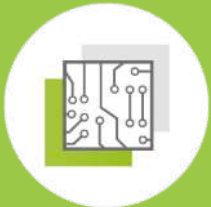


CLEANING, SYSTEMS & PROCESSES IN ELECTRONIC'S OEM

V.ESTEVE

09/04/2023 - BARCELONA



SOLDERING



CLEANING



COATING



COOLING



INSPIRING INNOVATION

CLEANING RANGE

Why cleaning ?

WHY ?

- To remove contaminants
- To prepare the surface for the next production steps
- For esthetics
- For reliability
- To provide surface properties



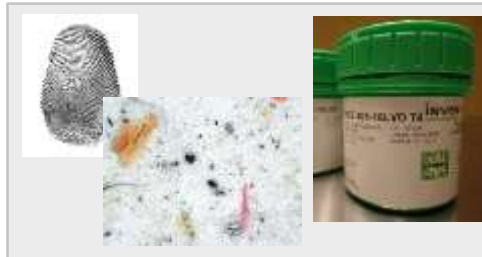
WHAT ?

In electronics:

- Fresh solder paste
- Flux, paste residues
- burnt residues on frames, carriers...

In mechanics:

- Oil / Grease
- Particles
- Coating
- ...



HOW ?

Product:

- Solvent
- Detergent

Process:

- Aspersión
- Immersion
- Vapor phase
- ...



FOR WHOM ?

Electronics:

- Semiconductor
- Aeronautics
- ...

Mechanics:

- Automotive
- Aeronautics
- Medical
- ...



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1 CLEANING in Electronics – some history

2 CLEANING flux and paste residues
Process and Products

3 How clean is clean?

4 Stencil cleaning - Fresh pastes
and glues

5 Maintenance cleaning

6 Contact with customers
Key questions



Cleaning in electronics Some history

CLEANING IN ELECTRONICS

History of cleaning in electronic application

- Water
- 1,1,1-Trichloroethane (CFC)
- Freon TMS (CFC)

Before 1987

1987



Treaty, 11 countries
ban of the use of certain CFC's (Chlorinated FluoroCarbons) based materials

→ Need to end production within 10 years

Get rid of the whole
solvent question

Water based

Alternative
solvents

Components are closer (« fine
pitch ») → even a small amount of
residue can be a problem →
electrical chemical migration

No-clean

Low flux residue,
with no impact
during use
« No-clean flux »
« No-clean paste »

Miniaturization

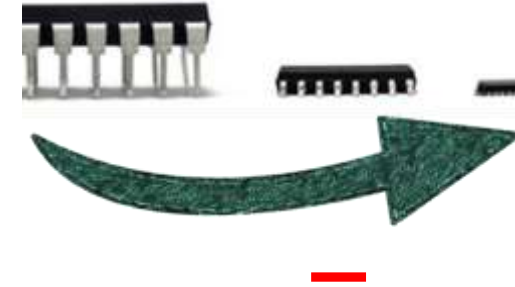
**We still need to
clean!**

CLEANING IN ELECTRONICS

Miniaturization



INNOVATION
Miniaturization



- ✓ Power gain
- ✓ Increase of data processing
- ✓ Cost reductions
- ✓ Reduction of dimension: gain of space, fine pitch, low stand off ...

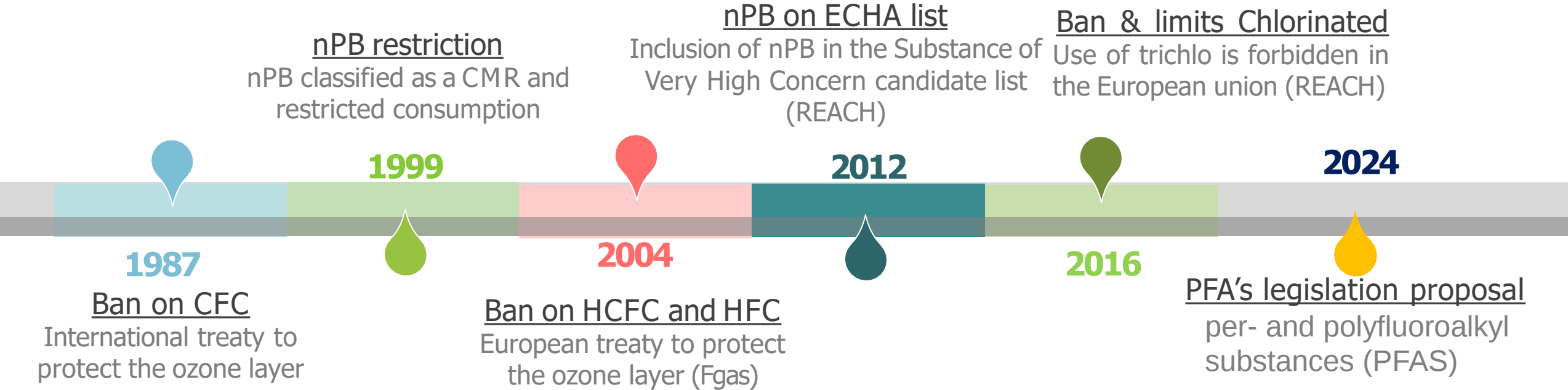


- x Law of physics
- x Chemical oxidation
- x Electro-chemical migration
- x Thermal performance
- x New characteristics due to small size

STANDARD TECHNOLOGY		PUS TECHNOLOGY			
TYPE 3	TYPE 4	TYPE 5	TYPE 6	TYPE 7	TYPE 8
25-45μ	20-38μ	15-25μ	5-15μ	2-11μ	1-8μ

CLEANING IN ELECTRONICS

Legislation and regulation



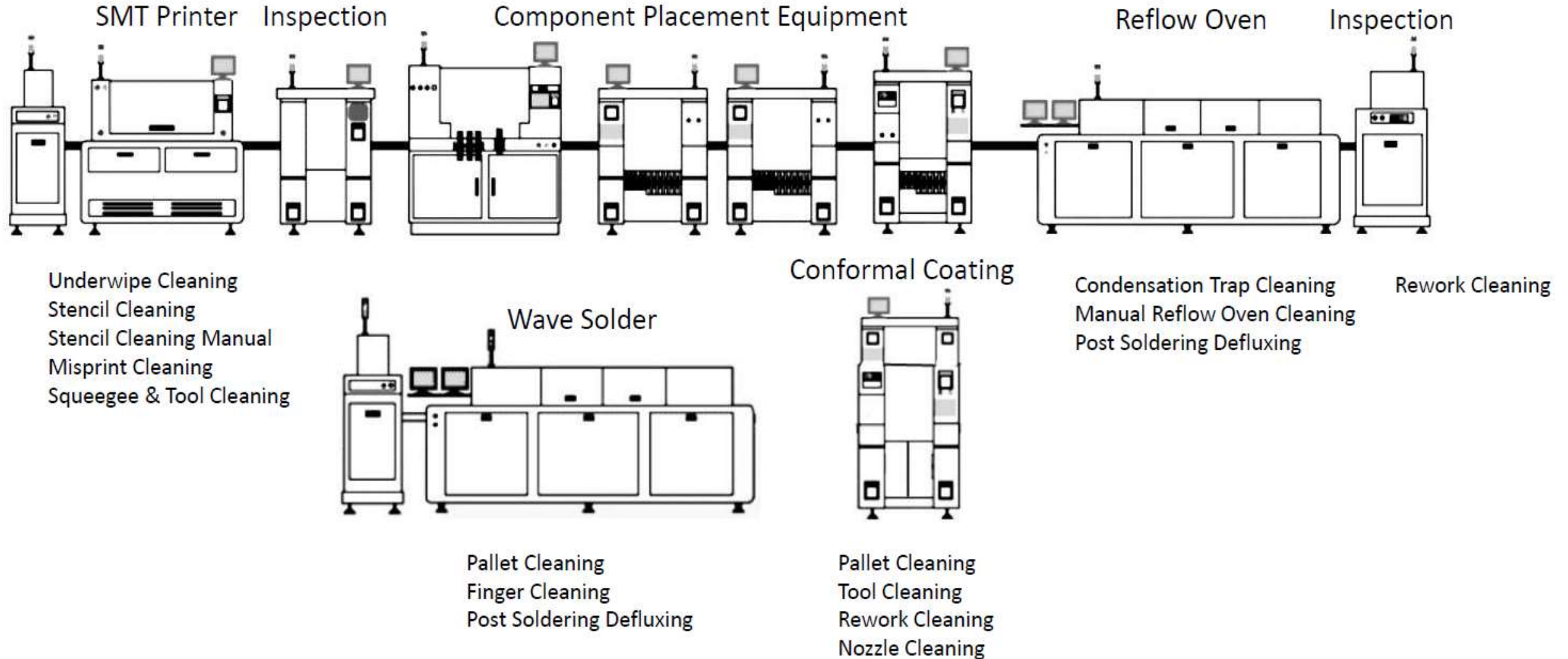
European legislation:

