, these powerful workshop soldering irons with 250 and 350 watt ratings are ideal for internal soldering work in containers, car body construction and for radiator repair. They easily fit in any clamping device and can be used to heat branding irons for wood or plastic branding purposes.

The hammer-shaped soldering iron series with 200, 300 and 550 watt ratings, is particularly suitable for sheet tinning and installation work, as well as collector and copper rail soldering.

Always a quick trigger: Special soldering irons and off the line soldering



internally heated soldering tip ensures high performance. The Multi-Sprint is ideal for assemblies and repairs requiring a rating from 15 - 100 W.

ERSA high-speed soldering: press the button and go

An unusually light and transformer-independent solder gun with PTC heating element providing high heat-up rating. The ERSADUR long-life soldering tip is only heated as long as the button is pressed. Thanks to the

very short heating times it is ideal for high-speed series soldering. The heat supply can be adapted to the soldering requirements by periodically pressing the button. The



ERSA Multi-Sprint, 75 W



ERSA Independent 75, 15-75 W



ERSA Independent 75

Since this soldering iron does not depend on a cable, anything can be soldered in any way, anywhere, at any time. In comparison to electric soldering irons, the rating can be adjusted steplessly from 15 to 75 W. The large selection of soldering tips opens up many applications apart from conventional soldering such as SMD soldering, micro welding, shaping and cutting of plastics and processing of heat-shrinkable sleeves.



ERSA Independent 130, 25-130 W



ERSA Independent 130

The "larger edition" of the ERSA Independent 75, with its rating of 25-130 W, is most suitable in situations where sophisticated soldering solutions are required off the line, as for example servicing, installation, repair and maintenance. The integrated piezzo ignition together with the fact that the iron operates on commercial butane gas ensures easy handling and high reliability.



ERSA Multi-Pro, 25 W

ERSA Multi-Pro - internally heated fine soldering iron



Internally heated fine soldering iron ERSA Multi-Pro

The ERSA Multi-Pro is an internally heated fine soldering iron with extremely heat resistant cable. It can be operated with the entire 832 and 842 ERSADUR soldering tip line with tip turn protection. Tip shapes range from 0.4 mm diameter pencil point and all chisel shapes to 9.8 mm angled face types. Furthermore IC and SMD desoldering tips are available. Due to this wide range of soldering tips, the Multi-Pro can be used for many different applications, for both conventional soldering and SMD soldering and desoldering.



ERSA Mobil tool, 6 W



ERSA Mobil tool

The ERSA Mobil tool is an extremely light, compact and extremely flexible and efficient battery-powered soldering iron which is perfectly suited for hardly accessible fine soldering joints. It is operated with commercial 1.5 V round cells. Due to the patented heating system, extremely short heat up times are provided. The Mobil tool can be obtained as a set consisting of 2 soldering tips, one tip exchanger and 3 batteries.

ERSA soldering stations: temperature control for beginners and high-tech industry



ERSA MS 250 S - one station, two irons, millions of applications

The ERSA MS 250 S provides the demanding hobby electrician with temperature control and alternative connection facilities for two different soldering irons. The 25 watt Multitip soldering iron is ideal for standard soldering tasks.

Fine joints, as on SMDs, are best done with the 6 watt Minitype iron. The internally heated ERSADUR-soldering tips combine high performance with a long service life. The soldering tip is supplied



ERSA Minityp for fine solder joints



ERSA Multitip for high heat applications

with a high-resistance connection, which is installed to the front potential equalization socket. The funnel-shaped tool holder is attachable both to the left or the right side of the station.



ERSA MICRO-CON 60 iA - the intelligent champion

Multifunctionality and intelligence are two of many highlights of our top-of-the-line soldering station. This micro-processor-controlled and fully antistatic soldering station combines top notch technology and yet has minimal space requirements.

The ERSA SENSOTRONIC microprocessor control with Fuzzy-logic "intelligence" provides amazing heat-up times and repeatable solder joint quality.

The ERSA MICRO-CON 60 iA has automatic identification of

four connectable soldering and desoldering tools: the included soldering iron **ERSA Tech tool**, two other soldering iron alternatives, and desoldering tweezers.

