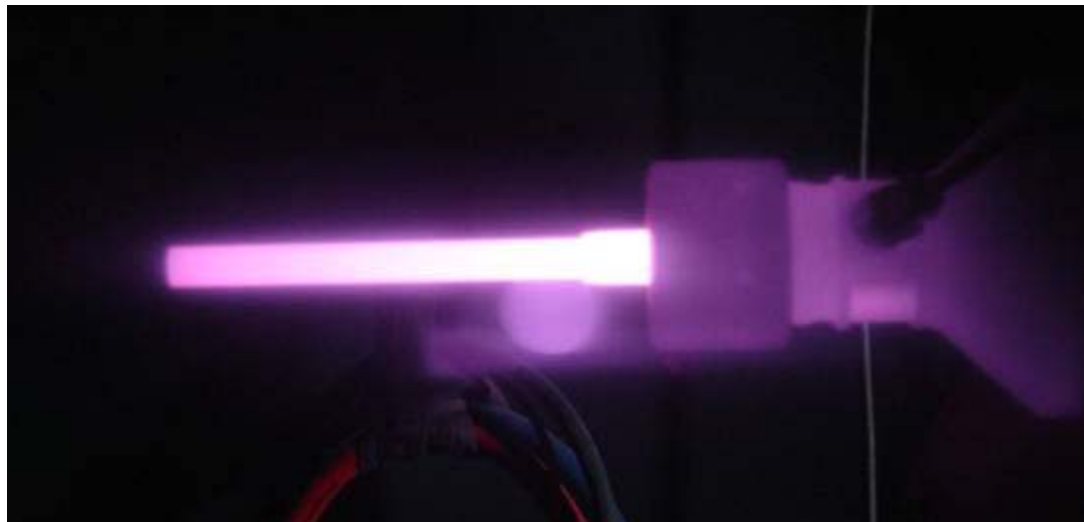


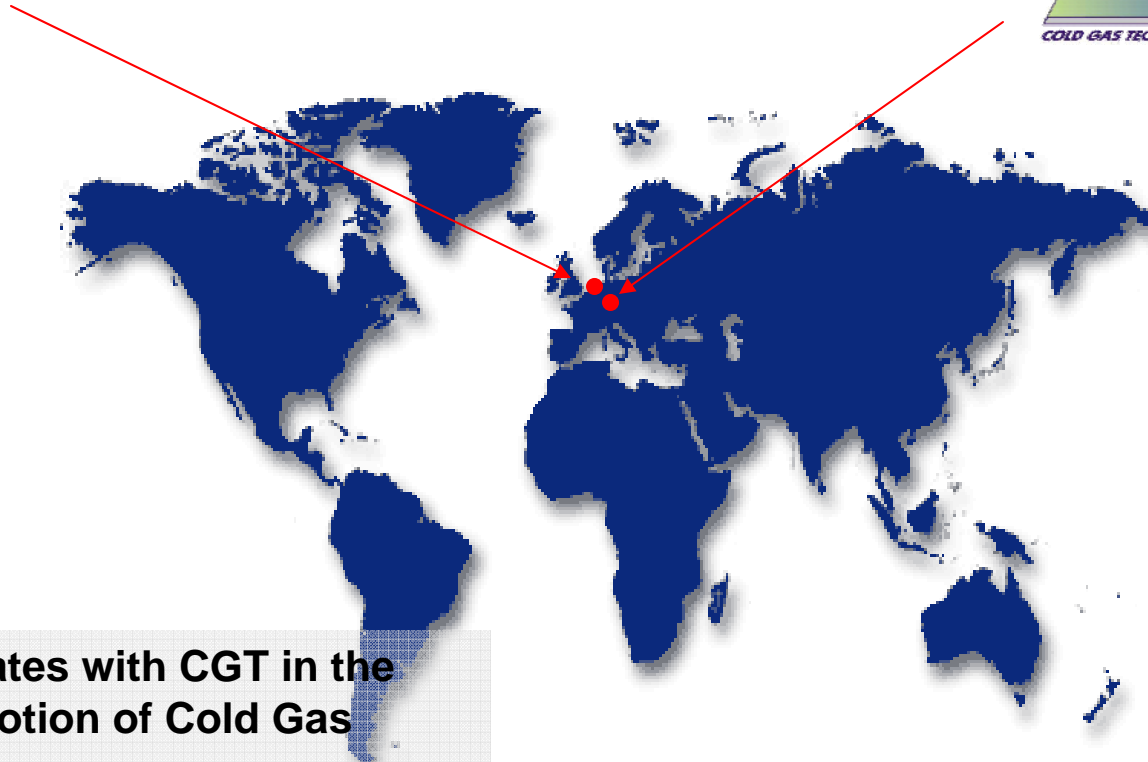
# The new Generation of Cold Spray System **KINETIKS 4000**