- * ROHS
- * REACH (SVHC = npb)
- * F GAS (HFC, PFC)
- * CLP, GHS....
- * PFA's..



CLEANING IN ELECTRONICS

Process manufacturing pcb's





Cleaning flux & paste residues – Manufacturing

CLEANING RANGE

Solvent VS Aqueous products

Solvent

- + No water treatment
- + Long bath life
- + Short cycles – Fast drying
- + Good finishing
- + Recyclable solvent
- Limited efficiency with water soluble pollutants
- Regulation
- Compatibility with polymers

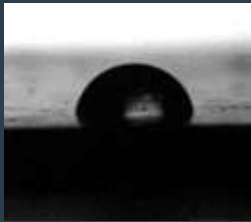
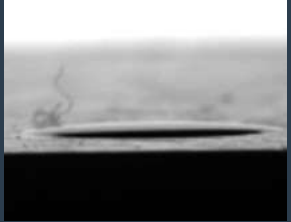
VS

Water based

- + Good efficiency on water soluble pollutants
- + Low cost machine
- + Low cost product
- + Compatible with all polymers
- Compatibility with metals
- Process follow-up
- Long cycle time
- Water consumption and treatment
- Bath life

CLEANING RANGE

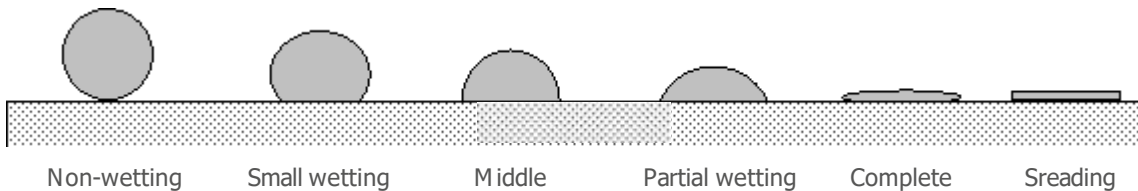
Solvent VS Aqueous products – contact angle

					
DI water	Tap water	Inventec detergent Promoclean TP 50 at 5% in DI water	Inventec solvent Topklean MC 20A	Inventec solvent Topklean EL 20P	Inventec solvent Promosolv DR3

Contact angle:
180°

90°

0°

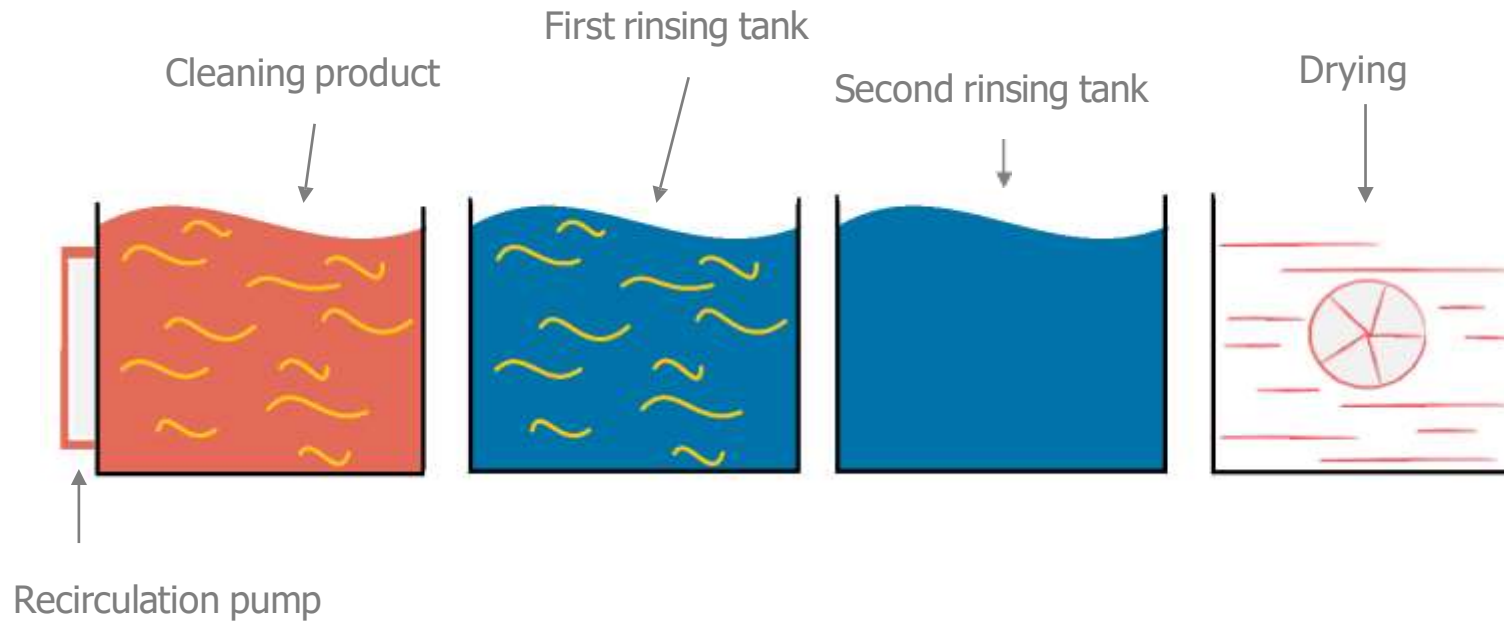


Low surface tension liquid:
→ good penetrating power
→ high cleaning and rinsing performance

Can easily penetrate tiny spaces between boards and components => « low-stand-off components »

PROCESS

WATER BASED – Immersion process



	Function	Product	Time
STEP 1	Cleaning	PROMOCLEAN TP	15 min
STEP 2	Rinsing	Tap water (DI water in electronics)	5 min
STEP 3	Rinsing	DI water	5 min
STEP 4	Drying	Hot air	10 min

PARAMETERS:

- Concentration of the cleaner
- Temperature
- Mechanical action (US, bubbling, immersed jets...)
- Cleaning time
- ...

