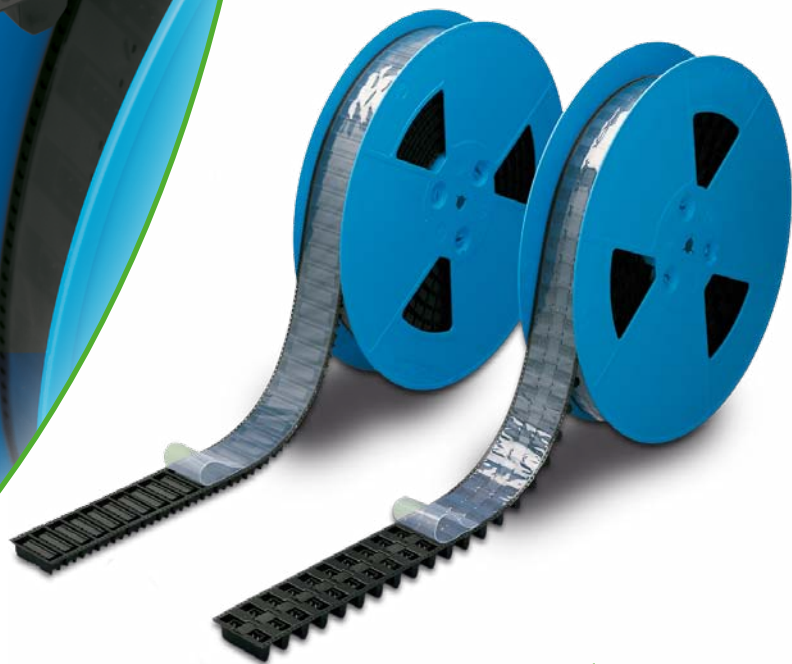
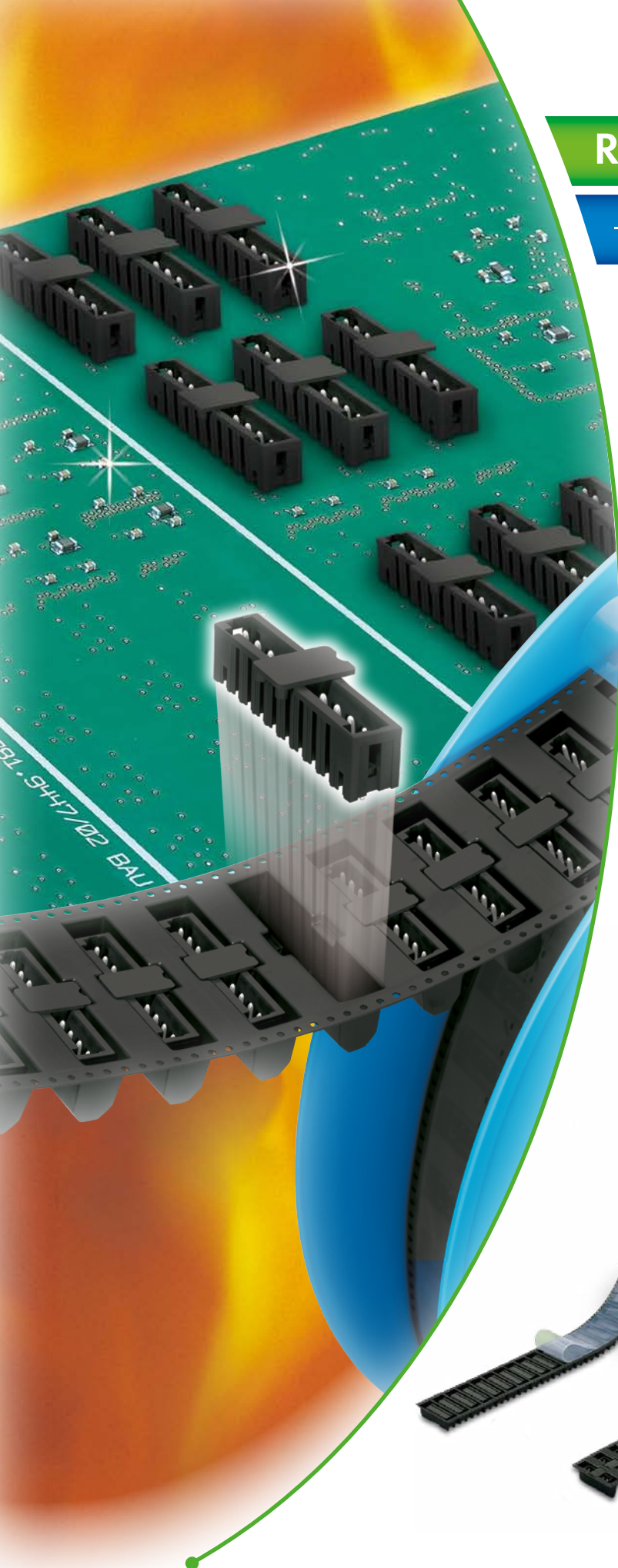