# *Cold Gas Spray Systems*



Frost Spray Technologies



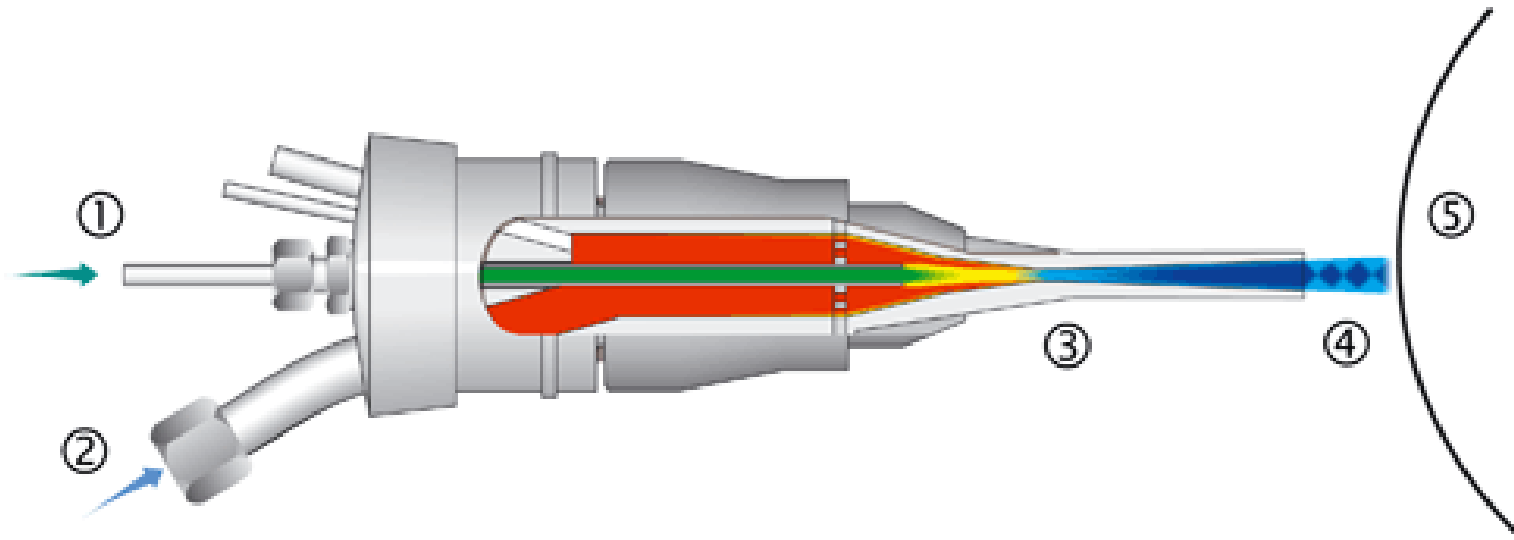
**FST Cooperates with CGT in the  
Global Promotion of Cold Gas  
Technology**

