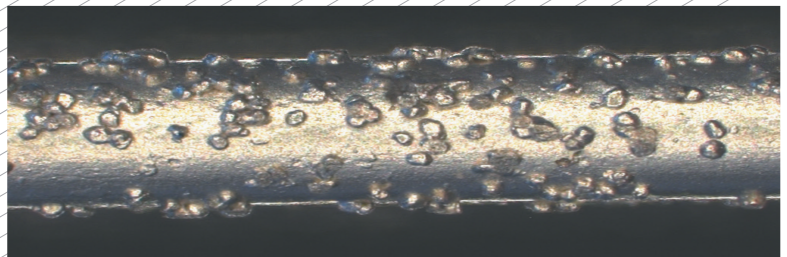




# ThermoCrystal®

By THERMOCOMPACT

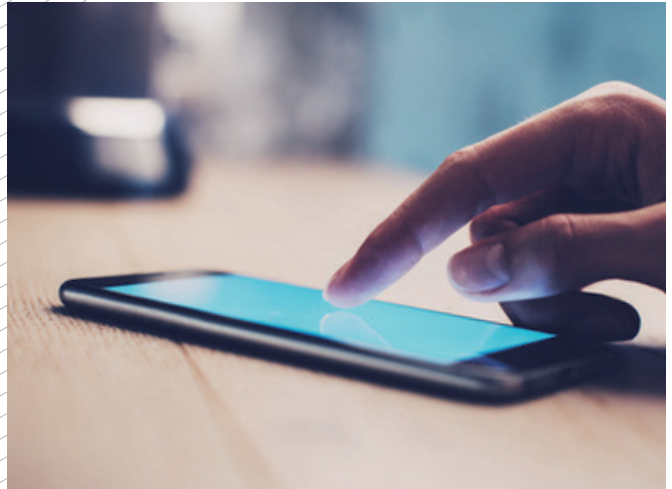
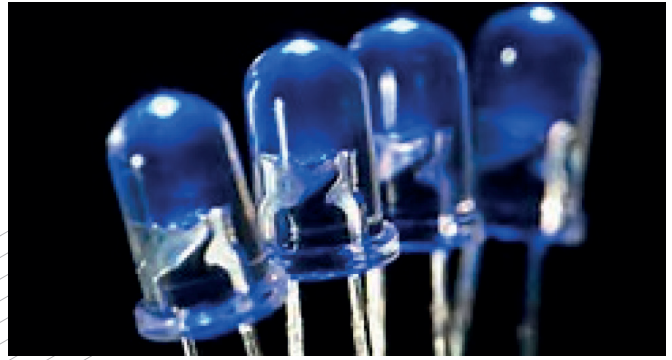
**DIAMOND WIRES**  
**NEW GENERATION**  
**FOR SOFT TO HARD**  
**CRYSTAL SLICING**





Newest fixed abrasive  
highly technical  
engineered wire,  
**Thermocrystal®**  
is the result of :

- A century of technological expertise and innovation in electroplating
- The R&D's team dynamic and proven approach of research and progress



**ThermoCrystal®** is dedicated to slice soft to hardest crystals like sapphire, silicon carbide, quartz, aluminium, nitride, etc.

Our innovative solutions benefit our customers

- In new markets with growth products for smart phones in today's competitive telecommunication market,
- To be competitive in more conventional markets like slicing watch crystals and LED lamps.

 **ThermoCrystal®**  
By THERMOCOMPACT

## THERMOCRYSTAL<sup>®</sup> IS DEDICATED TO SLICING SOFT TO HARDEST CRYSTALS

### Product properties

#### High cutting ability due to its fixed abrasive properties

- › ThermoCrystal<sup>®</sup> reduces :
  - the total thickness variation (TTV),
  - Bow and Warp

#### High stability and results in the machining process

- › ThermoCrystal<sup>®</sup> resistance significantly reduces wire breaks and loss of diamond grains with a tensile strength >3000 MPa

#### High productivity gains by reducing the cutting time

- › ThermoCrystal<sup>®</sup> reduces :
  - the cutting time and the operating costs
  - the energy consumption of the machines and the cooling and cleaning requirements.

#### Economical advantages

- > Easy adjustment to productivity
- > Ensures high efficiency for surface and finish quality requirements
- > Lower cost of ownership

#### Environmentally friendly

- > Increases the waste recycling : less damage on the wire and the parts
- > No slurry management

#### Custom made process according to your needs

- > Your brand of machine
- > The optimal diamond density required
- > The required mechanical tension
- > Proposed length: 5 to 50 km
- > The pitch (standard : 0,6 mm)
- > The tension (standard : 9 N)

## ENGINEERED BY A DEDICATED TEAM

The R&D team of Thermocompact offers a COMPLETE TECHNICAL and LONG TERM SUPPORT FOR YOUR COMPETITIVE NEEDS, including personalized recommendations.

We tailor technologies for your specifications and/or technical requirements.

We develop innovative products and applications like Thermocrytal® for optimal performance, part design, and greater return on investment.



