

# THERM () technologies

**EDM WIRES** 

# EXCELLENCE IN WIRES



CHOOSE YOUR WIRE

About precision and threading





# 10-50 | WIRES ACCORDING TO YOUR PRODUCTION NEEDS:

### 10 VERY HIGH SPEED & PRECISION

THERMO XCC®
THERMO TEX®
THERMO SWX®

#### 18 HIGH SPEED & PRECISION

THERMO SE®

THERMO SWO®
THERMO SWW®
THERMO O®

SPEED & PRECISION

THERMO SD2<sup>®</sup>
THERMO JP2<sup>®</sup>
THERMO JP2<sup>®</sup>
THERMO JP<sup>+</sup>®

THERMO SO®

SUPER PRECISION
SPEED

THERMO SA®
THERMO SWA®
THERMO SWS®
THERMO A®

54 ALL PURPOSE

THERMO BRASS 1000°
TURBOBRASS°
THERMO BRASS 900°
THERMO BRASS 500°
THERMO BRASS 400°
THERMO FIRST 900/500°

ZINC FREE

THERMO ZF<sup>®</sup>
THERMO ZF<sup>†®</sup>
THERMO ZF sigma<sup>®</sup>

70 PLAN YOUR PRODUCTION





Innovative coatings and wires for high tech industry

**Locations on 3 continents :** Europe, Asia and America.



We seek excellence to be world leader in our niche markets and offer the best:



to meet the expectations of our industrial customers with applications in high technology sectors: aeronautics, space, telecom, automotive, connector technology, general and fine mechanics, health, optical, photovoltaics...

#### PROFICIENT IN 6 ORIGINAL **CORE BUSINESSES**

WE MANUFACTURE:

- High-end wires for **EDM**,
- High value added technical surface coating: electrolytic, thermal and chemical processes,
- **Speciality coated wires** for specific electrical cables,
- Metal heat chemical treatments.
- **Diamond electroplated wires** for photovoltaic, electronic and sapphire applications,
- **Diamond wire saws** for slicing hard and brittle materials.

#### **ECO FRIENDLY SOLUTIONS** TO PROTECT OUR PLANET RESOURCES

- **>** We prefer short circuits for the supplies of raw materials.
- We are committed to zero pollution. All our technological processes continuously improve the waste recycling and eliminate any chemical pollution.
- **)** Our innovative solutions allow energy savings on manufacturing equipment.

#### INNOVATION:

#### PART OF OUR DNA

Forward-looking, with a dynamic and proven approach of continuous progress and innovation, our Research and **Development** team pushes the limit of performance of the process and products and works continuously on new material structures: R&D's group regularly demonstrates results including world wide patents that cover innovative EDM wires and manufacturing processes.

As an international leader and to answer to the needs of our industrial partner and clients in the course of excellence and innovation, we develop every year innovative products and processes in terms of performance, productivity and quality constancy.

More than 18 patents for product and process

2% revenues invested every year in R&D

Major partnerships with research centers, innovation clusters and global corporations

### SMART SPOOL®





traceability

CAPTURE RECORD **DELIVER** INFORMATION

stock management

( humidity control

temperature

( **#** ) shocks

**TRACEABILITY** Its ingenious on-board

WORLDWIDE

electronic system with tracking sensors gives all informations to support:

- Traceability
- Technical data control
- > Production management



An innovation protected by the patent EP 3 356 076

weight & length

EDM WIRES

### EDM WIRES: KNOW HOW AND EXPERTISE FOR MANY YEARS





THERMOCOMPACT, with more than 100 years of experience and know-how acquired in electroplating, designs and manufactures in France the best performing and innovative EDM wires for its clients in high technology sectors.

Today THERMOCOMPACT engineers and works on world class production lines and is considered the world-wide leader in EDM wires, specialised in electroplating.



Hi-Tech WIRES ASIA, since 2007, manufactures in Vietnam the best performing and innovative EDM wires, based on the know-how and the expertise of Thermotechnologies group in electroplating. HWA supplies the Asian and the American markets with the best quality and reliability existing for EDM wires.