The **ERSA Tech tool** ensures reproducible solder joint quality at lowest production temperatures. The **ERSA Power tool** soldering iron with its heat-up rating of 290 watts is ideal for extreme high-mass and multi-layer applications. The SMD-soldering iron **ERSA Micro tool** meets miniature and Fine-Pitch soldering application demands and the desoldering



tweezers **ERSA Pincette 40** provides rapid and safe removal of all SMDs.

The extensive soldering iron tip range includes, among others, the super fine 0.2 mm pencil tip,



the 17 mm thermal power tip, and the ERSA MicroWell, ERSA TechWell and ERSA PowerWell tips for **rapid installations of ultra Fine-pitch (TAB) components at production temperatures.**

Several user-friendly menu levels, 8 presettable temperatures, 4-digit password lockout or stand-by function are some more exemplary features of this extraordinary soldering station.



ERSA ANALOG 60 - the industrially-proven soldering station

The electronically temperature-controlled ERSA ANALOG 60 soldering station is the standard model in ERSA's new series of soldering stations.

The ceramic PTC heating element functions simulta-

neously as a temperature probe (RESISTRONIC-temperature control system).

The high heat up rating of 190 watts guarantees the immediate supply of heat and a heat up time of 60

seconds from room temperature to 280°C.

The large selection of long-life internally heated ERSADUR-soldering tips make this versatile soldering station suitable for most soldering applications.

The model ERSA ANALOG 60 A is completely antistatic according to MIL-SPEC/ESA-standards.

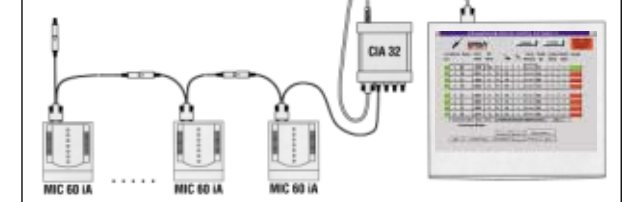
ERSA ANALOG 60 Profi-Set in a case



ERSA CIA 32 interface adapter



PC networking model with ERSA CIA 32



ERSA MICRO-CON Process Control Software (option)

Software monitors and documents real-time temperature profiles of up to 32 stations.

Supervisor can set, display and change working temperature from a remote PC.

ERSA DIGITAL 2000 A: intelligent and multifunctional

Control unit of the DIG 2000 A with five different soldering and desoldering tools



ERSA DIGITAL 2000 A - User-friendly and multi-functional 80 W soldering station

The ERSA DIGITAL 2000 A is an intelligent, microprocessor-controlled soldering station. Outstanding flexibility and multi-functionality sets this system apart from others. The ERSA DIGITAL 2000 A is fully antistatic according to MIL-SPEC/ESA standards and has a potential equalization jack with a high-resistance connection to the soldering or desoldering tip.

The following tools can be operated with this station:

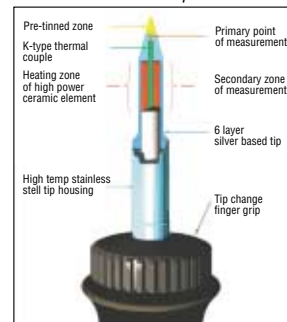
- Tech tool
- Micro tool
- Power tool
- Pincette 40
- X-Tool

The soldering station automatically identifies the tools

when they are connected and adjusts automatically according to the tool's requirements.

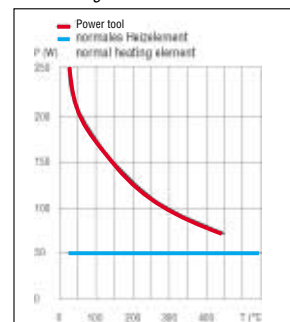
Apart from multi-functionality, simple and comfortable operation is another highlight of the station.

Structure of the Tech tool with ERSADUR-silver based tip



Further features are: set value adjustment, the possibility to select °C or °F on the temperature unit, selection of a stand-by period between 0 to 60 minutes, offset and calibrating function, as well as the possibility to block any

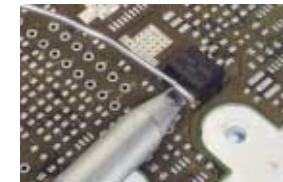
Performance curve with the PTC heating element



SMD-soldering with the Micro tool

adjustments by a 3-digit pass word. The station's heating system can be adjusted to the corresponding application with the help of the integrated "Energy Function".

