Cleaning test – report

FLUX RESIDUES removal

Solder paste:

Indium8.9HF-1
Indium8.9HFA

PCB type: customer's PCB samples

*Cooperation of **DCT** as specialist for cleaning applications and producers of variable materials for electrotechnical industry helps to make our joint customer completely satisfied with his process. Thanks to this testing we are able to improve our current processes or develop new.*

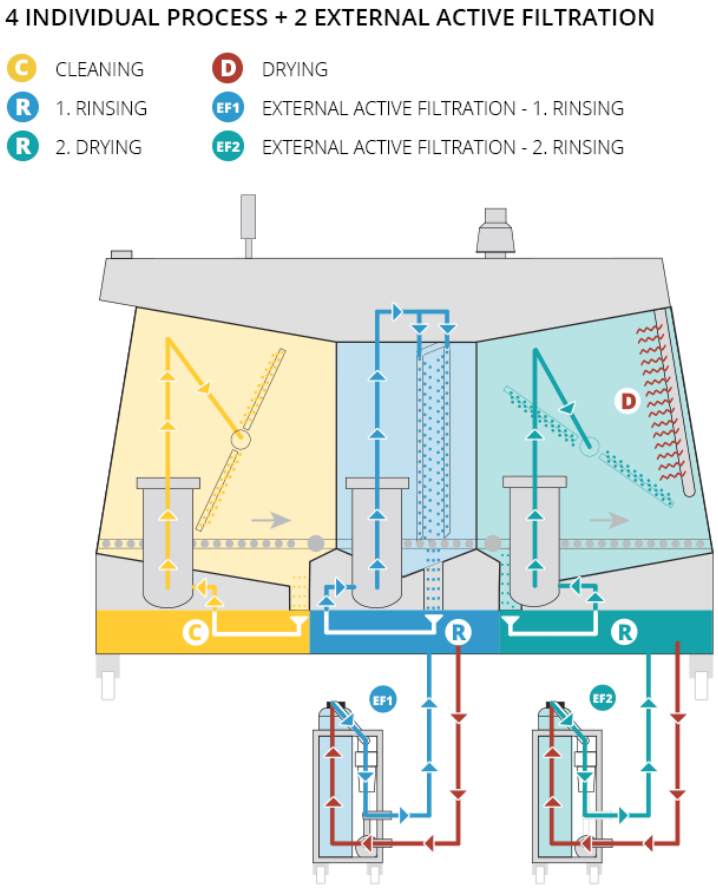
About DCT objective testing:

DCT is Czech company that develops and produces cleaning processes including cleaning machines and cleaning fluid for electrotechnical industry. This enables us to be able to suit the whole process to customer's specific needs. To be able to provide the best solution for our customer, we cooperate with producers of materials used in electrotechnical industry. We do this testing to be compatible and to be able to remove excess or residues of material on the surface which are undesirable.

What is our standard test procedure for removing flux residues?