**FST has promotional restrictions  
in: Germany, France Italy, Belgium,  
Spain, USA, Canada, Mexico,  
Taiwan**



Frost Spray Technologies

# Cold Gas Spray Systems

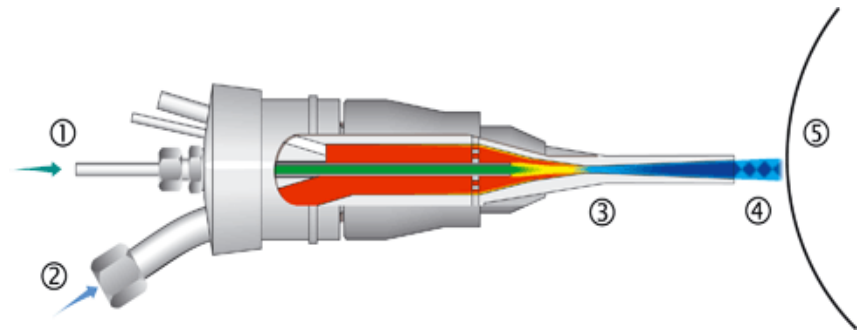


## **Cold Spray**

1. Carrier Gas + Powder
2. Process Gas (Nitrogen, Argon, Helium)
3. Nozzle
4. High Velocity Gas Stream
5. Component

# Cold Gas Spray Systems

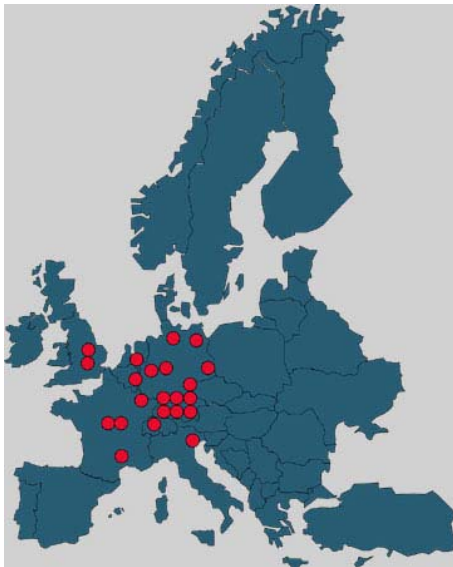
- Cold Gas is a NEW generation High Velocity Thermal Spray Process
- More than with the HVOF process, the kinetic energy is used as the energy carrier
- The Jet can reach temperature of up to 800 °C while the particles will be accelerated  $>1.000\text{m/sec}$
- Spray Rates are 3 to 15 kg/hr. Typical deposit efficiencies  $>80\%$
- Coatings are dense and oxide free
- Typical materials include: Zinc, Copper, Aluminum Nickel alloys, Tantalum, Niobium, etc.
- Applications can be found in; Automotive Industry, Corrosion market, Electronics. New applications in other and new market are found regularly, making Cold Gas the fastest growing technology