TIME:

30-90 min

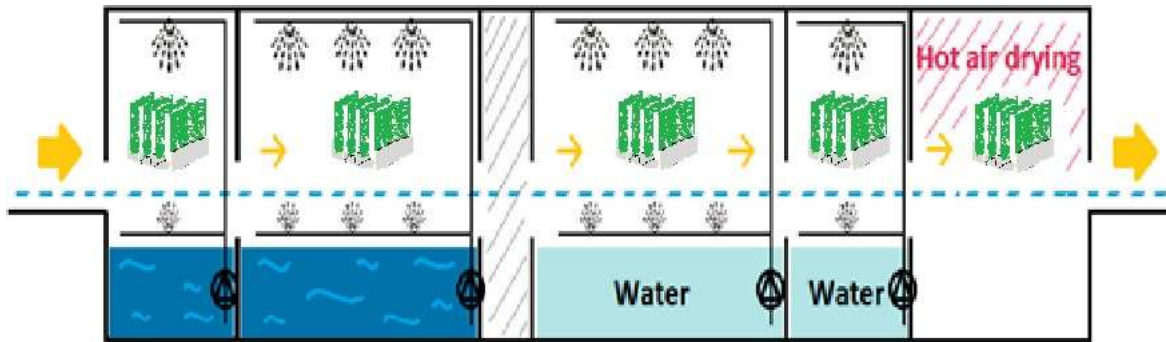
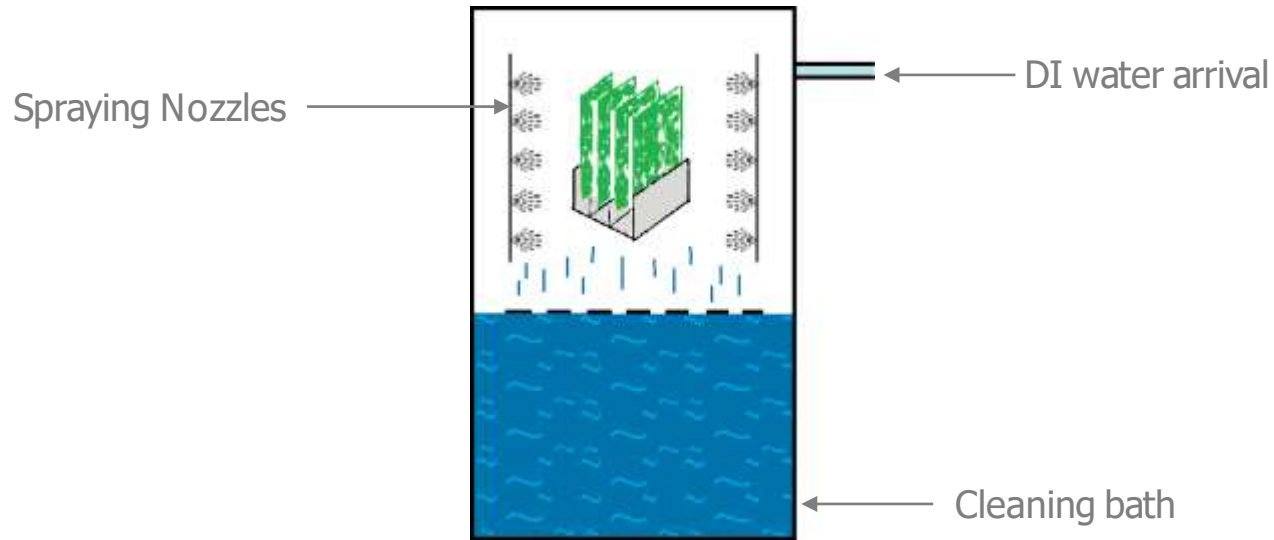
BATH FOLLOWING:

PCA kit



PROCESS

WATER BASED – Spraying process



PARAMETERS:

- Concentration of the cleaner
- Temperature
- Pressure
- Spray nozzles direction
- Cleaning time
- ...

COMPATIBLE PRODUCTS:

- **PROMOCLEAN DISPER**

TIME:

30-60 min

BATH FOLLOWING:

PCA kit

	Function	Product	Time
STEP 1	Cleaning	PROMOCLEAN DISPER	15 min
STEP 2	Rinsing	Tap water (DI water for Electronics)	5 min
STEP 3	Rinsing	DI water	5 min
STEP 4	Drying	Hot air	10 min



PROMOCLEAN DISPER 707

ADVANTAGE AND CONDITION OF USE

MAIN ADVANTAGES:

- Can clean most of our Soldering products range
- No foam
- Not DG (dangerous goods)
- Compatible with copper, aluminum, stainless steel etc.
- Compatible with standard plastics and elastomers used in electronic applications
- Compatible with several cleaning machine
- Halogenated compound free

MACHINE: Batch spraying machine or Immersion with immersed jets

CONCENTRATION: 15% – 25% (recommended 20%)

TEMPERATURE: 50°C – 60°C

PROCESS FOLLOW-UP: with a handle refractometer



CLEANING RANGE – UNDER VACUUM CLEANING

CATEGORY

TYPE OF CHEMISTRY

NAME

PROCESS

SOLVENT

ORGANIC

Hydrocarbon
Modified alcohol

TOPKLEAN

Topklean EL20D

Immersion
Vacuum

➤ Mostly used for degreasing but can be used for defluxing applications too

PRODUCT	SELECTION CRITERIA
TOPKLEAN MC 20D	Oxygenated / Removal HC OILS / Aeronautic homologation / following bath offered
TOPKLEAN MC 1153	Hydrocarbon / Removal HC OILS / Aeronautic homologation / following bath offered Can be used in pre-degreasing for flushing application If HC OILS with sulfonated compounds used at corrosion inhibitors.
TOPKLEAN MC 25	Oxygenated / Removal HC OILS / Aeronautic homologation / Lower cost
TOPKLEAN EL 20D	Oxygenated / Flux removal / Electronic application
TOPKLEAN ORGANIC	Oxygenated / based on waste vegetal materials / Greenway product / Dedicated for esters oils / Aeronautic homologation / <i>specific machine needed / ONLY IF MACHINE MANUFACTURER IS INTERESTING TO ADAPT ITS MACHINE.</i>

CLEANING RANGE – UNDER VACUUM CLEANING

Flux residues removal



- Topklean EL20D is mainly used in semiconductor, hybrid circuits and in some mil/aero electronics
- Example of use - power component manufacturing – Inventec high temperature leaded solder paste residue Ecorel HT 296T-85 is removed with Topklean EL20D
- Cleaning efficiency depends on flux chemistry
- Solvent is continuously (or semi-continuously) purified by distillation
 - Separation of pollution and solvent
 - Low consumption
- Two main advantages
 - Working under vacuum leads to a decrease of solvent boiling point = energy (and cost) savings
- Vacuum = no oxygen in process : SAFE PROCESS
 - ✓ combustion due to presence of oxygen cannot occur, inflammability is under control

INVENTEC solvents

Topklean range

Inventec **TOPKLEAN** product are used in combination with **HFE**

TOPKLEAN → cleaning performance

HFE → rinsing performance AND inerting performance

Function	Type of chemistry	Surface tension	Performance
TOPKLEAN range For cleaning	Hydrocarbon	25	Good organic cleaning
	Oxygenated	23	Good organic cleaning Good mineral cleaning
HFE for rinsing	Fluorinated	17	Good rinsing