To increase user-friendliness, the soldering station also includes 4 programs. Each program can be configured independently and differently



Power tool soldering iron for increased heat supply

with the above mentioned iron has its own program, and when the tools are changed, the soldering station automatically switches to the corresponding program.

Consequently, the DIGITAL 2000 A is perfectly suited for operation with the Tool Selector. If only one soldering



Conventional desoldering with the ERSA X-Tool

iron is required, all programs are available for this iron.

The temperature is controlled by a digital PID algorithm, optimized for precise and quick temperature control.

Application



ERSA Tool Selector - one tool for many stations

The Tool Selector is connected to the MICRO CON 60 iA or DIGITAL 2000 A instead of the soldering or desoldering iron.

It is possible to alternately select from the four connected tools without having to pull plugs. As soon as a new tool is selected, the program (parameter set) changes automatically.

The following soldering tools can be connected:



- ERSA Tech tool soldering iron for maximum precision
- Power soldering iron ERSA Power tool
- SMD soldering iron ERSA Micro tool
- SMD-desoldering tweezers ERSA Pincette 40
- Desoldering iron ERSA X-Tool

Temperature controlled or mechanical desoldering solutions



ERSA X-tool - electronic temperature controlled desoldering station

The new ERSA X-Tool is a high-tech tool to desolder wired components from one-sided, two-sided or multilayer circuit boards.

In order to prevent any damage to the circuit boards or components, the high performance of the X-Tool 120 W (preheating power 260 W) guarantees efficient desoldering with an ideal dwell time



even under maximum load lasting over an extended period. The heat energy stored in the solder tip; the powerful heating elements in conjunction with an extraordinarily proficient heat transfer owing to outstanding structural qualities of the removable desoldering tip; and the presence of a temperature sensor very close to the desoldering tip - all these combine to ensure peak performance at all times.

In addition to this is the instant availability of the vacuum immediately after pressing the button; the ergonomic form and user-friendliness of the tool, easy exchange of the inserted desoldering tip, and the easy removal of the residual solder with the aid of a

built-in solder collector - all these outstanding features make for an unrivaled high-tech tool.



ERSA ELS 8000 - Electronic temperature-controlled modular soldering and desoldering station

The electronically temperature-controlled ERSA ELS 8000 soldering and desoldering station is suitable for a wide range of applications for industrial, laboratory and repair work. The supply unit incorporates a high-power vacuum/compressor unit to make the station independent from a compressed air supply. The temperature of the soldering tip can be adjusted steplessly between 150 and 400°C.

The soldering iron is extremely powerful, thanks to its ceramic heating element featuring a high PTC (Positive Temperature Coefficient) 290 W heat up rating and a rating of 80 W at 350°C. Outstanding features of the internally heated ERSADUR-long-life soldering tips are the remarkable thermal conduction and long service life. The desoldering iron is fitted with a PTC ceramic heating element with

integrated temperature probe. The desoldering iron consists of a desoldering head attached to the soldering iron with a special screw fitting. The solder compartment incorporates a heat-resistant glass tube and holder. A knurled screw provides easy and quick removal of solder gathered in the solder compartment. The device is galvanically isolated from the mains supply by means of a safety transformer and operates at a low voltage of 24 V. The electronics control offers a zero crossing energy supply. A potential equalization socket ensures easy integration of the desoldering iron (or soldering iron) into the potential equalization of the workplace.

Special desoldering head for "hot tasks"



Desoldering pumps ERSA VAC and Soldapullt

Outstanding features of the industrially proven desoldering pumps from ERSA are the high pumping performance and low backlash desoldering properties. The antistatic models allow carefree desoldering of electrostatically irritable assemblies. After melting the solder with a soldering iron, it is quickly and completely sucked off. The long, slim desoldering tips also make work on closely assembled boards possible.