# *Cold Gas Spray Systems*

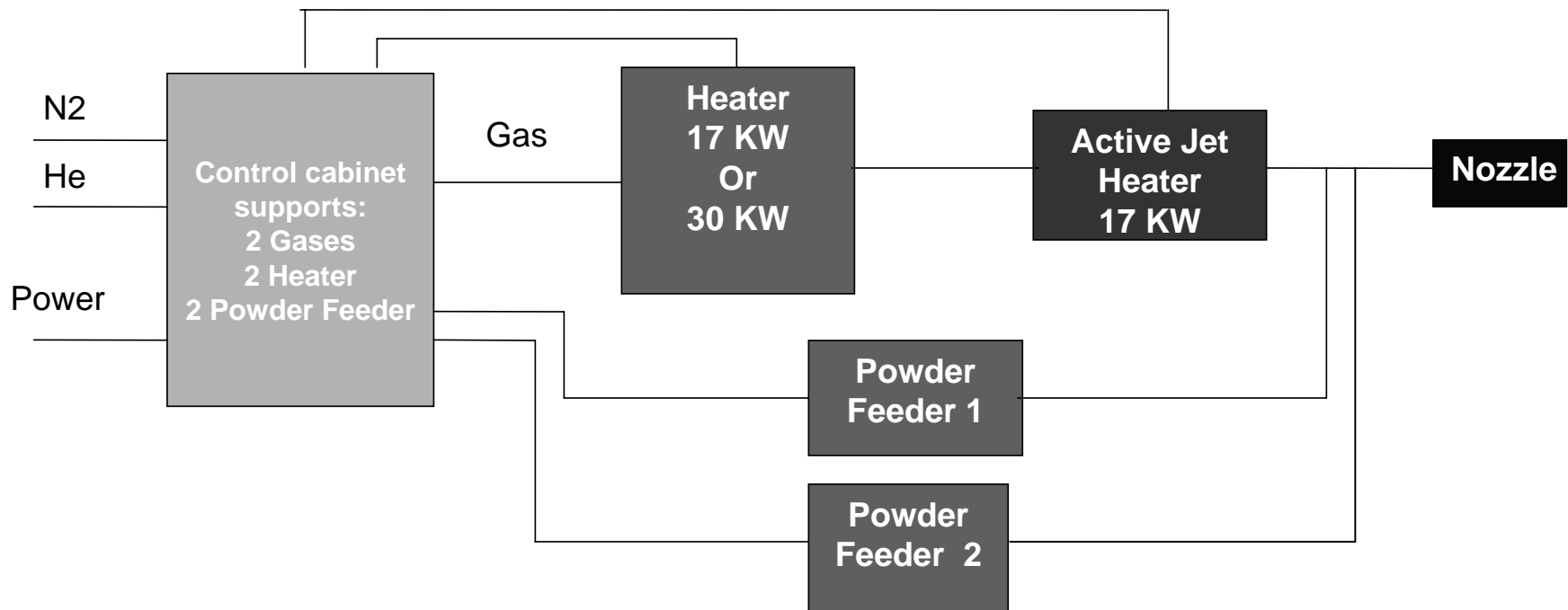
## *References*

Over 40 Systems Sold World-Wide



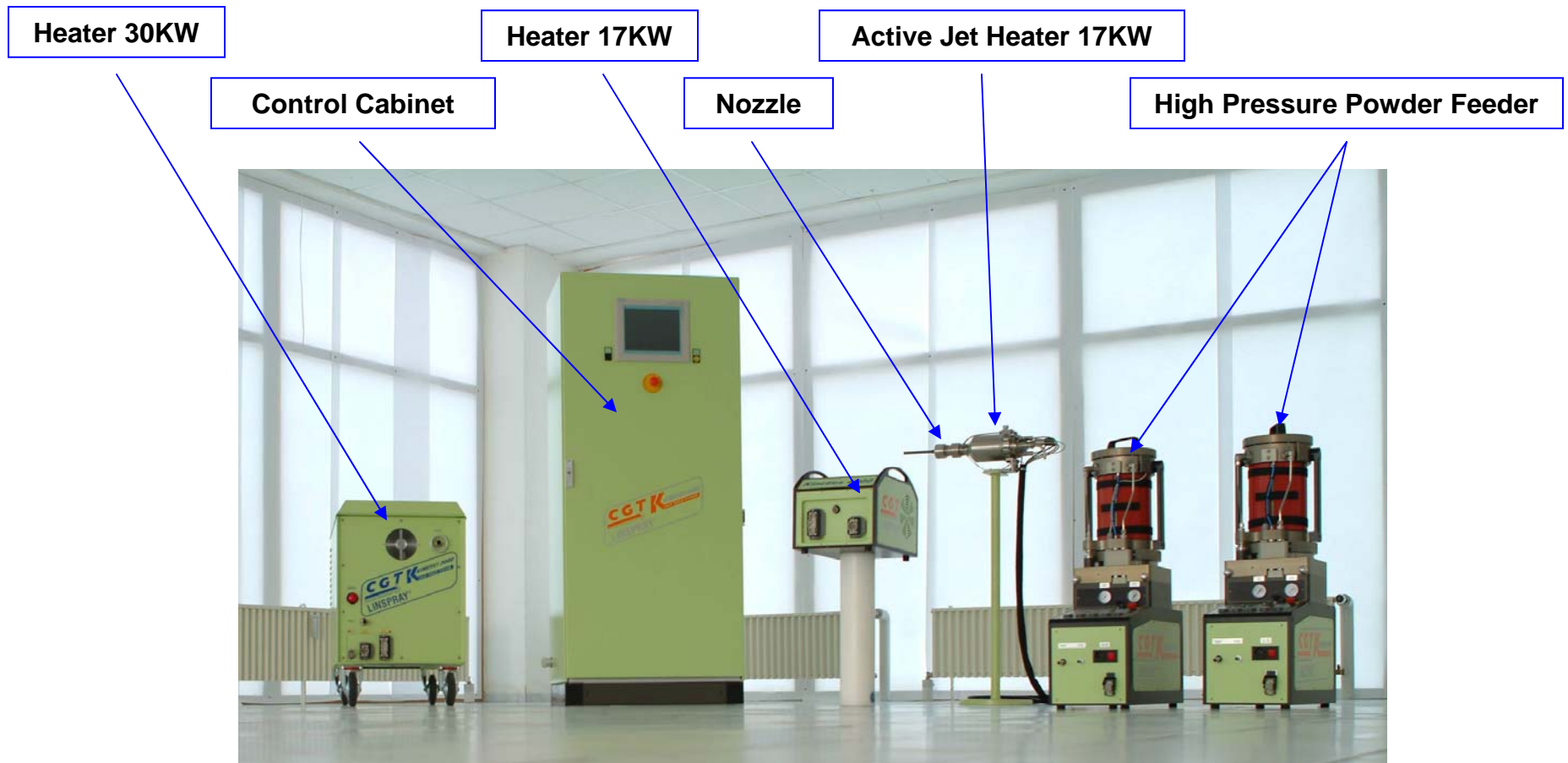
# *Cold Gas Spray Systems*

## **System Overview**



# *Cold Gas Spray Systems*

## **System Overview**



## ***Control Cabinet***

- Touch Screen Operation
- Mass Flow Controlled
- New modular Software Design
- From 17 up to 47 KW heating power