Both THERMOCOMPACT and HWA, support their industrial customers to reach their goals of technical and improved productivity, applying the thermo-technology group founding values:



# THERMOCOMPACT: THE ORIGINAL PATENT HOLDER FOR "GAMMA", "GAMMA WITHOUT DISTRIBUTION", AND "BETA/GAMMA" EDM WIRES

We have developed:



The first coated EDM wire in 1973: **THERMO X**®

The fastest EDM wires in 2002: THERMO XCC®

The market reference for precision in 2007: **THERMO SA®** 

A new EDM wire with combination between speed and accuracy: **THERMO SD2**® and **JP2**® in 2012

The next generation of EDM wire in 2019: **THERMO SA**<sup>+®</sup> and **THERMO JP**<sup>+®</sup>

# WE SUPPORT OUR CUSTOMERS IN ACHIEVING EXCELLENCE SINCE A LONG TIME WITH HIGH VALUE EDM WIRES RESULTING IN MAJOR PRODUCTIVITY GAINS

We partner with our clients, the mechanical and micro-mechanical manufacturers to offer high added value wires adapted for precision and productive machining.

- **)** Our **wide range of EDM wires** offers more than 25 EDM wires, from brass to last generation of patented coated wires.
- Our high-tech wires can machine any type of metal part regardless of hardness, complexity and precision.

We continuously adapt our EDM wires to the combined needs of performance of our customers for many applications: cutting tools, molds and dies, highly sophisticated parts manufactured for medical equipment, aerospace, watchmaking, connectors, precision mechanical parts etc...

### WE OFFER PERSONALISED SERVICE AND LONG TERM TECHNICAL PARTNERSHIP INCLUDING:

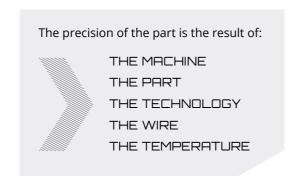
- **Personalised recommendations** on machine issues, wherever our customers are in the world
- **A long-term support**, establishing a **knowledge-sharing plan** with our customers to ensure continuous improvement for EDM wire performances, and greater return on investment.

### CHOOSE

YOUR WIRE

#### **ABOUT PRECISION**

Our coated wire combined with a dedicated technology setup on machine will provide you the best precision:



#### **MACHINES SOLUTIONS**

|                   |                         |   | +GF+                       | 1                  |              |             |            |             |            |         |               |
|-------------------|-------------------------|---|----------------------------|--------------------|--------------|-------------|------------|-------------|------------|---------|---------------|
| YOUR NEED         | WIRE                    | MICRO<br>MACHINING<br>& TOP END<br>ACCURACY | HIGH<br>SPEED<br>MACHINING | GENERAL<br>PURPOSE | <b>∆</b> ⊚%7 | Sodick      | FANUC      | MITSUBISHI  | MAKINO     | VOLLMER | <b>S</b> eibu |
| VERY              | THERMO XCC®             |   |                            |                    |              |             |            |             |            |         |               |
| HIGH<br>SPEED &   | THERMO TEX®             |   |                            |                    | _            |             |            |             |            |         |               |
| PRECISION         | THERMO SWX®             |   |                            |                    | _            |             |            |             |            |         |               |
|                   | THERMO SE® *            |   |                            |                    | -            | •           | •          |             | •          |         |               |
| HIGH<br>SPEED &   | THERMO SWO®             |   |                            |                    |              |             |            |             |            |         |               |
| PRECISION         | THERMO SWW®             |   |                            | Offere             | ed for cert  | ified proce | esses whic | h are still | in operati | on      |               |
|                   | THERMO D®               |   |                            |                    |              |             |            |             |            |         |               |
|                   | THERMO SD®              |   |                            |                    |              |             |            |             |            | -       |               |
|                   | THERMO SD2®             |   |                            |                    |              |             |            |             |            |         |               |
| SPEED & PRECISION | THERMO JP® **           |   |                            |                    |              | _           |            |             |            |         |               |
|                   | THERMO JP2® **          |   |                            |                    |              | _           |            |             |            |         |               |
|                   | THERMO JP*® **          |   |                            |                    | _            |             |            |             |            |         |               |
|                   |                         |   |                            |                    |              |             |            |             |            |         |               |
|                   | THERMO SA®              |   |                            |                    |              |             |            |             |            |         |               |
| SUPER             | THERMO SA 500®          |   |                            |                    |              |             |            |             |            |         |               |
| PRECISION         | THERMO SA 400®          |   |                            |                    |              |             |            |             |            |         |               |
| & SPEED           | THERMO SWA®             |   |                            |                    |              | _           |            |             |            |         |               |
|                   | THERMO SWS®             |   |                            |                    |              |             |            |             |            |         |               |
|                   | THERMO A®               |   |                            |                    |              |             |            |             |            |         |               |
| ALL<br>PURPOSE    | THERMO BRASS<br>1000®   |   |                            |                    |              | -           | -          | •           | -          |         |               |
|                   | THERMO ZF®              |   |                            |                    | _            |             |            |             |            |         |               |
| ZINC<br>FREE      | THERMO ZF <sup>+®</sup> | •   |                            |                    | -            | •           | •          | •           | •          | •       |               |
|                   | THERMO ZFsigma®         | •   |                            |                    | _            | •           | •          | -           | •          |         |               |