→ **TOPKLEAN EL 20A**

→ **TOPKLEAN EL 20P**

→ **PROMOSOLV DR1**

INVENTEC range

- Topklean EL 20A
- Topklean EL 20P



CLEANING RANGE – CO-SOLVENT CLEANING

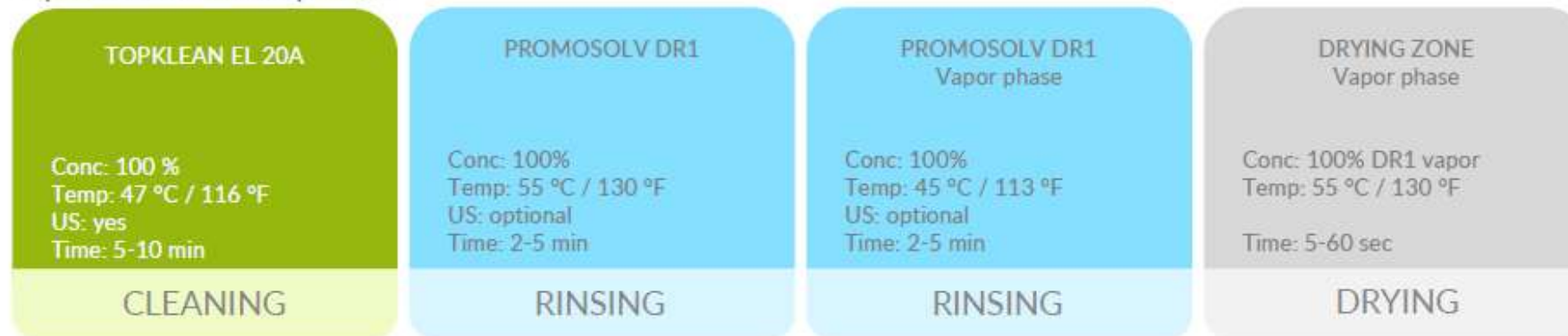
TOPKLEAN™ EL 20A

PROCESS EXAMPLE

Mixed co-solvent process



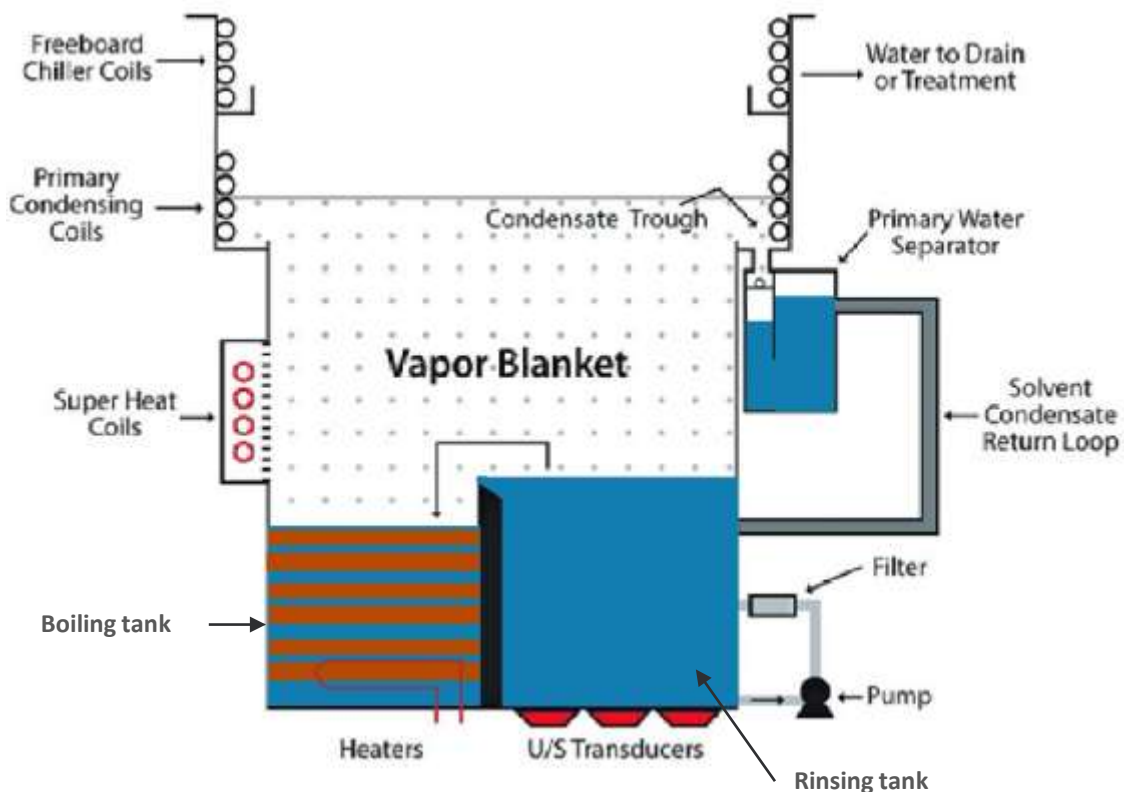
Separated co-solvent process



- Simple
- Efficient
- Fast
- Inexpensive
- Sustainable

PROCESS

SOLVENT – Co-Solvent process



PROMOSOLV DR1
TOPKLEAN EL20A

EXAMPLE WITH TOPKLEAN EL20A + PROMOSOLV DR1

Boiling tank

70% TOPKLEAN EL20A + 30% PROMOSOLV DR1
Tank temperature = Boiling point = 66°C

Rinsing tank

Pure PROMOSOLV DR1
Temperature = 50°C

Vapour

Vapour of PROMOSOLV DR1
Temperature = 55°C



Temperature gives indication for the composition

	Function	Zone	Time
STEP 1	Cleaning	Boiling tank	5 min
STEP 2	Rinsing	Rinsing tank	2 min
STEP 3	Rinsing	Vapour phase	2 min
STEP 4	Drying	Cold zone	2 min

TOTAL cleaning time 10-15 min

CLEANING RANGE

Solvent - All around HFE

Used in our co-solvent process with TOPKLEAN

TOPKLEAN product

- * Very good cleaning properties
- * Very bad rinsing properties

TOPKLEAN + HFE

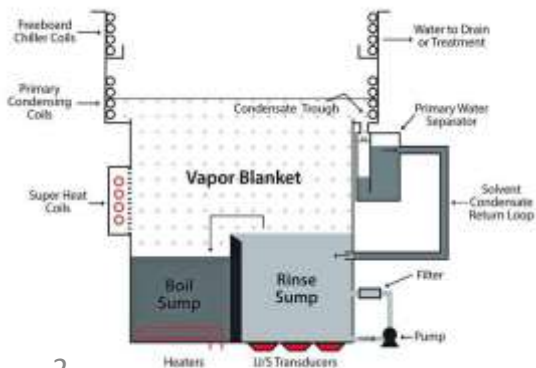
- * Very good cleaning AND rinsing properties

STEP 1 = Cleaning with TOPKLEAN

STEP 2 = Rinsing with HFE

Need to buy both product to set a co-solvent process.

- ✓ TOPKLEAN EL20A + HFE
- ✓ TOPKLEAN MC1153 + HFE
- ✓ ...



HFE

Hydro Fluoro Ether

- Very good rinsing properties
- Very good flame inhibitor
- No cleaning efficiency

Used alone

Can be used alone for very small contamination:

- Dust
- Finger particle
- ...

- ✓ PROMOSOLV DR3 = pure HFE
- ✓ Novec 71 IPA = HFE + IPA
- ✓ PROMOSOLV DR1 = Drop-in replacement of Novec 71IPA

Mono-solvent Process mainly used for general degreasing

Used in our PROMOSOLV range formulation

TDE = Trans Dichloro Ethylen

- * Very good cleaning properties
- * Flammable

TDE + HFE

- * Not flammable
- * Very good cleaning AND rinsing properties

PROMOSOLV products are used in vapor phase process which we call mono-solvent process.

Additives can be added to enhance some properties (IPA, etc)

- ✓ PROMOSOLV 70
- ✓ PROMOSOLV 70ES
- ✓ PROMOSOLV DA1
- ✓ ...



TDE is forbidden in Germany when used in machine



TOPKLEAN EL 10F

MULTI-PURPOSE ELECTRONIC CLEANER - MANUAL



EL 10F
Hand cleaning

FLUXES RESIDUE CLEANING, NON-REFLOWED PASTES & UNCURED GLUES
MANUAL SPRAY & NON HEATED IMMERSION PROCESS
DROP-IN REPLACEMENT FOR CLEANING WITH IPA

BENEFITS

TOPKLEAN EL 10F is a multi-purpose electronic cleaner for removal of flux residues, non-reflowed solder pastes and uncured glues in a manual spray or immersion cleaning process at ambient temperatures. It works fast and effective thanks to its excellent capacity to dissolve organic & mineral pollutants. Its higher flash point compared with Isopropanol (IPA) makes it a drop-in solution, which is safer to use and reduces the consumption substantially.