## World patented product

Thermocrytal® is manufactured by Thermocompact. Master of our manufacturing process, we engineer and work on world class state-of-the-art production and equipment certified in Europe :



### Secured world patents for :

- Manufacturing and process
- Fixed abrasive wire
- Loops

## THERMOCRISTAL® IS DEDICATED TO HARD CRYSTAL SLICING :

| APPLICATION FIELDS |                        | WIRE DIAMETER (mm) | DIAMOND GRAIN SIZE |      | WIRE BREAK STRENGTH (N) | DIAMOND DENSITY |
|--------------------|------------------------|--------------------|--------------------|------|-------------------------|-----------------|
|                    |                        |                    | µm                 | Mesh |                         |                 |
| WAFERING           | Sapphire Thermocrytal® | 0,160              | 20-30              | 800  | 77                      | 50              |
|                    |                        | 0,180              | 30-40              | 600  | 84                      |                 |
|                    |                        | 0,200              |                    |      | 100                     |                 |

# EXAMPLE WITH THERMOCRYSTAL® WIRE CORE 180µm

| APPLICATION       |                     | SAPPHIRE SLICING |                                     |         |      |         |       |      |
|-------------------|---------------------|------------------|-------------------------------------|---------|------|---------|-------|------|
| Cutting material  | SPECIFIC CONDITIONS |                  |                                     | RESULTS |      |         |       |      |
|                   | Cut time (min)      | Table speed µ/s  | Slicing capacity cm <sup>2</sup> /m | Ra u    | Rz u | TTV 5pt | BOW   | WARP |
| Ingot 2" diameter | 90                  | 10               | 10-12                               | < 1     | < 3  | < 10µ   | < 15µ | < 15 |
| Ingot 4" diameter | 420                 | 4                | 10-12                               | < 1     | < 5  | < 10µ   | < 15µ | < 15 |
| Ingot 6" diameter | 960                 | 3                | 8-10                                | < 1     | < 5  | < 10µ   | < 15µ | < 15 |

**GENERAL CONDITIONS**

Wire diameter : 0,25 mm

Machine : DWT6800

Speed : 10m/s

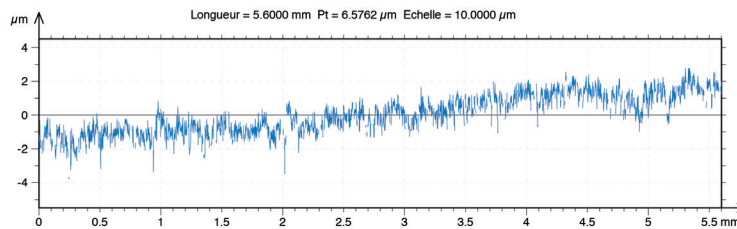
Pitch : 1000 µm

Wire tension : 35N

Wafer thickness : 750µm

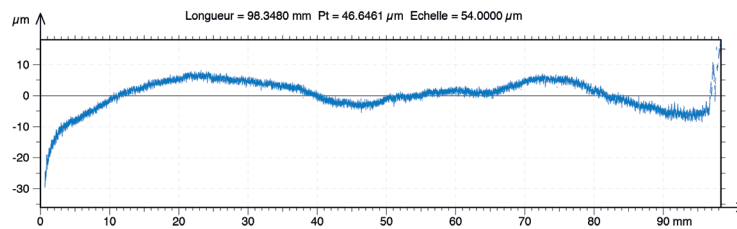
Technical advantages : proven results on roughness, flatness and process performance

Surface roughness is excellent



| ISO 4287                                    | Std dev | Min  | Max  |
|---|---------|------|------|
| Paramètres d'amplitude - profil de rugosité |         |      |      |
| Ra µm (filtre gaussien 0,8 mm)              | 0,39    | 0,01 | 0,37 |
|   |         |      | 0,42 |

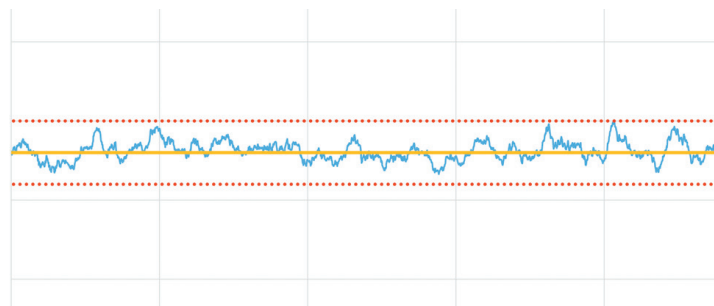
Flatness : good results



Length = 98,3 mm  
Pt = 46,6 mm  
Scale = 54,0 µm  
Pitch = 1,0 µm  
PNM rate = 20,5 %

Manufacturing process : reliable strength

Continuous control of the parameters







## DIAMOND WIRE NEW GENERATION

Thermocrystal® is a brand of Thermocompact.

Thermocompact is part of the **THERMO** Technologies group that includes FSP-One (France and USA) and HWA (Vietnam).

To achieve technological advances and improve productivity of our customers, we apply our founding values since 1913 : **Expertise – Excellence - Innovation.**

## THERMOCRYSTAL® WHEREVER YOU ARE IN THE WORLD



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