#### **ABOUT THREADING**

Most modern EDM machines use a thermal system to prepare the wire before automatic threading. They make the wire straight themselves. This operation on the machine allows the wire to be straight enough for

threading. Thus, they can automatically thread curved wires such as soft brass (500N/mm² and 400N/mm²). Some machines still require the wire to be straight, or to be flexible enough to remain in the threading jet.

| YOUR NEED         | WIRE                              | LEVEL OF STRAIGHTNESS | PAGE |
|-------------------|-----------------------------------|-----------------------|------|
| VERY              | THERMO XCC®                       | С                     | 14   |
| HIGH<br>SPEED &   | THERMO TEX®                       | С                     | 16   |
| PRECISION         | THERMO SWX®                       | С                     | 18   |
|                   | THERMO SE® *                      | В                     | 22   |
| HIGH<br>SPEED &   | THERMO SWO®                       | В                     | 24   |
| PRECISION         | THERMO SWW®                       | С                     | 26   |
|                   | THERMO D®                         | В                     | 28   |
|                   | THERMO SO®                        | Α                     | 30   |
|                   | THERMO SD2®                       | В                     | 32   |
| SPEED & PRECISION | THERMO JP® **                     | А                     | 34   |
|                   | THERMO JP2® **                    | В                     | 36   |
|                   | THERMO JP*® **                    | A                     | 38   |
|                   |                                   |                       |      |
|                   | THERMO SA®                        | A                     | 44   |
| SUPER             | THERMO SA 500®                    | В                     | 46   |
| PRECISION         | THERMO SA 400®                    | С                     | 46   |
| & SPEED           | THERMO SWA®                       | A                     | 48   |
|                   | THERMO SWS®                       | В                     | 50   |
|                   | THERMO A®                         | Α                     | 52   |
| ALL<br>PURPOSE    | THERMO BRASS<br>1000 <sup>®</sup> | Α                     | 56   |
|                   | THERMO ZF®                        | С                     | 64   |
| ZINC<br>FREE      | THERMO ZF <sup>+®</sup>           | В                     | 66   |
|                   | THERMO ZFsigma®                   | В                     | 68   |

- A the wire is straight
- the wire is less straight, but it is flexible enough to thread automatically on most systems, provided the water jet is strong enough
- the wire should be thermally straightened by the machine or be threaded by hand

- \* THERMO SE <sup>®</sup> is an high speed wire. To obtain its best performance, some parameters can be pushed.
- \*\* We have designed THERMO JP<sup>®</sup>,
  THERMO JP2<sup>®</sup> and THERMO JP2<sup>+®</sup>
  to fit with Japanese machines with its
  original brass parameters.

### MAKE AN EASY CHOICE VISUALLY



In the following pages, the radar graph shows the performances of our wires compared to the standard brass.

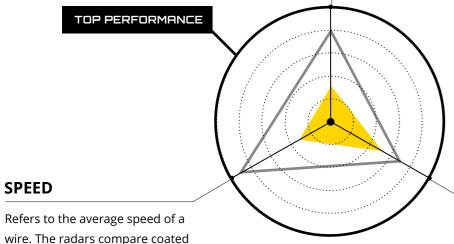
#### CHOOSE YOUR WIRE WITH 3 CRITERIA

#### O.E.E.

#### **Overall Equipment Effectiveness**

Refers to the process performance improvement, compared to the time needed for the wirerelated maintenance of the machine. If, for example, the set up time is reduced, the O.E.E. will increase more product for less ressource. The maintenance related to the wire includes:

- Replacement current feeders
- Wire guides cleaning, and re-alignment of heads



**SPEED** 

wire. The radars compare coated wires to brass, in the same flushing conditions.