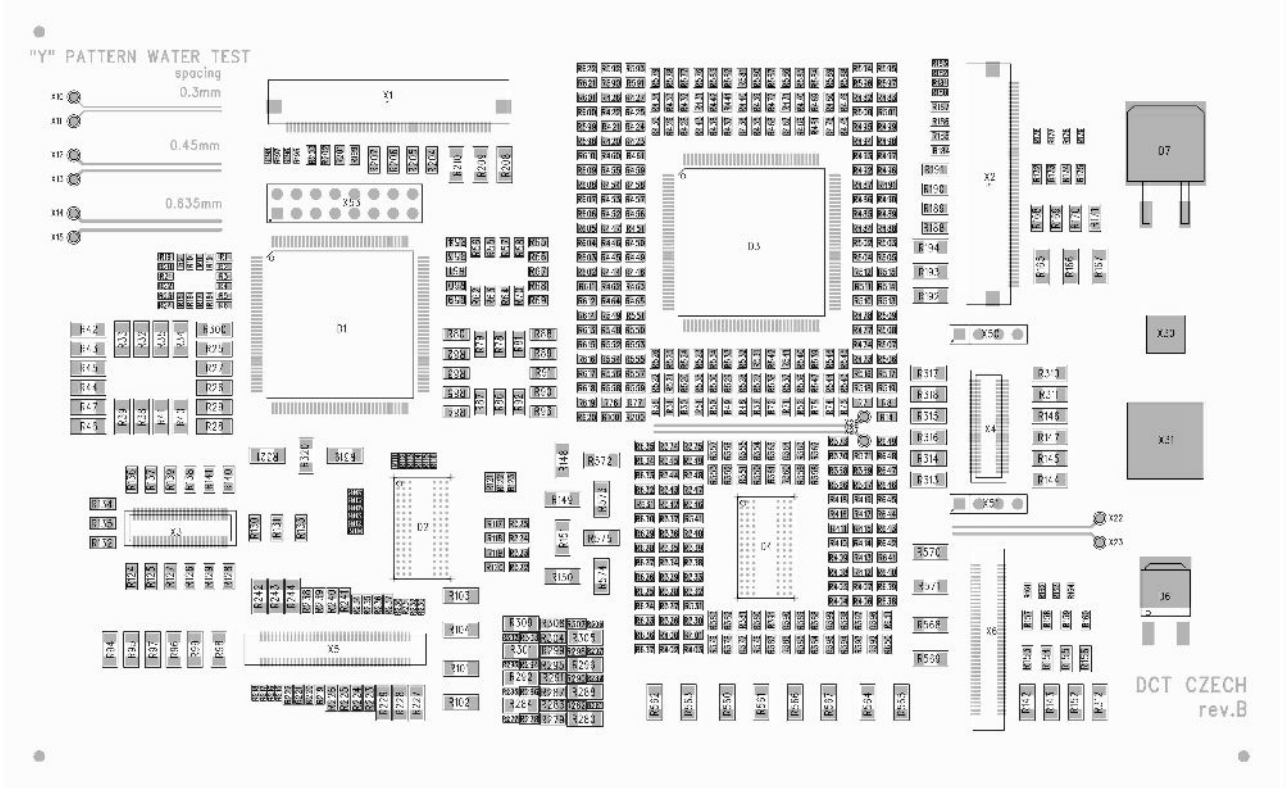
Based on our long experiences we use the most popular, the most successful and broad cleaning process for flux removal from assembled PCB. This process is

vertical high pressure spray in air cleaning technology in
cleaning machine Injet TWIN 388 CRRD and cleaning fluid Decotron CP 381
at temperature 50°C for 10 min. Cleaning is followed by two rinsing in DI water at conductivity 1-2uS with continual deionization and hot air drying.
(More types of cleaning fluid and different types of cleaning machines are tested on request.)



How do we test cleaning flux residues from PCB?

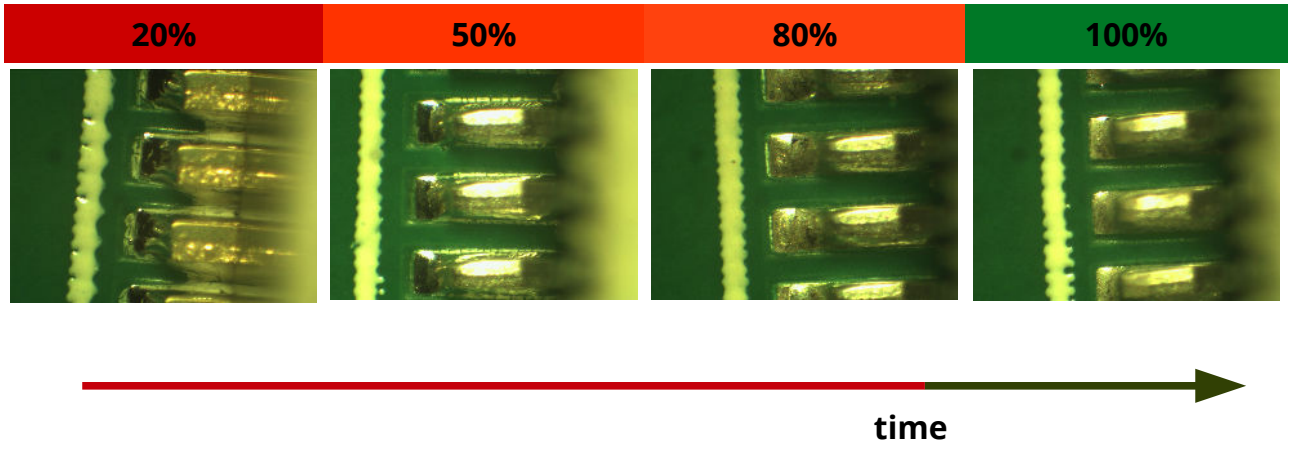
1. First we **let to assemble several DCT testing boards** using desired solder paste. DCT testing board contains more than 600 components and is designed to be the most complicate for cleaning as is possible. We test shadowing effect and effectivity of cleaning components which are difficult to clean.