ERSA SMD-Rework solutions - as easy as 1-2-3



ERSA SMT UNIT 60 A - soldering and desoldering station for SMT Fine-Pitch removal and installation within seconds

The SMT UNIT 60 A from ERSA will handle virtually any soldering job - whether it is SMD soldering, desoldering or repair

work. The electronically temperature-controlled antistatic station has two separately controlled tools: the ultra-light

ERSA Micro tool SMD soldering iron and the versatile ERSA Pincette 40 desoldering tweezers. An extensive range of ever growing soldering and desoldering tips for SMD complements these tools. The ERSA Micro tool has a range of long-lasting ERSADUR-soldering tips beginning at 0.2 mm making it ideal for very fine and compact soldering work. In addition, the revolutionary ERSA MicroWell tip enables the installation of Fine-Pitch SMD's within seconds. The desoldering tip range of the ERSA Pincette 40 desoldering tool covers everything from MELFs and MINIMELFs to SOIC packages, QFPs and PLCC 84.

Installation of Fine-Pitch components

Upon the first sight the soldering of Fine-Pitch components by hand seems to be a tough job, but with the right equipment it is really easy: Insert ERSA MicroWell soldering tip (1) into the ERSA Micro tool soldering iron (2) and set a tip temperature of 285-295 °C.

Apply flux (see page 30) to the pins on all sides of the component. Clean the front and concave of the MicroWell tip with a damp sponge.

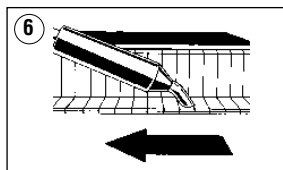
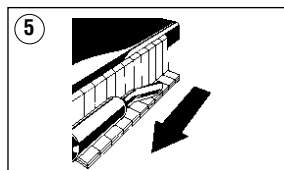
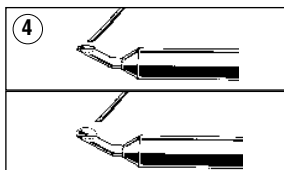
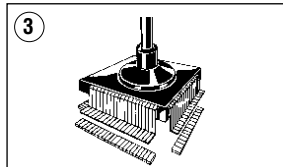
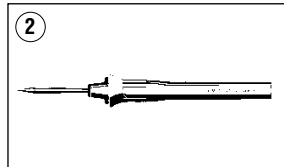
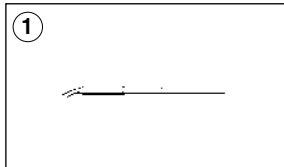
Fill the concave with solder wire to slightly above the rim (4). Do not overfill the tip.

Then position the component (3) and fix two corner pins.

Holding the Micro tool very lightly in your hand set the

filled tip with the ERSA MicroWell side parallel to the PCB down onto the flat exterior portion of the pins (5) and slowly pull the tip across the pins towards you (6). In this way the single soldering joints form optimally and evenly.

Repeat steps (5) and (6) to solder the remaining sides.



ERSA modular system with optional kit for thru-hole soldering and desoldering

ERSA Rework 80 - the complete SMD/rework solution

The multifunctional, electronically temperature-controlled ERSA Rework 80 soldering and desoldering station is the all-round station for repair work on SMD and mixed technology assemblies.

The supply unit provides a constant high output of power and has an integrated vacuum pump and SMD-placer.

The hot air control unit precisely meters the hot-air stream of the hot air iron and also controls the temperature. The electronic control unit with digital display monitors the temperature of the SMD-soldering iron and desoldering tweezers. **All 4 tools can be used at the same time and controlled separately.**

The highly accurate hot-air stream of the hot-air iron allows for work on either single or multi-lead components. The revolutionary ERSA **Micro**



SMD desoldering



SMD positioning



SMD soldering



Hot air SMD soldering and desoldering

tool and the ERSA MicroWell tip let Fine-Pitch components be installed in a matter of seconds.

