



# CUTTING TOOLS

CLEANING & DECOATING



ECOLOGICAL CLEANING SOLUTIONS

 SWISS QUALITY





## CLEANING AND SURFACE PREPARATION

Quality, reliability and expertise applied to surface preparation prior to PVD/CVD coating.

### COMPATIBILITY

- HSS
- PM HSS (High and low alloyed)
- HSSE
- Tool steel (High and low alloyed)
- Stainless steel
- Cold-work steel
- Nitriding steel
- Tungsten carbide
- Cermet
- Ceramic

### PARTS

- Drill
- Reamers
- Inserts
- Taps
- Dies
- Bevels
- Grinders
- Hobs
- Saws

### POLLUTIONS

- Grinding oils
- Oxidations
- Abrasives

## DETERGENTS, SOLVENT, FINISHING AND SPECIFIC APPLICATIONS

PRODUCT	pH	TYPE	FUNCTION	APPLICATION/CONTAMINATION
VACUKLEEN 440 <sup>1</sup>	13.7	Detergent	Spray or ultrasonic cleaning	Grinding oil, polishing compounds
VACUKLEEN SUPRA II <sup>2</sup>	14		Grinding oil, polishing compounds	
VACUKLEEN 20.01	8.4	Finishing detergent	Ultrasonic cleaning	Etching
RODASTEL 30	0.5			Hydrophobic finish
GALVEX 18.08	9.5			Hydrophobic finish
KORROSTOP 5000	12.3	Rinse additive	Spray or ultrasonic cleaning	Protection against corrosion

<sup>1</sup> Requires an oil separator <sup>2</sup> Can be used in vacuum system

## STRONG ALKALIS

for heavy pollutions

### ▪ VACUKLEEN 440

**Non foaming liquid detergent**, suitable for removing neat and grinding oils in ultrasonic or spray processes (the machine must be equipped with an oil separator), but also abrasives or various organic compounds.

### ▪ VACUKLEEN SUPRA II

**Phosphate free liquid detergent**, suitable for removing neat, grinding oils and abrasives in ultrasonic processes.



## FINISHING

for corrosion protection or etching

### ▪ GALVEX 18.08

Slightly alkaline finish for ultrasonic processes, which leaves a **water-repellent film**. Increases the speed of the drying process and protects against corrosion.

### ▪ KORROSTOP 5000

Rinsing additive in final rinse steps for an **optimal protection against corrosion** of sensitive steels. Suitable for spray cleaners.

### ▪ RODASTEL 30

Multipurpose acid finish: **slight etching and brightening** of metals and carbides to improve adherence of PVD/CVD coatings.

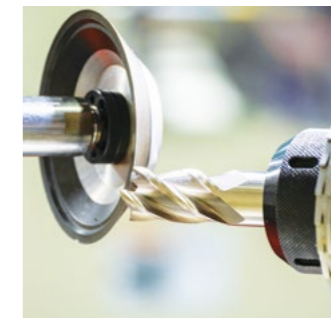


## MILD ALKALIS

for mild pollution and free rinsing

### ▪ VACUKLEEN 20.01

**Universal liquid detergent**, for degreasing on all materials. Gives a high degree of finish with its excellent rinsability.



## SUPPORT

- **NGL Academy:** training on precision cleaning, passivation, water treatment, and HSE regulation
- **Application Centre:** various cleaning systems and wide range of analytical tools for all types of tests
- **Worldwide and local implementation**

## ISO CERTIFICATION\*

- ISO 9001 - Quality
- ISO 14001 - Environment
- ISO 45001 - Health and safety at work

\*Applicable to the production site at NGL Cleaning Technology SA



## EQUIPMENT

With our **UPC 3000**, ensure on a daily basis that your equipment is properly set up:

- Measurement of ultrasonic power in watt/liter
- Measurement of the conductivity
- Temperature measurement
- Detergent concentration measurement
- Measuring the quality of demineralised water (0.001 µS/cm to 200 µS/cm)