It's CMR, aromatic & halogen free, with no global warming potential. As it is a solvent, the product has no pH and will as such not damage sensitive metals or alloys.

It is a ready-to-use product that does not need to be diluted.

PERFORMANCE	- Product for wide applications in production or maintenance of electronics. - Fast & efficient cleaning - Easy to use
COST	- Low consumption because of medium evaporation - Reduces substantially equipment downtime
HSE	- No CMR substances - Low environmental impact: No GWP - Safety Flash point (FP=38°C / 100°F) compared to IPA (FP=12°C / 53°F)

SPECIFICATIONS

SPECIFICATIONS	VALUES	METHODS
Aspect	Colorless clear	Visual
Density at 20°C (g/ml)	0,830 ± 0,010	BRY-MO-026

CHARACTERISTICS

CHARACTERISTICS	VALUES
Flash point	38°C / 100°F
Relative evaporation rate (nBuAc=1)	0.15
Solubility in water	partially soluble
Water content (% weight)	< 0.1
Aromatics content (% weight)	< 0.01
Non volatil residue (g/100 ml)	<0.01
Viscosity @ 25°C / 77°F 302(mm²/s)	1.2
Vapour pressure @ 20°C / 68°F (hPa)	2.8
Boiling range (°C/°F)	150-170 / 302-338

How to clean ECOREL 305-16LVD residues after soldering

➤ SPACE, AERO, MIL, RF, ...

	Promoclean Disper 607	Promoclean Disper 707	Topklean EL20A / Novec 71IPA	Topklean EL 20D
Ecorel 305-16LVD	✓	✓	✓	✗

Before cleaning



After cleaning
with Cosolvent
EL20A



After cleaning
with Disper 707
In Aspersation





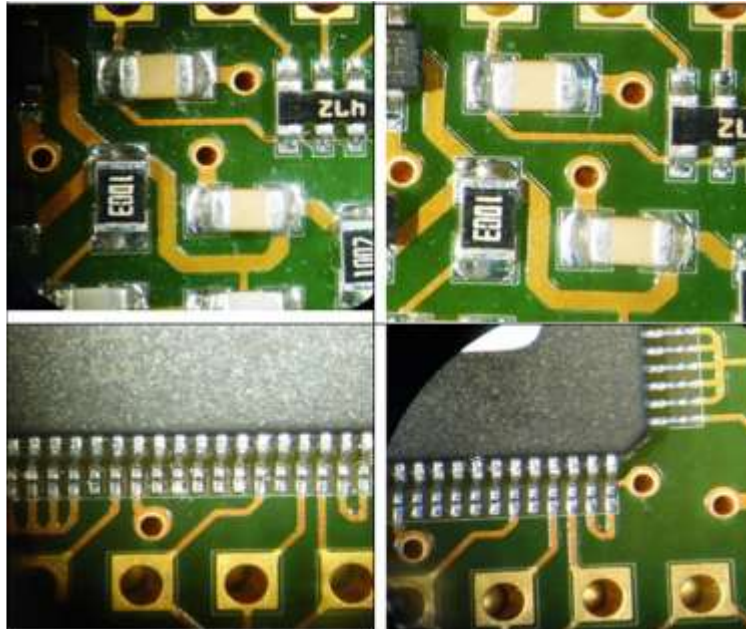
How clean is
clean ?

HOW CLEAN IS CLEAN ?

Visual / with magnification



Before cleaning



After cleaning

HOW CLEAN IS CLEAN ?

Ink test

INK TEST

The surface tension gives an idea on the possible oil remaining on the part

→ More than **38 dynes/cm** shows that the part is quite clean in general

→ Can be used on PCBA



ADVANTAGES AND INCONVENIENTS

- + Fast checking
- + Possible to have limit of acceptability
- Works mainly with on oils and greases
- Not very accurate

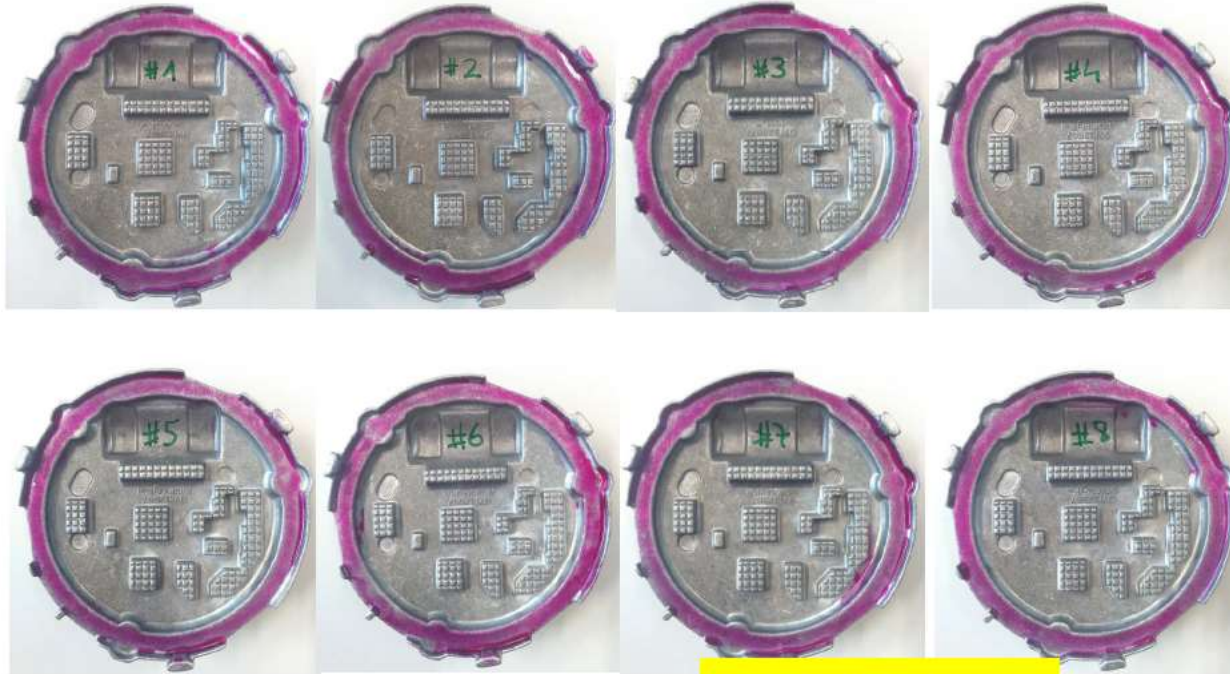
HOW CLEAN IS CLEAN ?

Ink test

INK TEST

The surface tension gives an idea on the possible oil remaining on the part

→ More than **38 dynes/cm** shows that the part is quite clean in general



100 % OK

ADVANTAGES AND INCONVENIENTS

- + Fast checking
- + Possible to have limit of acceptability
- Works mainly with on oils and greases
- Not very accurate

HOW CLEAN IS CLEAN ?

Ink test



BOSCH 		Testspecification Prüfvorschrift	Sach/Part-nr: 0 132 Y00 509 Ausgabe/Vers. Blatt/page: 1 of 4
Gegenstand: Object:	Prüfung der Oberflächenenergie an Mechanikteilen mittels Testtinten Testing of surface energy on mechanic parts with test ink		Entwicklungs-Nr.: 01
Bemerkung: Remark:			Kunde: Customer diverse Kd.-Nr.: Cu-nr. Project: diverse
Abteilung/Depart: ED/EEI Datum/Date: 12.12.2012 Genehmigt/appr: 			Kd.-Spezifikation: Kd.-Spez.-Ausgabe: Kd.-Spez.-Datum:

HOW CLEAN IS CLEAN ?

Ionic contamination – For electronic cleaning



IPC-TM-650
TEST METHODS MANUAL

IPC-TM-650 2.3.25

The ionic contamination test measures a dynamic conductivity.