Reflow Technology

– Product Overview –



WAGO[®]
INNOVATIVE CONNECTIONS

Requirements for THR Components

THR Components

Components suitable for THR process must withstand higher temperatures than for standard wave soldering. Therefore, WAGO THR components are made from high-temperature-resistant material and designed to provide optimal heat supply to the soldering point. These components have a suction area for automated pick-and-place assembly and are also available in tape-and-reel packaging. Therefore, WAGO THR components can be fully integrated into SMT manufacturing processes for greater cost savings.

Materials

Plastic material for THR components must resist a maximum peak temperature of 260°C for 10s (temperature profile acc. to DIN EN 61760-1) and match the PCB base material's coefficient of thermal expansion (CTE) to prevent warpage of both component and PCB. WAGO PCB terminal blocks and connectors are molded of glass fiber-reinforced insulation plastic capable of withstanding temperatures up to 260°C. The selected material has the required elasticity and provides high dimensional stability for the entire range of pin spacing. It is therefore ideal for both lead-free and two-time reflow soldering processes.

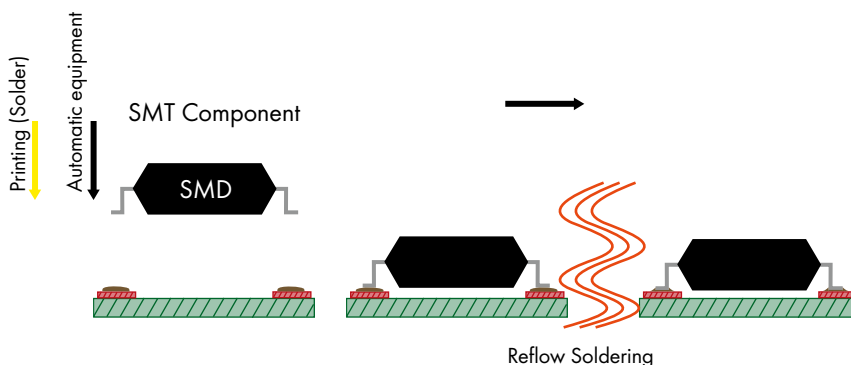
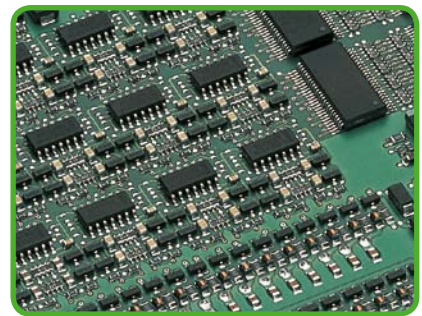
Design

The streamlined design (length) of THR component pins prevents the solder paste from being extruded during assembly. This may impair the ability of the paste to reflow properly. The free space around the solder pins ensures optimal heat flow to the solder joint, providing yielding an excellent bond. Stand-offs or ribs on both left and right sides of the pin prevent the insulation body of the components and the solder paste from coming into contact with each other.