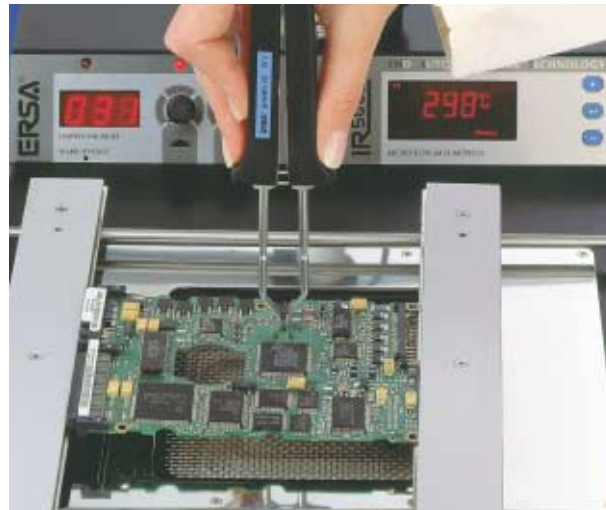
The SMD-desoldering tweezers give the capability to desolder everything from MELFs and MINIMELFs to SOIC packages and PLCC's. The **VAC-Pen** vacuum placer enables precise handling of SMT components.

ERSA SMD 8012 tip holder
Completely equipped tip holder for SMD-soldering and desoldering tips. Organizes the workbench and saves space.



ERSA SMD 8013

SMD solutions from the expert for the experts



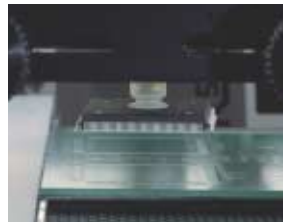
ERSA SMD soldering equipment grants every wish

The enormous influence of Surface Mounted Technology (SMT) on industrial PCB production challenges both users and manufacturers of SMD equipment.

The new line of ERSA SMD hand soldering equipment

was developed in order to enable reproducible quality at the workbench due to process control.

We know the production parameters and realize them via **on-line process control**. Our wide product range in-



Fine-Pitch soldering and desoldering



ERSA SolderWell technology

cludes a large selection of soldering and desoldering tools, soldering/desoldering tips and modular systems. Starting from Fine-Pitch to ceramic hybrids to MINIMELFs on multi-layer boards, ERSA SMT equipment meets all your requirements.

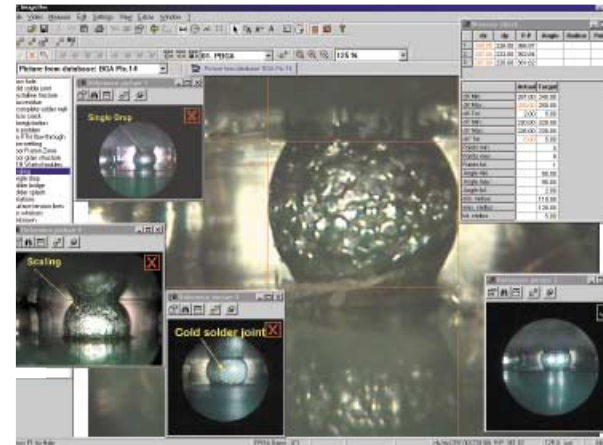
PL 500 A / IR 500 A and monitor



ERSA IR 500 A

The ERSA IR 500 A is a complete stand-alone system designed for every rework application. The user-friendly operating instructions will assist and ensure that all operators conduct process controlled rework in minutes. The integration of the revolutionary ERSA MICRO-CON 60 iA offers the expansion of the unit to include a total of up to 5 various tools to handle every rework, repair and soldering application. An extremely precise X/Y/Z-placer (PL500A) is optionally available.

Visual inspection systems made by ERSA



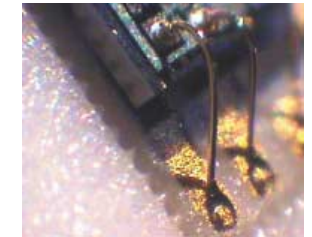
To see is to survive

The miniaturization trend and growing competitive pressure increasingly challenge the electronics industry. Inspection of solder joints and PCBs has become an essential part in Total-Quality-Management. So far, it was only possible to examine solder joints superficially or the entire PCB was



destroyed. ERSA recognized this need and, with the **ERSASCOPE Inspection System**, engineered the first optical system to visually inspect hidden solder joints under the component without destroying it. The optical unit offers a cross-sectional visual image of BGAs, Micro-BGAs and Flip Chips by looking under

The operator dependent decision making process which was subjective, based on the knowledge of the individual now becomes objective through the various "expert databases". The ImageDoc Software allows for inspection and



measurement, classification, analyses, action and documentation. With features such as the integrated problem/solution database, automatic measurement, reference pictures etc. the system becomes an invaluable process control tool.

the component. Furthermore visual images of interior fillets of, e. g. PQFP and PLCC components can be obtained quickly and easily. With images from particularly every angle and an enormous magnification range this flexible solution for the workbench offers a multitude of applications such as the inspection of solder paste deposition, stencil thickness, via-hole diameters, adhesive dots or component coplanarity before soldering. The MAGNISCOPE unit provides top views with up to 700 x magnification. ERSA's vision for the future of quality assurance are total hardware/software solutions. With the **ERSA ImageDoc Quality Assurance Software**, a tool was developed revolutionizing process control together with the ERSA inspection systems.