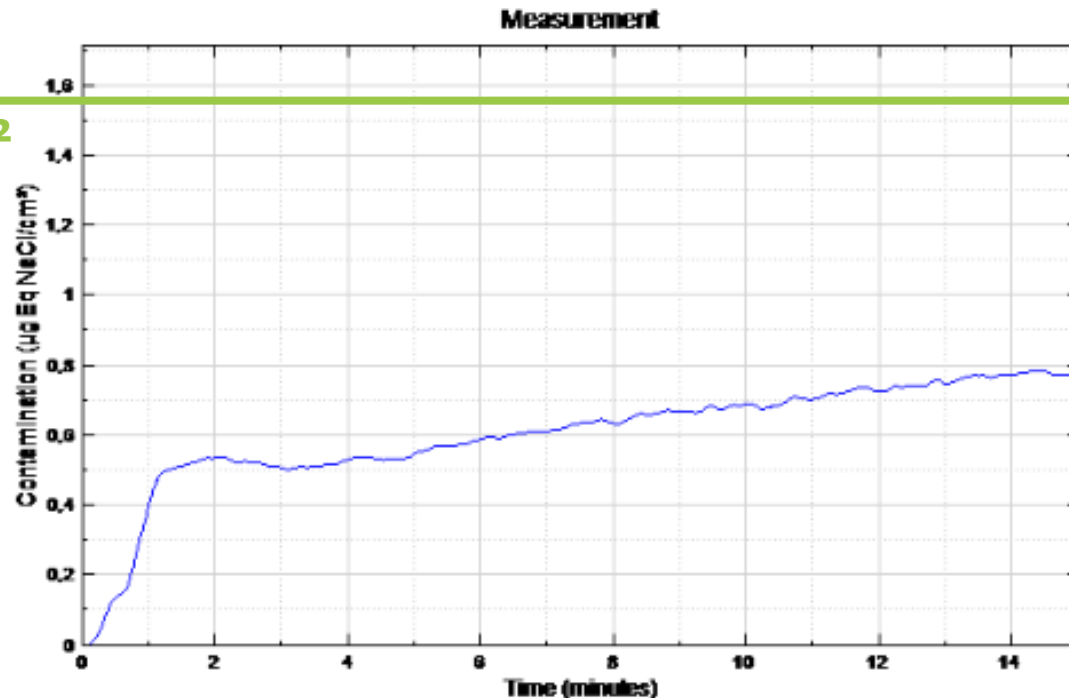
The PCB is immersed in a DI water/IPA solution in closed circulation.

Conductivity is measured for a given time.

Quantity of total ions is measured and the results is given in equivalent of NaCl per surface unit.

→ The IPC gives a limit to **1,56 $\mu\text{g Eq NaCl/cm}^2$**

1,56 $\mu\text{g Eq NaCl/cm}^2$



ADVANTAGES AND INCONVENIENTS

- + Accurate
- + Comparative analysis
- For electronics
- Does not measure local contamination



Cleaning in electronics - Stencil cleaning

TOPKLEAN EL7

UNDERSTENCIL CLEANING – INSIDE THE PRINTER



TOPKLEAN EL 7

Under stencil
cleaning in printer
systems

TOPKLEAN™ EL 7 is a solvent based cleaner formulated to remove all types of solder pastes from printing stencils using an automatic set up routine included in most SMT printers.

- High flash point
- Chlorine and halogenated solvent free
- Ready to use
- Compatible with all metals and alloys, as well as glass, plastics and ceramics
- Qualified for use inside MPM stencil wiper solvent system

SPECIFICATIONS

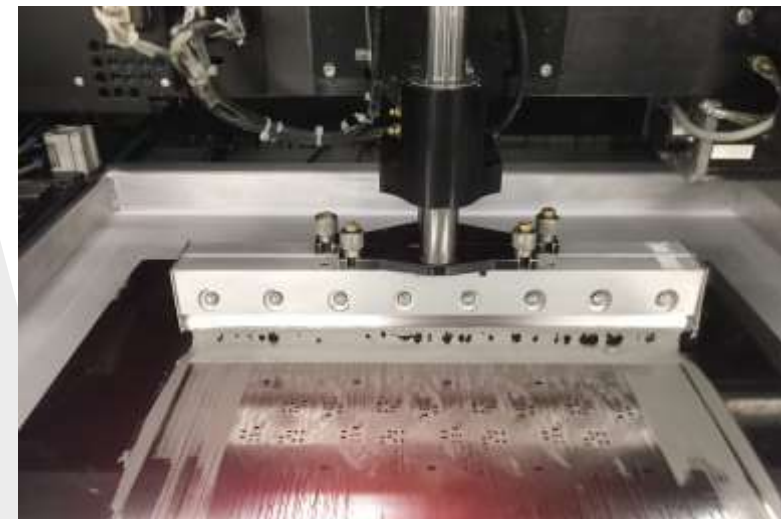
Properties	Value	Methods
Appearance	Colorless limpid	Visual
Density at 20°C	0.77 ± 0.01 g/ml	BRY-MO-028

CHARACTERISTICS

TOPKLEAN™ EL 7 is a light coloured, odourless liquid.

It can be easily recycled, recovered or disposed as used oil by specialized companies.

Properties	Value	Methods
Water solubility	Not soluble	-
Viscosity @ 25°C	1.9 mm ² /s	No standard
Flash point	60 °C	
Distillation interval	187 – 212 °C	No standard
Surface tension @ 20°C	23.5 mN/m	
Relative evaporation speed	0.09 nBuAC	
Dielectric rigidity	200 KV/ cm	



CLEANING IN ELECTRONICS

Stencil cleaning

AQUEOUS PRODUCT

TOPKLEAN EL606

Type: solvent

Process: spray

Used parameters:

- Pure or diluted → EL606 Prep30
- Room temperature
- No rinsing or rinse with water

HSE:

- No flash point

Limits:

- May attack or dissolve the glue around the stencil
- At some temperature, can form 2 phases

SOLVENT PRODUCT

TOPKLEAN EL 10F

Type: hydrocarbon

Process: Manual, spray bottle

Used parameters:

- Pure
- Room temperature
- No rinsing

HSE:

- Flash point = 38°C
- Flammable



TOPKLEAN EL 7

Type: hydrocarbon

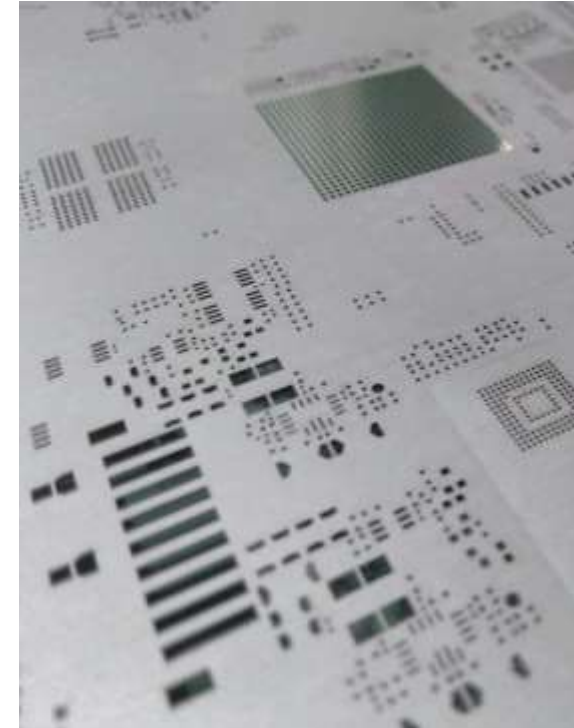
Process: Manual or under stencil cleaning (inside the printer)

Used parameters:

- Pure
- Room temperature
- No rinsing

HSE:

- Flash point = 60°C
- Flammable



CLEANING IN ELECTRONICS

Stencil cleaning – TOPKLEAN EL606

TOPKLEAN EL606

Type of product

Solvent based

Main advantages

- ✓ No foam
- ✓ Compatible with metallic parts
- ✓ Compatible with polymers
- ✓ No flash point
- ✓ **No VOC and no GWP**
- ✓ **No pictogram**

Characteristics

Color:	Colorless
Odour:	Characteristic
Solubility:	Partial in water
Boiling point:	> 100°C
Flash point:	No



Pollutants

Fresh solder paste mainly on stencil and misprint on PCB

Process and machine qualification

- ✓ Batch spray
- ✓ Immersion with immersed jets

Machine qualification:

- ✓ MBTech N29
- ✓ PBT SuperSWASH, MiniSWASSH and CompaCLEAN

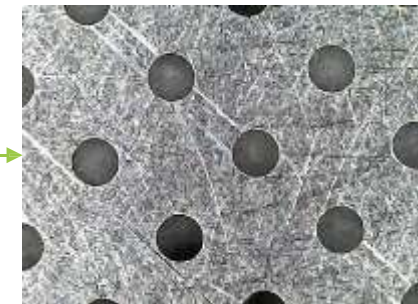
Success stories

Machine:
Concentration:
Parts:
Pollution:

PBT SuperSWASH
30%
Stencil
Inventec Solderel DMH 524
AIM lead free solder paste
Heraeus adhesive

Process:

- Cleaning: 27°C, 10 min
- Rinsing: 26°C, 3min30
- Drying: 90°C, 3min



TOPKLEAN EL 606

CLEAN FRESH PASTE



TYPE OF PRODUCT

Solvent based - Neutral



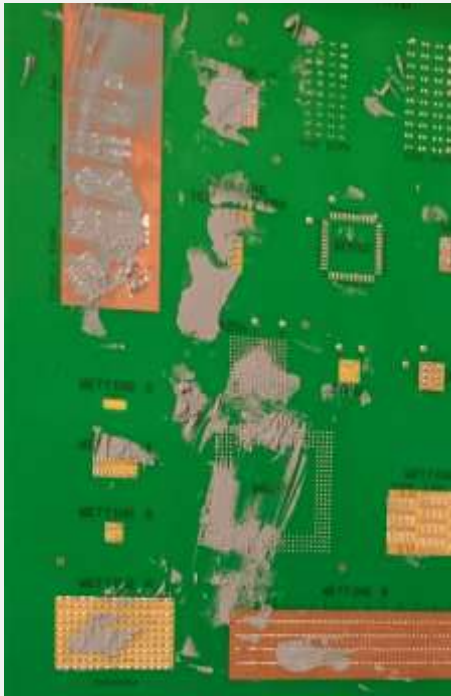
POLLUTANTS

Fresh solder paste mainly on stencil and misprint on PCB



PROCESS PARAMETERS

Spraying machine or immersion with recirculation + US
Recommended concentration 30%
From room temperature to 40°C
Rinsing optional - Drying



CHARACTERISTICS

Aspect: Clear colorless
Density: $0,95 \pm 0,05$ g/ml
Water solubility: partial → Not a problem for spray process , need recirculation for immersion

Machine compatibility: MBtech N29
PBT SuperSWASH, MiniSWASH and CompaCLEAN



1 CLEANING

Concentration: pure or diluted at 30%

Temperature: room temperature, no heating needed

Time:

- Between 5 min and 10 min = about 10 return trips of the spraying nozzle (PBT SuperWash)
- 20s wait → drain of the cleaning product
- Air knife (1 or 2 return trips) → drain of the cleaning product

2 RINSING (optional)

Product: DI water, pure

Temperature: room temperature, no heating needed

Time:

- Between 1 min and 5 min = about 5 return trips of the water spraying nozzle (PBT SuperWash)
- 20s wait → drain of water
- Air knife (1 or 2 return trips) → drain of water

3 DRYING

Hot air knife

Temperature: around 90°C

Time: between 1 min and 5 min = around 8 return trips of hot air knife (PBT SuperWash)



PBT works

SuperSWASH

MiniSWASH

CompaCLEAN



**Cleaning & Printing Machines
For Electronic Assembly**



PBT Works s.r.o.
Lent 2331
756 61 Bohumínská
Czech Republic

INVENTEC
26 avenue du Petit Port
94883 Vincennes Cedex
France

Material Compatibility with PBT Cleaning Machines

Resulting from our compatibility tests as well as from experiences, we declare that following material from production of INVENTEC:

PROMOCLEAN Disper 605 – CONCENTRATE – 50 % solution with DI water
PROMOCLEAN Disper 607 – CONCENTRATE – 25 % solution with DI water
PROMOCLEAN Disper 616 – CONCENTRATE – 25 % solution with DI water
TOPKLEAN EL-406 – pure (100 %)

are compatible with our cleaning machines:

SuperSWASH (from SN: CH158225)
MiniSWASH (from SN: CB178162)
CompaCLEAN (from SN: CC178172)

This declaration is relevant only for material compatibility, process issues must be solved individually according to each process requirements and conditions.

Application at other machines must be considered case by case, always according to the machine serial number.
Application at other PBT machine types must be individually considered with PBT-Works, case by case.

We underline that this results are valid for pure chemistry in DI water solution (when relevant) of concentration range recommended by manufacturer (INVENTEC) – i.e. fresh, not polluted cleaners. Mixture with some flux residues or glues can cause other reactions and give different than stated results.

Vladimír Šitko



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IČ: 252200789

MBTech
N29



your cleaning partner

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☎ : 03 55 63 75 73 80
Fax : 03 55 63 75 82 40
contact@mbtech.fr

CLEANING AGENT FOR MBTECH N29

Here by, MBtech declares that its cleaning systems type N29 are developed to use water-based cleaning liquids without any flashpoint, self-ignition point, pH neutral and not requesting water rinse step such as:

TOPKLEAN EL606 from INVENTEC PERFORMANCE CHEMICAL

It remains under customer responsibility:

- To check with its chemistry supplier the material compatibility with machine components in contact with the chemical (stainless steel, brass, Teflon®, Polypropylene, PVC, FFKM, NBR).
- To monitor the cleaning liquid in order to maintain its process at high efficiency level (especially in regards to filterability of the chemical and filters life time).

At Saint Lys, the 12th of June 2020
Benoit Fillastre
Commercial Director

MBtech S.A.S. au capital de 15 245 € - R.C. B 793 779 279 - Code APE 2820B
N° SIRET 809052761 0001



Cleaning in electronics - Maintenance cleaning

CLEANING IN ELECTRONICS

Maintenance cleaning – Wave frame and oven parts

AQUEOUS PRODUCT

PROMOCLEAN DISPER 610

Type: alkaline (pH = 10,6)

Process: immersion or batch spray

Used parameters:

- Pure or diluted at 25%
- 50°C – 60°C
- No rinsing or rinse with water

HSE:

- No flash point



PROMOCLEAN OVEN 4

Type: alkaline (pH = 10,9)

Process: manual spary bottle

Used parameters:

- Ready to use
- Wait few minutes after spray then scrub

HSE:

- No flash point



CLEANING IN ELECTRONICS

PCB cleaning – PROMOCLEAN DISPER 610

PROMOCLEAN DISPER 610

Type of product

Water based - Alkaline

Pollutants

Burnt flux

Characteristics

Color:	Colorless	Solubility:	Soluble in water
Density	0,99 ± 0,01 g/ml		
pH	10,6		
Boiling point:	> 100°C		
Flash point:	No		

Process and machine qualification

- ✓ Batch spray
- ✓ Immersion with immersed jets or recirculation

Machine qualification:

- ✓ MBTech NC200 and NC200+
- ✓ PBT SuperSWASH, MiniSWASSH and CompaCLEAN

Success stories

Machine:
Concentration:
Pollution:
Process:

Immersion with US
20%
Baked flux on oven condensation system

- Cleaning: 50°C, 30 min
- Rinsing: Room temperature, 5min
- Drying: compressed air, 10min



PBT works

SuperSWASH

MiniSWASH

CompaCLEAN



**Cleaning & Printing Machines
For Electronic Assembly**



PBT Works s.r.o.
Lent 2331
756 61 Bohumínská
Česká republika

INVENTEC
26 avenue du Petit Parc
94883 Vincennes Cedex
France

Material Compatibility with PBT Cleaning Machines

Resulting from our compatibility tests as well as from experiences, we declare that following material from production of INVENTEC:

PROMOCLEAN Disper 605 – CONCENTRATE – 50 % solution with DI water

PROMOCLEAN Disper 607 – CONCENTRATE – 25 % solution with DI water

PROMOCLEAN Disper 610 – CONCENTRATE – 25 % solution with DI water

TOPKLEAN EL-406 – pure (100 %)

are compatible with our cleaning machines:

SuperSWASH (from SN: CH150225)
MiniSWASH (from SN: CB170162)
CompaCLEAN (from SN: CC170172)

This declaration is relevant only for material compatibility, process issues must be solved individually according to each process requirements and conditions.