- Control for one or two Powder Feeders
- More than 8 System Configurations





# Cold Gas Spray Systems

## Heaters

Coil heater

200 m<sup>2</sup> Helium -> 450 °C



30 KW

Filament heater

70 m<sup>2</sup> Nitrogen -> 550 °C

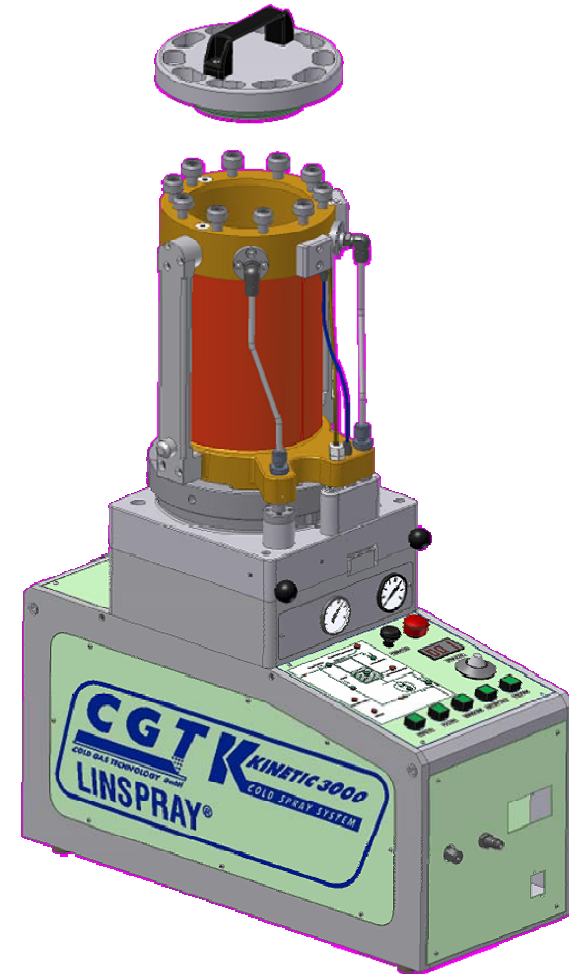


17 KW

## ***Powder Feeder***

PF 4000 Comfort

- TuV certified High Pressure Powder Feeder
- Low Maintenance
- Easy of use; Push, Turn and Pull
- Safety First