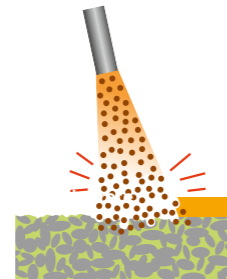
# CUTTING TOOLS RANGE: DECOATING

## DECOATING STEEL TOOLS

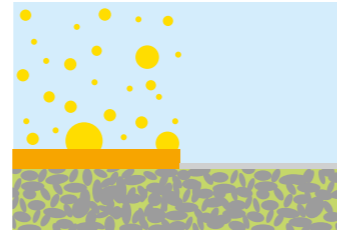
Removal of PVD/CVD coatings while preventing corrosion.

### MATERIALS:

- HSS
- PM HSS (low and high alloyed)
- HSSE
- HSS-Co
- Tool steel (low and high alloyed)
- Stainless steel
- Cold-work steel
- Nitriding steel
- Tempered steel



Sandblasting:  
**Damaged surface**  
Dulled edges



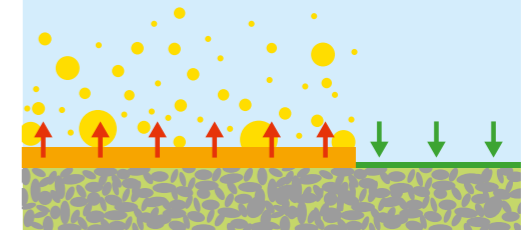
Chemical decoating:  
**No damage**  
to edges and surface

## DECOATING CARBIDE TOOLS

Removal of PVD/CVD coatings while preventing cobalt leaching.

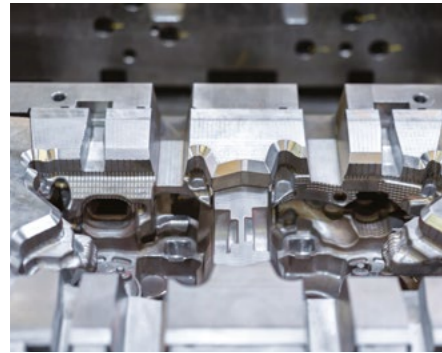
### MATERIALS: CARBIDE + CERAMIC

- Tungsten carbide
- Cermet
- Zirconium oxide ceramic
- Aluminium oxide ceramic
- Soldered carbides tips steel tools
- cBN
- PCD
- MCD
- Al2O3



**Stripping** of coating  
**Cobalt leaching inhibition**

## STEEL DECOATING



### ▪ FERRODEC 56

Powdered product for the decoating of aluminium or titanium based layers on steel tools.

#### Benefits:

- Cost-effective
- Fast decoating
- Efficient decoating on Ti and Al based PVD/CVD coatings

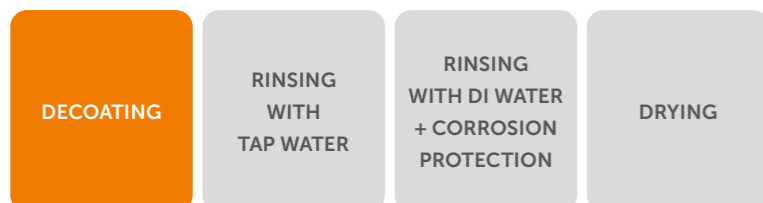
### ▪ EXCARBONITE 222

Powdered alkaline liquid product for the decoating of chromium or silicon based layers on steel tools.