Surface Mount Technology (SMT)

Surface Mount Technology (SMT) means soldering electronic components directly onto PCB surface pads without drilling holes. The basic SMT process consists of applying solder paste to the PCB via solder dispensing equipment, screen or stencil printing.

SMT assembly is performed using fully automated placement machines. The SMD components are soldered to the board in infrared (IR), convection or vapor phase ovens.



SMT



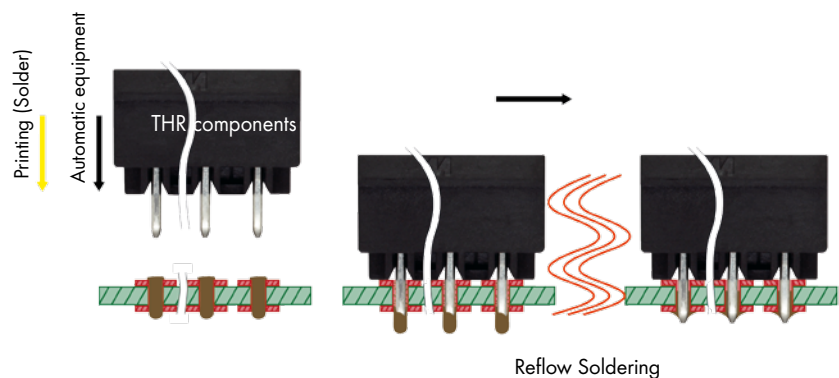
Both material and design provide best processing performance at high temperatures.

Through-Hole Reflow (THR)



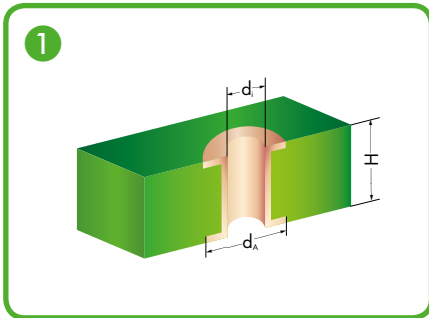
Mechanically stressed THR components, like PCB terminal blocks and connectors, are placed into metal-plated holes filled with solder paste. They can then be soldered along with SMD components using the time-saving and cost-effective reflow soldering process.

WAGO THR components are specifically designed to allow fully automated assembly and withstand high reflow oven temperatures.