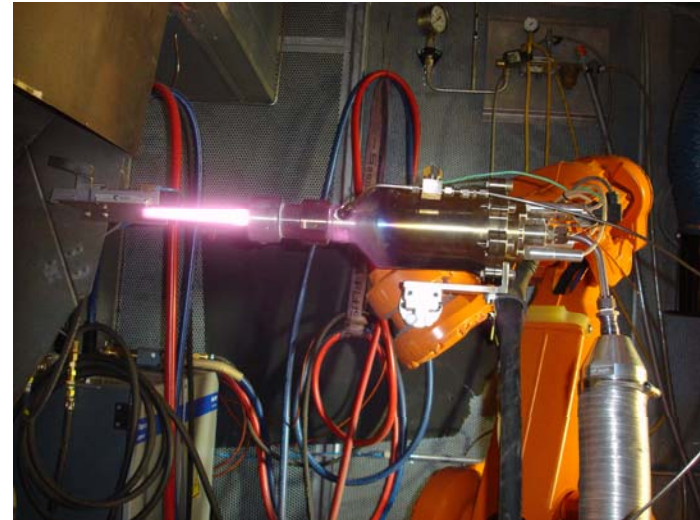


## **Cold Gas Gun**

### Active Jet

Filament heater

70 m<sup>2</sup> Nitrogen -> 600 °C

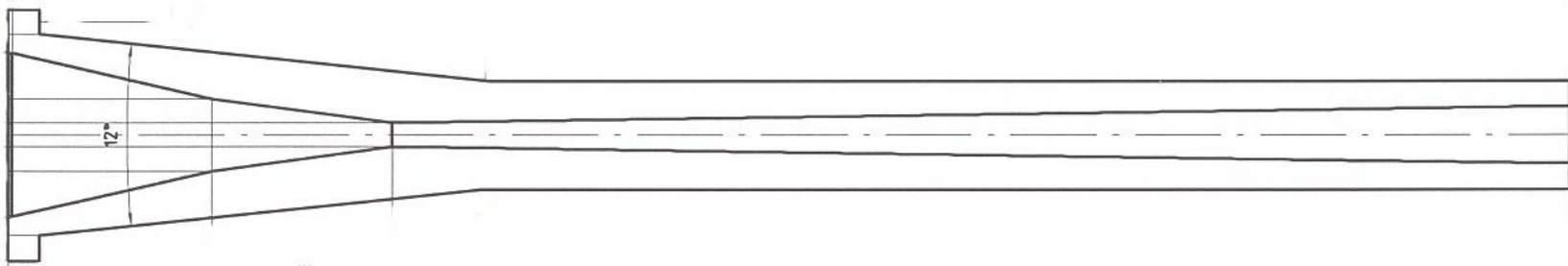


- Max 800°C at 40 bar for nitrogen  
(with preheater HT 300/17)
- Max 800°C at 30 bar for helium  
(with Linspray preheater)

## **Nozzles**



- Nozzle Type 27 TC
- Nozzler Type 24 TC MOC
- Nozzl Type 33
- Under Development  $>800^{\circ}\text{C}$



## ***Kinetics 4000/17***



### **FEATURES**

- 17 KW
- 40 bar
- 550 °C (Nitrogen)
- 350 °C (Helium)

# Cold Gas Spray Systems

## Kinetics 4000/34



### Features

- 34 KW
- 40 bar
- 800 °C (Nitrogen)
- 650°C (Helium)

# *Cold Gas Spray Systems*

## ***Kinetics 4000/47***



### **Features**

47 KW

30 bar

800 °C (Nitrogen)

800 °C (Helium)