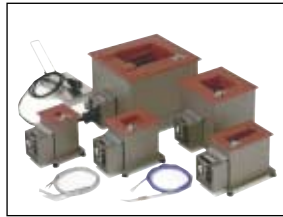
ERSASCOPE

Anything you need for soldering: process materials and practical accessories from ERSA



Solder wire dispenser ERSA SR 100

This solder wire dispenser is the ideal addition to any soldering workbench. It is designed to handle different reel sizes (250/500/1,000 g). The variable solder wire guide accommodates different solder wire diameters and allows the solder wire feed to be adjusted quickly to the correct position without the need to move the ERSA SR 100. The ERSA SR 101 add-on is for using a second solder wire reel.



ERSA solder baths

Electrically heated melting pots, ideal for dip-tinning wick ends, connection wires and cable plugs. They are available for 40 up to 11,000 g of solder.



ERSA solder wire feed unit

The ERSA LVE electric solder wire feed unit feeds solder wire precisely and functions as your missing "third" hand during soldering work. The solder wire feed can be adjusted continuously.

The solder wire is fed to the soldering tip in a teflon tube, which ensures that it will not jam during operation. There is no longer need to go through the laborious process of threading the wire into the feed when changing the solder wire reel.

The solder wire can also be triggered by means of the optional foot pedal switch.



ERSA solder wire

In accordance to various soldering applications, ERSA solder wire is available in different alloys and diameters.



ERSA desoldering wicks

ERSA desoldering wicks are indispensable for effectively and gently removing flux and solder residue via capillary action.



ERSA SMD-solder paste and flux cream

Ideal for SMD-soldering even on finest PCBs, especially for ERSA SolderWell soldering.

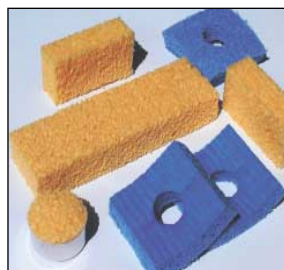
Temperature measuring device ERSA DTM 100

This tool is ideal for calibrating temperature values in accordance with ISO 9000ff. Thanks to its innovative technology, the temperature measuring device measures temperature quickly and accurately even on the finest of soldering tips.



ERSA holders

For safe and ergonomic positioning of the soldering iron while heating-up or having a break.



ERSA sponges

Sponges to clean the hot soldering tip from solder residues right before soldering.

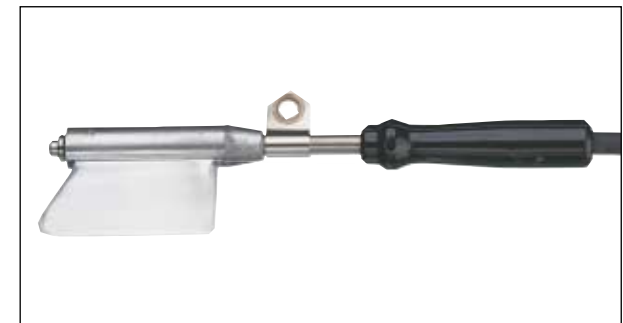


ERSA tip exchanger

For safe and rapid changing of nearly all ERSA soldering and desoldering tips. Especially designed for series 212 and 422.

Cut, weld and seal with this plastics welding device

This plastics welding device is used to cut, weld and seal thermoplastic foils, tissues and sealing profiles. Rope ends are secured against untwisting thanks to automatic bonding during the cutting process. Where precise working temperatures are required, we recommend the use of a soldering station together with adequate inserts.