We can also make conclusions of cleaning possibilities of desired solder paste based on **our customer's PCB** which allow us to use their own real PCB for testing.

2. Before test we make detailed magnified **photos of flux residues** on the surface after soldering. In next step we start testing cleaning in machine using **our standard cleaning process setting**.

3. If we are able to remove all flux residues, we continue with **reducement of cleaning time**. It is also possible to play with temperature, different cleaning fluid and more types of cleaning technologies if requested.



All conclusions are based on **visual inspection** under microscope and **ionic contamination testing** before and after cleaning.

We require ionic contamination <0,500 ug NaCl/cm^2 after cleaning and no visible flux residues for designation as an high suitable cleaning process.

Requested test procedure for our customers using Indium Paste:

Standard test procedure using cleaning fluid **Decotron CP 381, Decotron CP 359, Decotron C55S** for cleaning flux residues after soldering with paste **Indium8.9HF-1** and **Indium8.9HFA** on customer's PCB samples.

Result

Tested Cleaning fluid and its properties	Minimum cleaning time (at 50°C)		Suitablity*	
	Indium8.9HF-1	**Indium8.9HFA**	**Indium8.9HF-1**	**Indium8.9HFA**
Decotron CP 381 Concentration: 20% Water based, anticorrosive additives (clean and protect technology).	15 min	15 min	High	High
Decotron CP 359 Concentration: 20% Water based anticorrosive additives (clean and protect technology).	-	15 min	Not suitable	High
Decotron C55S Concentration: 100 % 50% Water based & 50% Alcohol based	10 min	Not tested	High	Not tested

* See photodocumentation in attachement.

This result only shows ability of cleaning tested sample. All setting must be verified and customized for individual PCB. Rinsing and drying time and temperature is set individually. Result from this test should be used as a guide to optimize specific cleaning process. For deeper study or trial test please contact DCT representative.