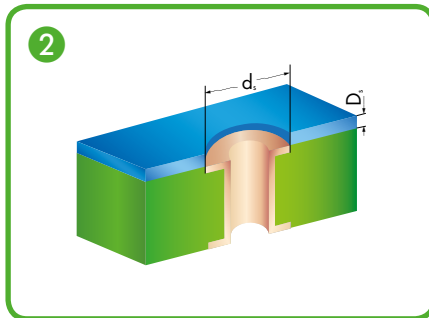


THR

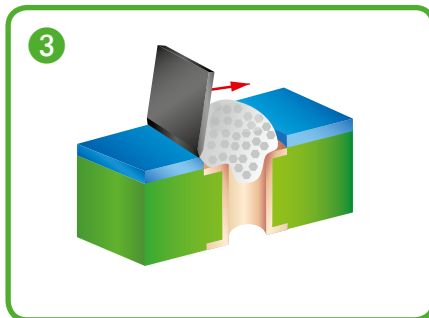
THR PCB Layout Parameters



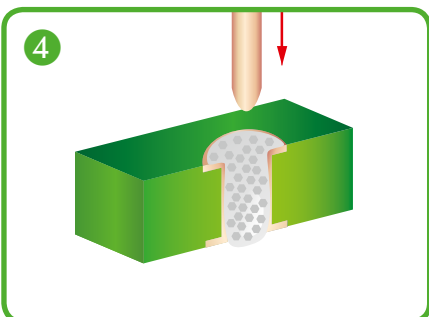
Metal-plated PCB bore hole



SMD positioning pattern



Solder paste application



Component assembly, automatic/by hand

Series	d_i (mm)	d_A (mm)	H(mm)	d_s (mm)	D_s (μ m)	d(mm)	L(mm)
218	$1.1^{+0.1}$	1.9	< 2	1.8	150	0.9	2.8
231 (1 x 1 mm)	$1.4^{+0.1}$	2.5	< 2	2.4	150	1.2	2.4
231 (1.2 x 1.2 mm)	$1.7^{+0.1}$	2.8	< 2	2.7	150	1.5	2.4
236	$1.1^{+0.1}$	2.2	< 2	2.1	150	0.9	3.6
250	$1.1^{+0.1}$	2.0	< 2	1.9	150	0.9	3.6
713	$1.2^{+0.1}$	1.9	< 2	1.8	150	1.0	2.4
733	$1.2^{+0.1}$	1.9	< 2	1.8	150	1.0	2.4
734	$1.4^{+0.1}$	2.5	< 2	2.4	150	1.2	2.4
2081	$1.1^{+0.1}$	2.0	< 2	1.9	150	0.9	3.6
2091 (Male Headers)	$1.2^{+0.1}$	1.9	< 2	1.8	150	1.0	2.4
2091 (Female Headers)	$1.2^{+0.1}$	1.9	< 2	1.8	150	0.85	2.4
2092 (Male Headers)	$1.6^{+0.1}$	2.3	< 2	2.2	150	1.4	2.4
2092 (Female Headers)	$1.5^{+0.1}$	2.2	< 2	2.1	150	1.36	2.4

d_i : Inner diameter of metal-plated PCB bore hole

d_A : Outer diameter of metal-plated PCB hole*

H: PCB thickness

d_s : Pattern hole diameter

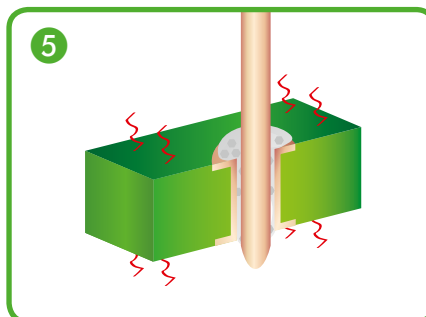
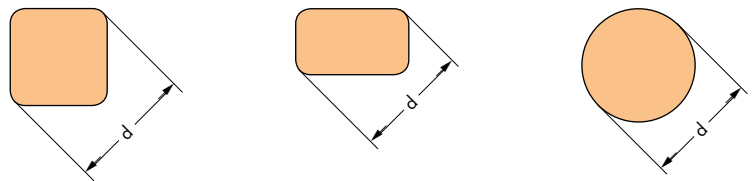
D_s : Pattern thickness

d: Pin diagonal/diameter

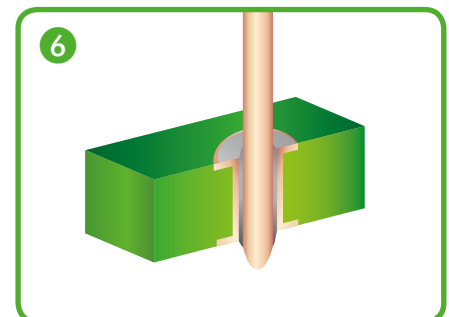
L: Pin length

*When laying out the metal-plated bore holes, the clearance and creepage distance requirements - as specified in the equipment standards - must be considered.

Solder pin design:



Reflow soldering process



THR soldering joint

THR products in tape-and-reel packaging
acc. to IEC 60286-3



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