

# THERMOCHEMICAL TREATMENT PLATFORM



Process overview	ICBP (ECM)	NIH (ALD)	ASPN (ALD)
Carburizing	✓		
Carbonitriding	✓		
Austenitic nitriding	✓		
Quenching gas	✓		
Martensitic nitriding		✓	✓
Oxynitriding		✓	
Nitrocarburizing		✓	✓
Pre-oxidation		✓	
Post-oxidation		✓	
Plasma etching			✓

## EQUIPMENTS

### Low pressure carbonitriding furnace (ECM Technologies, ICBP Duo)

- Maximal dimension of charge: 650 mm x 400 mm x 400 mm
- Maximal weight of charge: 300 kg
- Functional temperature:  $1050 \pm 8^\circ\text{C}$  max
- Treatment pressure: 3 to 20 mbar ( $\text{C}_2\text{H}_2$ ) and 3 to 45 mbar ( $\text{N}_2$  and  $\text{NH}_3$ )
- Quenching pressure: 1 to 20 bar ( $\text{N}_2$  and/or  $\text{CO}_2$  and/or He)

### Gaseous nitriding furnace (ALD France, NIH 966)

- Maximal dimension of charge: 900 mm x 600 mm x 600 mm
- Maximal weight of charge: 600 kg
- Functional temperature:  $200 - 700^\circ\text{C} \pm 6^\circ\text{C}$
- Pressure of the enclosure: 400 mbar to atmospheric pressure

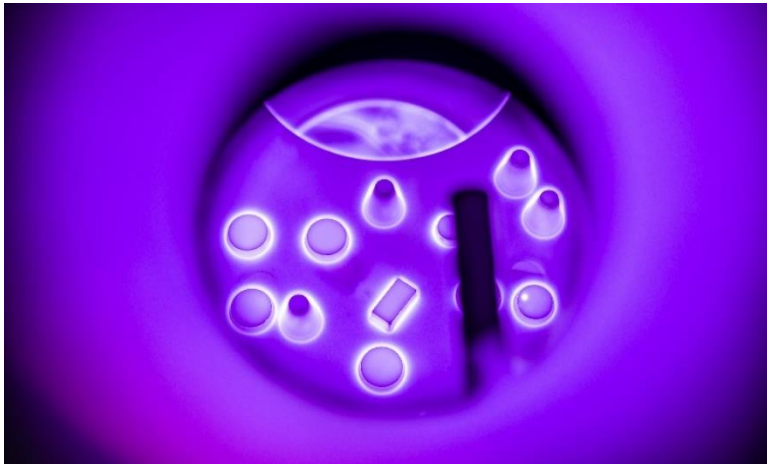
### Ionic nitriding furnace (ALD France, ASPN 8.8)

- Maximal dimension of charge:  $\phi$  800 mm - h 800 mm
- Maximal weight of charge: 300 kg
- Functional temperature:  $600 \pm 8^\circ\text{C}$  max
- Pressure of the enclosure:  $\sim 10^{-2}$  mbar
- Ionic technologies: DCPN or ASPN



## TECHNICAL SERVICES

- **Thermochemical treatment** : creation and/or optimization of treatment, treatment of samples or industrial prototypes
- **Pre-treatment** : Solvent degreasing, sand blasting
- **Post-treatment** : cryogenic enclosure, laboratory furnaces
- **Characterization** : metallurgical (optical microscope, SEM, micro-hardness), chemistry (GDOES, ...)
- **Simulation** : phase diagram via Thermo-Calc



## APPLICATIONS

- Gears
- Bearings
- Cutting tools
- General mechanism

## PLATFORM AVAILABILITY

- Multi-partner research projects with public co-funding
- Research studies/services
- Platform rental with technical support
- Training

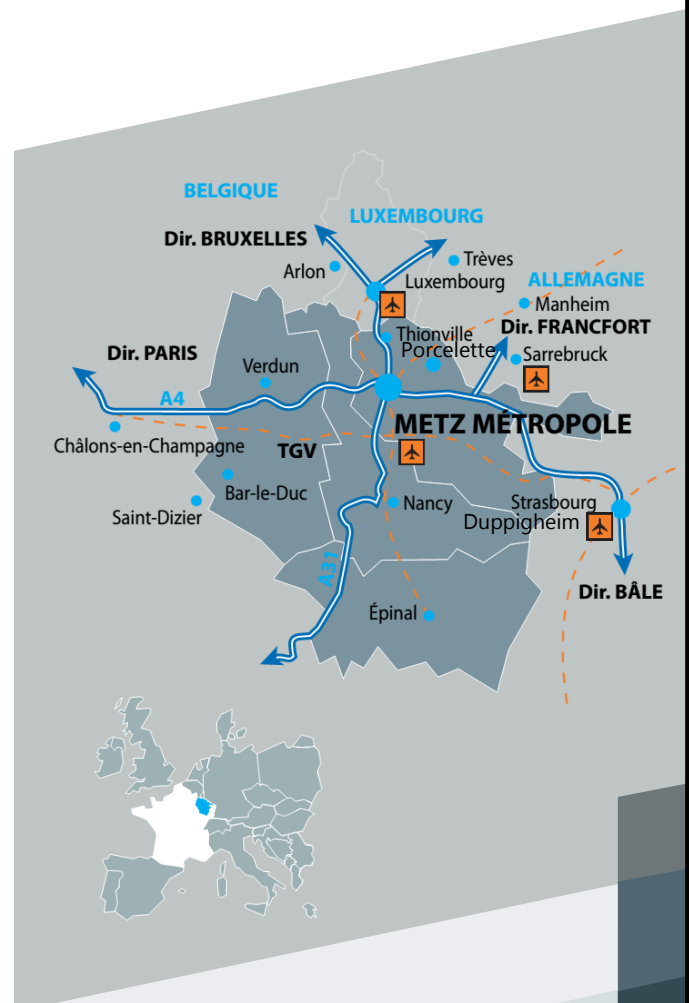
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