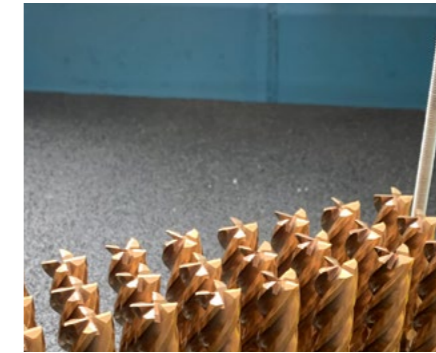
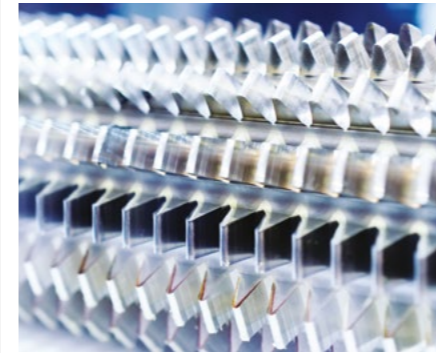
#### Benefits:

- Very efficient on Cr and Si layers
- Suitable for all types of Steel
- Efficient decoating on DLC(Cr) or DLC(Si) layers

## TYPICAL DECOATING PROCESS FOR HSS TOOLS:



## CARBIDE DECOATING



### ▪ UNICERAL 308

Acidic liquid product for the decoating of titanium, aluminium or zirconium PVD layers on carbide tools.

#### Benefits:

- Ready to use
- Optimized protection of carbide substrates
- Shiny effect after stripping process
- No damage to tools edges

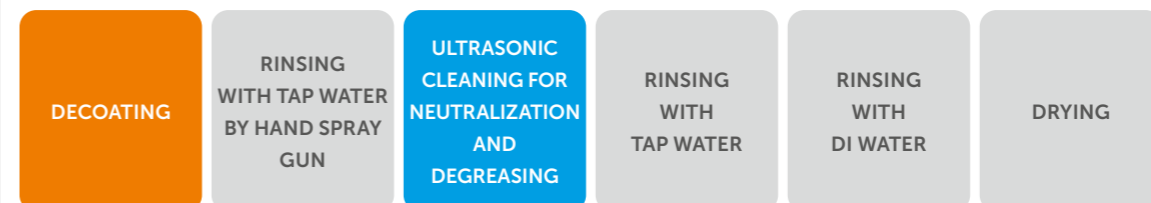
### ▪ CERALTIN 211

Alkaline Liquid product for the decoating of chromium or silicon based layers on carbides.

#### Benefits:

- Optimized protection of Carbide substrates
- No crystallization of the bath and no vapor condensate
- Shiny Effect

## TYPICAL DECOATING PROCESS FOR CARBIDE TOOLS:





## NGL DECOATING MATRIX COATING / SUBSTRATE / COATING THICKNESS / TIME:

SUBSTRATES	COATINGS							
	TiCN	TiN, TiAlN, AlTiN	TiSiN, TiSiAlN	ZrN, ZrCN	AlCrN, AlCrSiN	DLC: Cr, CrN adhesion layer	DLC ta-C/DLC a-C/ DLC a-C:H	CrN
<b>CARBIDE</b>	U308	U308	U308	U308	C211	x	x	x
Time	1-2μ 18-24h / 2-3μ 48-72h / 3-5μ 3-6d	1-2μ 8-24h / 2-3μ 24-48h / 3-5μ 24-72h	1-2μ 8-24h / 2-3μ 24-48h / 3-5μ 24-72h	1-10h	1-2μ 24-72h / 2-3μ 48h-5d / 3-5μ 3-10d	-	-	-
<b>HSS (with cobalt in the alloy)</b>	U308	U308	U308	U308	E222, possible cobalt leaching	E222, possible cobalt leaching	y	E222, possible cobalt leaching
Time	1-2μ 18-24h / 2-3μ 48-72h / 3-5μ 3-6d	1-2μ 8-24h / 2-3μ 24-48h / 3-5μ 24-72h	1-2μ 8-24h / 2-3μ 24-48h / 3-5μ 24-72h	1-10h	45-180 min	45 min-48h	-	20-120 min
<b>HSS</b>	F56	F56	F56	U308	E222	E222	y	E222
Time	3-6h	1-3h	1-3h	1-10h	20-120 min	45 min-48h	-	20-120 min
<b>HSS (without cobalt in the alloy)</b>	F56	F56	F56	U308	E222	E222	y	E222
Time	3-6h	1-3h	1-3h	1-10h	20-120 min	45 min-48h	-	20-120 min
<b>TOOL STEEL</b>	F56	F56	F56	U308	E222	E222	y	E222
Time	3-6h	1-3h	1-3h	1-10h	20-120 min	45 min-48h	-	20-120 min
<b>STAINLESS STEEL</b>	F56	F56	F56	U308	E222	E222	y	E222
Time	3-6h	1-3h	1-3h	1-10h	20-120 min	45 min-48h	-	20-120 min
<b>NICKEL-CHROMIUM-BASED SUBSTRATES</b>	F56	F56	F56	U308	E222	E222	y	E222
Time	3-6h	1-3h	1-3h	1-10h	20-120 min	45 min-48h	-	20-120 min