Coating enhances not only the rough cut's speed but also the cutting speed of some trims.

#### **QUALITY**

Refers to the best surface finish a wire can achieve, and to the best positioning accuracy during electrical edge sensing.

#### **USAGE RECOMMENDED**



**AERONAUTICS** 



**GENERAL MECHANIC** 



**FINE MECHANIC** 



**MEDICAL** 



**MOLDS** 



**DIES AND TOOLS** 





#### **WIRES DEDICATED**

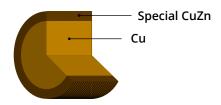
THERMO XCC®

THERMO TEX®

THERMO SWX®

### 

#### COPPER CORE, **CUZN COATING**



THERMO XCC® has been developed and adjusted for GFMS AgieCharmilles machines to increase the cutting speed.

With a machine equipped with Clean Cut generator, THERMO XCC® can reach a cutting speed superior to 500 mm<sup>2</sup>/min.

It offers a processing speed up to 50% higher than standard brass wire.

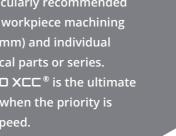
THERMO XCC® wire suits particularly for nickel base alloys, for aeronautic production as an example.

It is particularly recommended for large workpiece machining (H> 150 mm) and individual mechanical parts or series. THERMO XCC® is the ultimate solution when the priority is cutting speed.

#### **USAGE RECOMMENDED**





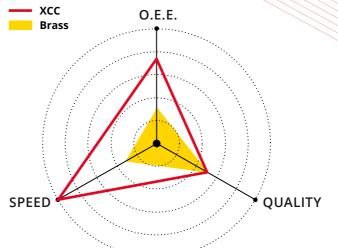


**AVAILABILITY BY SPOOL TYPE AND DIAMETER** 

| THERN                 | ио хсс | K100 | T125 | T160 | T200 | K250 | K355 |
|-----------------------|--------|------|------|------|------|------|------|
| <b>0,25 mm</b> 0.010" | 25XCC  |      |      |      | •    | •    | •    |
| <b>0,30 mm</b> 0.012" | 30XCC  |      |      |      | •    | •    | •    |
| <b>0,33 mm</b> 0.013" | 33XCC  |      |      |      |      | •    |      |

# **SPEED QUALITY**

#### WORLDWIDE HIGHEST **CUTTING SPEED**



#### PATENT RELATED

EP 1 455 981 US 7 687 738 CN ZL 02 8 25126.1 JP 4 516753 BR 0 214 599

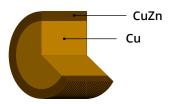
| Core             | Cu α                 |
|------------------|----------------------|
| Coating          | Thick CuZn β         |
| Tensile Strength | 500N/mm <sup>2</sup> |
| Elongation       | 2%                   |
| Conductibility   | 65% IACS             |
|                  |                      |





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#### COPPER CORE, **CUZN COATING**



**THERMO TEX**<sup>®</sup> is well adapted to GFMS AgieCharmilles and ONA machines, and 100% compatible with the THERMO SWX® technology.

Due to its clean wire surface **THERMO TEX**<sup>®</sup> combines a very high level of performance and realistic savings on maintenance of wire EDM machines.

**THERMO TEX**<sup>®</sup> is recommended for a wide range of standard applications in the field of molds, tools or general mechanics.

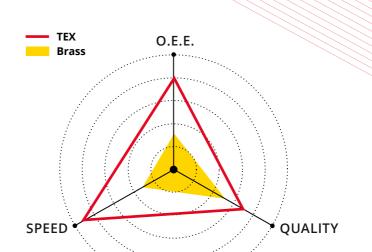
THERMO TEX® wire replaces X wire, fully compatible with its technologies, keeping all the machine parameters. Its cutting speed is up to 35% higher than standard brass and 10% higher than THERMO SWX®.