Application at other machines must be considered case by case, always according to the machine serial number.

Application at other PBT machine types must be individually considered with PBT-Works, case by case.

We underline that this results are valid for pure chemistry in DI water solution (when relevant) of concentration range recommended by manufacturer (INVENTEC) – i.e. fresh, not polluted cleaners. Mixture with some flux residues or glues can cause other reactions and give different than stated results.

Vladimír Šitko



Managing director
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MBTech

MC200

MC200+



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CLEANING AGENT FOR MBTECH MC200 OR MC200+

Here by, MBtech declares that its cleaning systems type MC200 are developed to use water-based cleaning liquids without any flashpoint, self-ignition point and not requesting any DI water rinse step (MC200) or able to be rinsed with DI water (MC200+) such as:

DISPER 610 from INVENTEC PERFORMANCE CHEMICAL

It remains under customer responsibility:

- To check with its chemistry supplier material compatibility with machine components in contact with the chemical (Stainless steel, Brass, Cast Iron, Polypropylene, NBR, PVC, Kynar, ABS).
- To monitor the cleaning liquid in order to maintain its process at high efficiency level (especially in regards to filterability of the chemical and filters life time if required).

At Saint Lys, the 12th of June 2020

Benoit Fillastre

Commercial Director

MBtech S.A.S. au capital de 15 045 € - R.C. B 391 278 188 - Code APE 3820B
N° intracommerciale : FR 6301773139

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 **INVENTEC**
PERFORMANCE CHEMICALS

- **Need of rinsing**
 - Depends on the customer's requirements
 - Better to rinse if used pure
- **Quality of the rinsing tank**
 - 1 or 2 rinsing tank
 - Quality of DI water must be checked regularly (conductivity measurement)
 - Purifying of DI water with resin filter
- **Homogeneity**
 - Depends on the temperature and on the concentration, Topklean EL606 can form 2 phases
 - Topklean EL606 prep must be used drum by drum
- **Compatibility with the glue used on the stencil**
 - Topklean EL606 may be aggressive for the glue used between the frame and the stencil
 - Risk is higher if the cleaning product is heated
- **Bath life**
 - Depends on the customers data (how many stencil to clean, how much solder paste, etc)

PBT works

SuperSWASH

MiniSWASH

CompaCLEAN



**Cleaning & Printing Machines
For Electronic Assembly**



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756 61 Bohumín prof. Kašubského
Czech Republic

INVENTEC
26 avenue du Petit Parc
94882 Vincennes Cedex
France

Material Compatibility with PBT Cleaning Machines

Resulting from our compatibility tests as well as from experiences, we declare that following material from production of INVENTEC:

PROMOCLEAN Disper 605 – CONCENTRATE – 50 % solution with DI water
PROMOCLEAN Disper 607 – CONCENTRATE – 25 % solution with DI water
PROMOCLEAN Disper 616 – CONCENTRATE – 25 % solution with DI water
TOPKLEAN EL406 – pure (100 %)

are compatible with our cleaning machines:

SuperSWASH (from SN: CH158225)
MiniSWASH (from SN: CB178162)
CompaCLEAN (from SN: CC178172)

This declaration is relevant only for material compatibility, process issues must be solved individually according to each process requirements and conditions.

Application at other machines must be considered case by case, always according to the machine serial number.
Application at other PBT machine types must be individually considered with PBT-Works, case by case.

We underline that this results are valid for pure chemistry in DI water solution (when relevant) of concentration range recommended by manufacturer (INVENTEC) – i.e. fresh, not polluted cleaners. Mixture with some flux residues or glues can cause other reactions and give different than stated results.

Vladimír Šitko



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MBTech

N29



your cleaning partner

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☎ : 03 55 63 75 73 80
Fax : 03 55 63 75 82 40
contact@mbtech.fr

CLEANING AGENT FOR MBTECH N29

Here by, MBtech declares that its cleaning systems type N29 are developed to use water-based cleaning liquids without any flashpoint, self-ignition point, pH neutral and not requesting water rinse step such as:

TOPKLEAN EL606 from INVENTEC PERFORMANCE CHEMICAL

It remains under customer responsibility:

- To check with its chemistry supplier the material compatibility with machine components in contact with the chemical (stainless steel, brass, Teflon®, Polypropylene, PVC, FFKM, NBR).
- To monitor the cleaning liquid in order to maintain its process at high efficiency level (especially in regards to filterability of the chemical and filters life time).

At Saint Lys, the 12th of June 2020
Benoit Fillastre
Commercial Director

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N° SIRET 809052761 0001

PROMOCLEAN OVEN 4 – MANUAL CLEANER FOR OVEN PARTS

To clean paste overburnt residues inside oven



TYPE OF PRODUCT

Water based emulsion - Alkaline



POLLUTANTS

Baked flux on oven parts



PROCESS PARAMETERS

Manual - Room temperature
Parts can be hot to improve efficiency
Pure - No rinsing (but wiping)



Manual cleaning of reflow oven: *before*



after

SPECIFICATIONS

Aspect: Colorless to slightly yellow
Density: $0,97 \pm 0,01$ g/ml
pH pure product: $11,3 \pm 0,5$
pH at 1%: $10,1 \pm 0,5$

CARACTERISTICS

Water solubility: total
Surface tension: $29,5 \text{ dyn/cm}$
Not possible to use in bath: chemicals are consumed quickly



Contact with customer

CONTACT WITH CUSTOMER's

The TOP priority questions



What is/are the contaminants ?

- Fresh solder paste, flux residues, oil, grease, dust, particles ...
- Ask for TDS, SDS ...



What is/are the materials involved ?

- Metal (aluminium, steel, copper ...), plastics (PTFE, ABS...), glass, ceramics ...
- Ask for technical data



What are the specifications ?

- Potential (volume), cleaning frequency, environmental spec, price
- Has to follow standards ?



What is the current process ?

- Current process, available machines, possibility to invest ...
- Competitor products (SDS, FDS ...)



What are the quality control methods ?

- Visual, white paper, tests (ionic contamination, SIR, surface tension, particles...)

5 TOP PRIORITY QUESTIONS !

CONTACT WITH CUSTOMER

Product compatibility



Compatible with the pollutants = capable of solubilizing or removing all the pollutants



Compatible with the cleaning machine = chemistry compatible with the machine. Ex:

- Foaming product → not compatible in aspersion (TP not compatible in aspersion but Disper compatible in immersion)
- Oil release → immersion process with de-oiling



Compatible with health and safety requirement = safety pictograms, P&H sentences



Compatible with the environment requirements :

- VOC (Volatile Organic Compounds)
- GWP (Global Warming Potential)
- ODP (Ozone Depletion Layer)



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THANK YOU
FOR YOUR ATTENTION

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