x - no solution

y - no solution if no Cr/CrN adhesion layer available

The decoating matrix is a schematic abstract. Due to the high substrate/coating diversity the classification for compatibilities can't be generalized and must be confirmed by test before use.

### Decoating bath temperatures:

- U308: Uniceral 308 (80-90°C (176-194°F)) / bath circulation required
- F56: Ferrotec 56 (60-80°C (140-176°F)) / usually 70°C (158°F)
- E222: Excarbonite 222 (40-70°C (104-158°F)) / usually 55°C (131°F) / bath circulation required
- C211: Ceraltin 211 (130-140°C (266-284°F))





# WHY DECOAT PARTS?



# SAFETY

## TOOL RESHARPENING OR REPOLISHING: GIVING THE TOOL MULTIPLE LIFE CYCLES

PVD and CVD coatings allow to increase the hardness of a cutting tools edge, hence increasing both the lifetime and output of the tool. But the coating may wear and the tool will need to be resharpened and repolished.

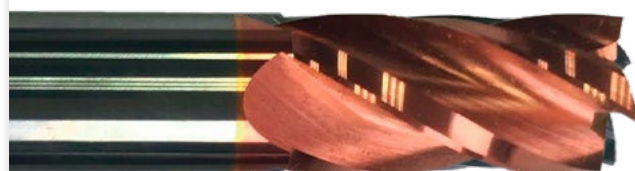
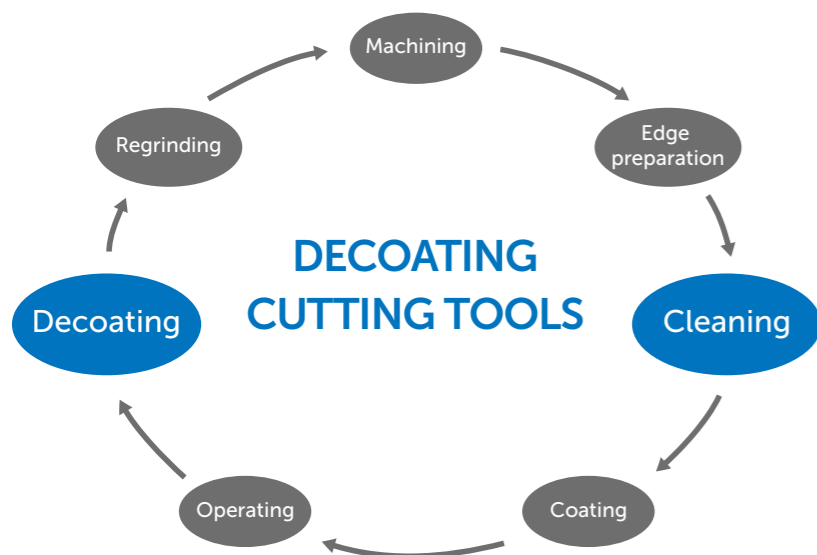


For parts such as hobs or injection molds, where the tolerance on the produced parts is strictly controlled, it is essential that the coating is removed without any damage to the substrate.