ERSA Tiffany solutions



ERSA ANALOG 80 T - ERSA Tiffany station for professionals

Thanks to the precise temperature control, overheating of glass parts and copper foils can be ruled out when using ERSA Tiffany soldering stations. They offer enormous power reserves comparable to those of uncontrolled soldering irons.

The ERSA SENSOTRONIC temperature control system, with the thermocouple in the front of the soldering tip, provides extremely high temperature stability. With 290 watts, the powerful ERSA soldering iron heats up from

room temperature to 280°C in only 60 seconds and only weighs an incredible 50 grams.

The many internally heated ERSADUR-long-life soldering tips, designed in accordance with Tiffany requirements, have an amazingly long service life.

Their special design allows optimal heat transfer, according to the selected working temperature, resulting in nicely built-up or flat edges.



Fig.: ERSA ANALOG 80

ERSA ANALOG 80 T for Tiffany soldering



First class with heavy mass: ERSADUR Tiffany soldering tips

ERSADUR soldering tip types GD, LD and MD of the extensive 832 line are perfectly suited for Tiffany applications.

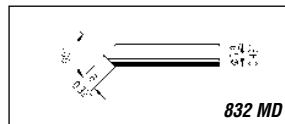
Due to their shape and their heavy mass combined with the resulting heat storage capacity, the gaps between the glass parts to be soldered can easily and quickly be filled with solder. The ERSADUR treatment guarantees a long service life



832 GD



832 LD



832 MD

ERSA CLEAN AIR solder fume extraction



The auxiliary equipment used in soft soldering, such as fluxes or glues, release noxious gases when heated. Irritation of the eyes and mucous membrane, dizziness and allergies are only some of the associated health hazards. It is important to intercept the harmful particles as near as possible to their source in order to reduce health hazards.

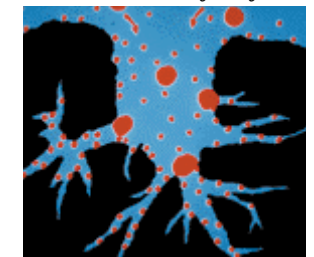
ERSA CLEAN AIR extraction systems perfectly follow this principle: Solder fume can be easily extracted directly at the soldering tip by means of the EASY TIP extraction systems. EASY ARM extraction systems extract solder fumes via an extraction arm. Various extraction nozzles and hoods are available to optimally

adapt this arm to the respective conditions at the workbench. The particle filters used have a filtration efficiency better than 99.9 % according DOP testing regulations. Dangerous gases are filtered up to 99 % with activated carbon filters. Detailed information can be obtained on request.

ERSA CLEAN AIR TIP EXTRACTION



Activated carbon filters dangerous gas



ERSA - Your competent soldering partner

ERSA NEW DIMENSION and ERSA PROFI-LINE products

There are people who are driven to perfection in what they do - athletes, artists and even engineers are among them. For us at ERSÄ for example, everything is centered around soft soldering. We want to make soldering as simple and as valuable in

quality as possible for our users with sophisticated and economical solutions. By making improvements and innovations, we want to constantly improve and promote this effort.

Just as automobiles in series production profit from Formula 1 race cars, ERSÄ hobby users profit from the soft soldering technology which we offer professionals in trade and industry. The basis for this is our complete line of soldering and desoldering products, which can be found with all necessary technical and order data in our two catalogues, the "winning combination":

"NEW DIMENSION"
and
"PROFI-LINE"



ERSÄ Know-How seminars

More than ever, cost effective production and exceptional quality are the basis for competing successfully in today's world. ERSÄ soldering technology seminars are the ideal forum for providing training and an exchange of knowledge and experience. Leading experts in the field, with both scientific and practical backgrounds, give an insight into the current issues in theory and practice. ERSÄ seminars are both informative and practical for small, medium and large sized operations.



Technology transfer

In order to implement technology transfer, we offer free, specific process descriptions on SMD soldering and desoldering, as well as interesting scientifically well-researched technical articles on the latest technologies and developments in the field.

These represent an ideal aid to all users and are an integral part of continuing service.

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NEW DIMENSION
CATALOGUE

ERSÄ
PROFI-LINE
CATALOGUE

Ein starkes Doppel:
ERSÄ NEW DIMENSION
und ERSÄ PROFI-LINE Katalog



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GLOBAL CONNECTIONS

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