Integrity testing

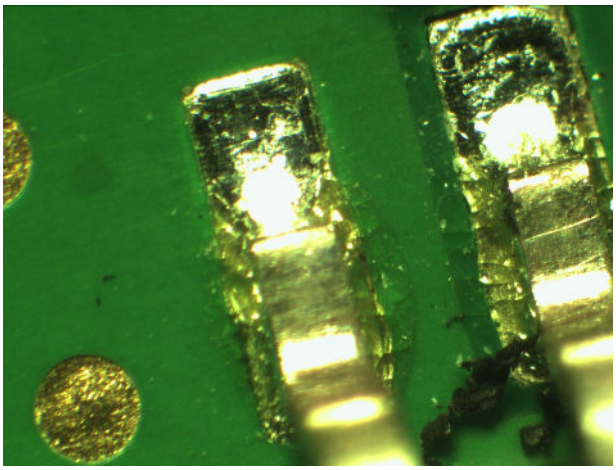
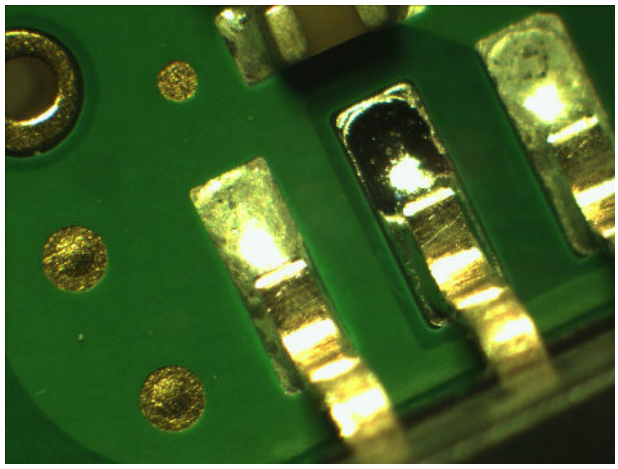
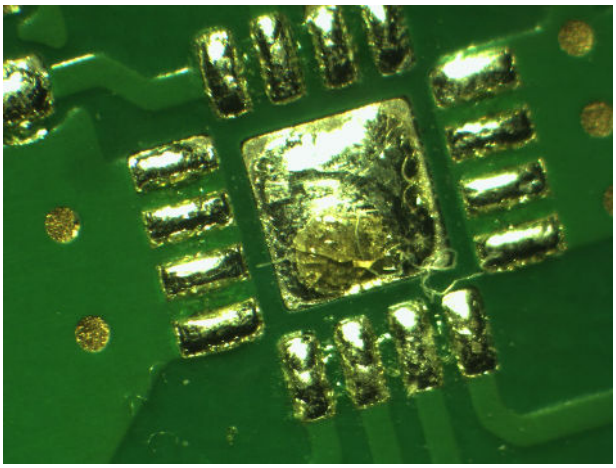
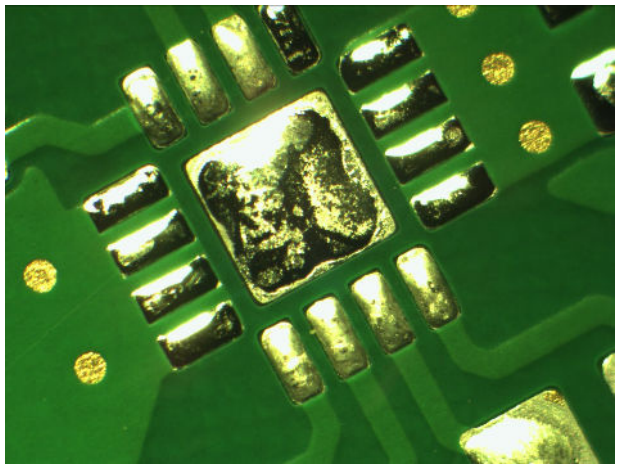
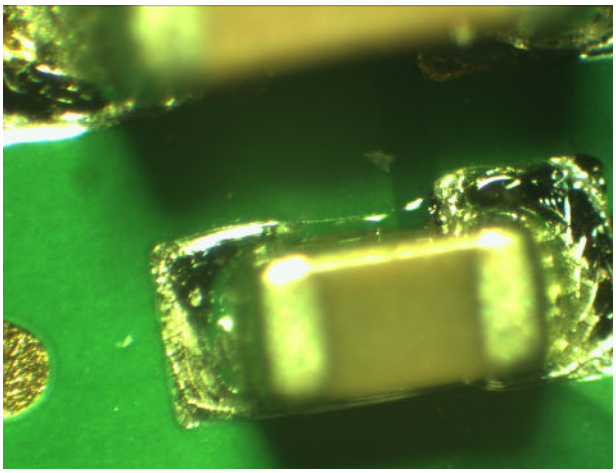
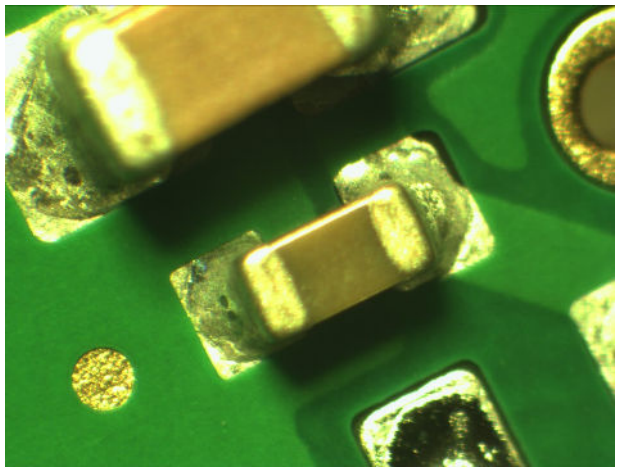
All tested materials, documents, photos and ROSE reports from test are thoroughly concluded to make this report and saved in DCT for future potential needs and are available on request for verification to customer or producer. DCT certifies that all data within this report are true and accurate.

Test was performed by:

Ing. Lenka Musilová / **laboratory specialist** / Lm@dct. cleaning
Date of the test: 12.5.2016

Attachement 1:

Indium8.9HFA, cleaning result for high suitable process

PCB BEFORE	PCB AFTER
	
	
	

Attachement 2:

Indium8.9HF-1, cleaning result for high suitable process

PCB BEFORE	PCB AFTER