## COATING DEFAULT:

PVD coating is very sensitive and many issues can occur in the surface preparation process prior to coating, as well as problems during the coating itself, such as arcs formation or adhesion issues.

An insert or a drill which has coating defects or does not match the necessary coating thickness will be useless and in order to avoid scrapping these costly tools, decoating is the only professional option.



Before Decoating



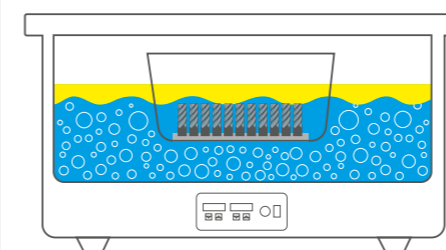
After Decoating

The NGL decoating range allows precise and safe decoating of most coatings on both HSS or carbide tools.

NGL chemicals are designed to mitigate risks to the maximum, by looking for the best compromise between efficiency and safety in the composition of the products.

Unsafe decoating		Safe decoating	
EDTA			Uniceral 308 Non hazardous
Hydrochloric acid			Excarbonite 222
Hydrofluoric acid			Ceraltin 211
Hydrogen Peroxide			Ferrodec 56 Non hazardous
Sodium perborate			
Potassium permanganate			

## UNICERAL 308 AND CERALTIN 211: EXTRA SAFETY



→ Oily top phase reduces hazardous fumes and strong evaporation

## TRAINING

Benefit from our support to qualify your operators:

- Use
- Storage
- Handling
- Disposal



- Smart design
- Smart usage



Improved Safety + Risk management





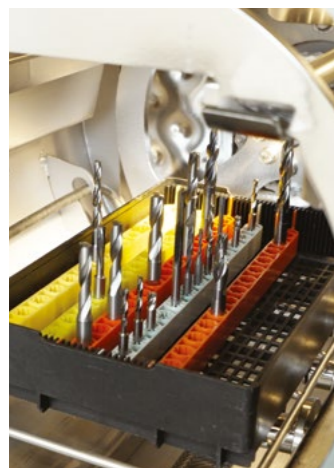
## THE DECOATING CENTRE IN BOCHOLT, GERMANY

Our decoating processes are suited for PVD, CVD and PACVD deposited layers.



NGL develops and provides decoating solutions and services for small drill bits, to large pieces such as molds, parts sizes up to 1.5m in diameter and weighing up to 5t.

Our expertise extends to intricate and long parts, with blind holes and deep cavities.



**PARTS TO BE DECOATED :**

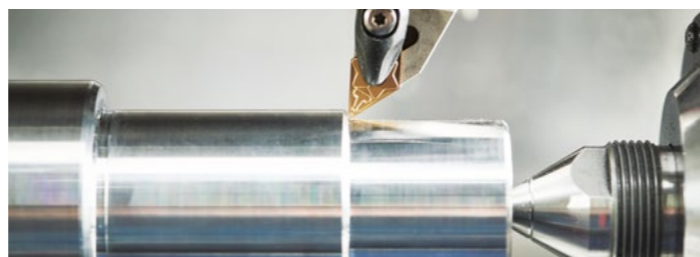
- Cutting tools
- Molds/dies
- PVD chamber parts
- PVD planetary and tube holders
- CVD graphite and CFC parts
- Ceramic components
- Decorative parts
- Special tools
- Recycling materials (carbide scrap)



**TANK CAPACITIES:**

- 3 tanks: 20x30x20 cm
- 3 tanks: 50x60x45 cm
- 3 tanks: 140x25x50 cm
- 3 tanks: 145x145x50 cm
- 3 tanks: 280x80x70 cm
- 6 tanks: 45x60x45 cm
- 6 tanks: 145x70x70 cm

Over 15 different decoating processes in more than 50 different tanks available.