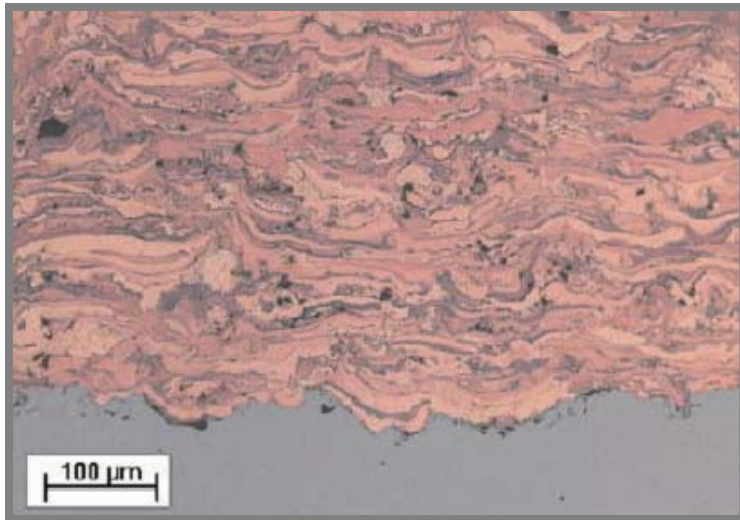
## **Gas Flow Information**



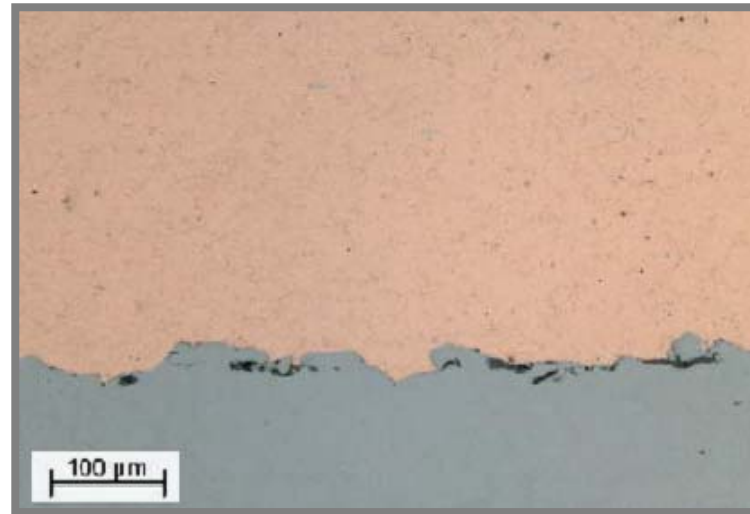
	Nitrogen	Helium
Kinetiks 3000 (previous version)	600 °C 3 MPa	450 °C 3 MPa
Kinetiks 4000/17	550 °C 4,0 MPa	350 °C 4,0 MPa
Kinetiks 4000/34	800 °C 4,0 MPa	650 °C 4,0 MPa
Kinetics 4000/47	800 °C 3,0 MPa	800 °C 3,0 MPa



## ***Coatings***



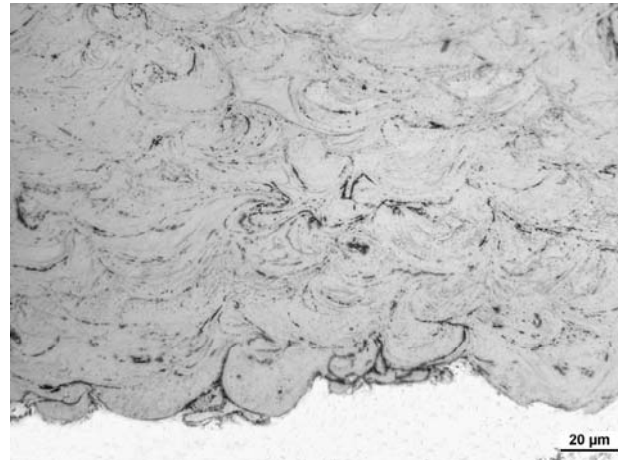
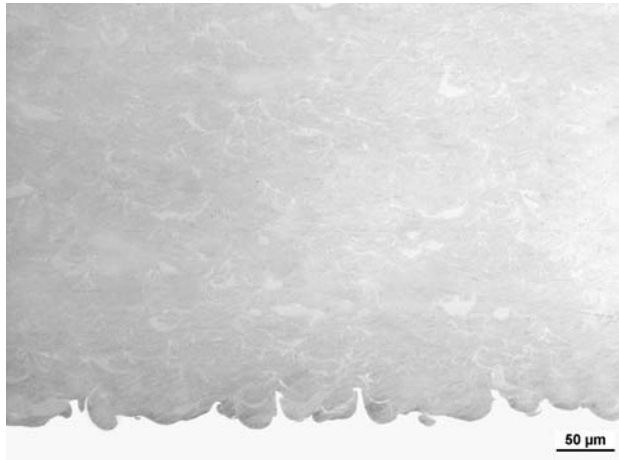
**Arc Sprayed**  
**1,5 wt.-% oxygen**



**Cold Gas Sprayed**  
**< 0,1 wt.-% oxygen**

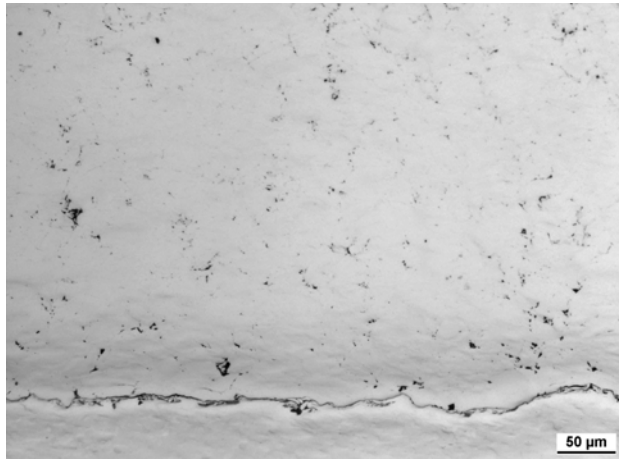
# *Cold Gas Spray Systems*

## **Coatings**



**Ta, 38/10 µm  
deoxidised  
(250 ppm O)**

**AMPERIT® 151  
Ta, special grade**



**Nb, 38/10 µm  
deoxidised  
(600 ppm O)**

**AMPERIT® 161  
Nb, special grade**

# *Cold Gas Spray Systems*

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