**WEIGHT CAPABILITIES : Up To 5t**

## THE APPLICATION CENTRE, A NETWORK OF EXPERTISE

Ask our experts to help you define the right process from scratch or improve an existing one with our products.

NGL laboratories are open to perform lab tests in industrial cleaning systems with your parts.

### CLEANING EQUIPMENTS:

- A Riebesam spray machine, with over and under nozzles, 4 dosing units, and 0,6 bar pressure jets.
- A Novatec Pluritank ultrasonic line with dual frequencies (25 and 40 kHz), 4 cleaning stages, 4 rinsing stages (Tap and DI water), and a lift-out unit.
- For high purity cleaning and sensitive parts, additional frequencies of 80 and 130 kHz are available.
- A Novatec CRD monochamber machine for partial vacuum ultrasonic cleaning coupled with spray cleaning cycles. Particularly suited for complex geometries.

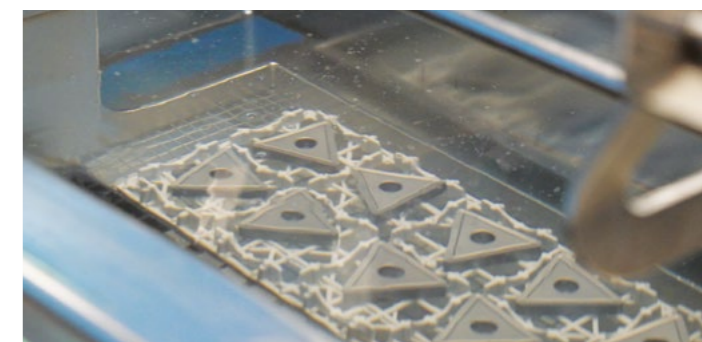
### CLEANING CONTROL EQUIPMENTS:

- Kruss DSA 100 E => surface tension and polarity measurer
- Keyence VHX 5000 => extreme magnification
- MEB JEOL 5600LV x Oxford EDX => surface and pollution characterisation
- Leica systems particles counting
- Binocular microscopes, dyne pens, etc...



**APPLICATION CENTRES IN THE WORLD:**

- Switzerland (Headquarter)
- Denmark
- Germany
- France
- United States
- China
- Singapore





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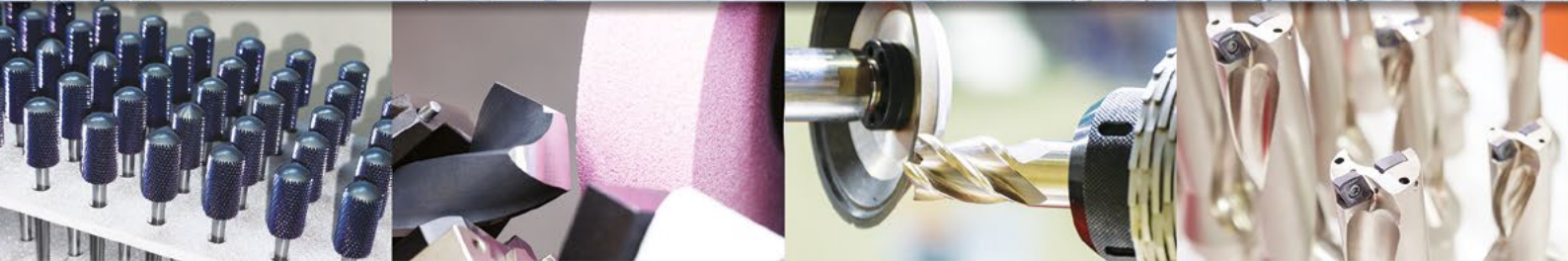
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MADE IN  
GERMANY