#### **USAGE RECOMMENDED**









#### LATEST GENERATION OF EDM WIRE, CLEANLINESS AND VERY HIGH SPEED CUTTING WITH THE BEST QUALITY/PRICE RATIO

#### PATENT RELATED

EP 1 009 574 CA 2 302 202

US 5 945 010

EP 1 846 189

TW i391197

CN ZL2006 80004564.6

US 8 378 247

IN 262 000

JP 5 069 134

KR 10-1 653 551

#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERM                 | ио тех | K100 | T125 | T160 | T200 | K250 | K355 | JP5 |
|-----------------------|--------|------|------|------|------|------|------|-----|
| <b>0,25 mm</b> 0.010" | 25 TEX |      | •    |      |      |      | •    |     |
| <b>0,30 mm</b> 0.012" | 30 TEX |      | •    |      |      |      | •    |     |

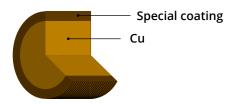
| Core             | Cu α   |
|------------------|--|
| Coating          | CuZn β and Cu <sub>5</sub> Zn <sub>8</sub> γ |
| Tensile Strength | 450N/mm <sup>2</sup>                         |
| Elongation       | 1%   |
| Conductibility   | 70% IACS                                     |
|                  |  |





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#### COPPER CORE, **CUZN COATING**



**THERMO SWX**<sup>®</sup> is dedicated to GFMS AgieCharmilles Machines Robofil type.

Thanks to its cutting speed, **THERMO SWX**® reduces the cost of production in the most varied and complex applications.

It is widely used in the field of molds.

The reference wire for GFMS AgieCharmilles and ONA machines. THERMO SWX® is 30% faster than standard brass.

#### **USAGE RECOMMENDED**









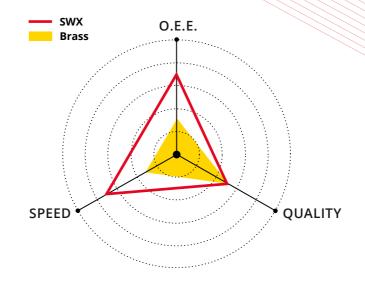
#### **CHARACTERISTICS**

| Core             | Cu α                 |
|------------------|----------------------|
| Coating          | CuZn β               |
| Tensile Strength | 450N/mm <sup>2</sup> |
| Elongation       | 1%                   |
| Conductibility   | 80% IACS             |
|                  |                      |





THE ORIGINAL X WIRE FOR SPEED, WELL ADAPTED FOR GFMS AGIECHARMILLES AND ONA MACHINES



#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERM                 | 10 SWX | K100 | T125 | T160 | T200 | K250 | JP5 |
|-----------------------|--------|------|------|------|------|------|-----|
| <b>0,25 mm</b> 0.010" | 25X    |      |      |      | •    | •    |     |
| <b>0,30 mm</b> 0.012" | 30X    |      |      | •    | _    |      |     |

#### ALSO AVAILABLE ON DEMAND

#### **THERMO SW**<sup>®</sup>: The first coated wire available for EDM machines

- **▶ THERMO SW** <sup>®</sup> is particularly adapted to the generation of GFMS AgieCharmilles machines having the annealing devices and calibration.
- > Cutting speed up to 15% higher than brass wire.



HIGH SPEED & PRECISION





# HIGH SPEED &PRECISION

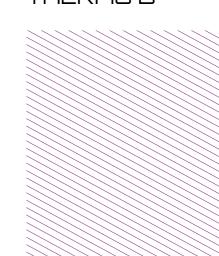
#### **WIRES DEDICATED**

THERMO SE®

THERMO SWO®

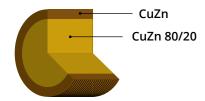
THERMO SWW®

THERMO D®



### 

#### BRASS CORE. **CUZN COATING**



THERMO SE® is suitable for all type of wire EDM machines (GFMS AgieCharmilles, Makino, Vollmer and all Japanese machines).

Highly recommended for all standard applications that require speed and accuracy, particularly in unfavorable flushing conditions.

THERMO SE® is an economical alternative to the use of THERMO SWO®, with superior efficiency.

THERMO SE® offers a processing speed up to 30% higher than a standard brass. The wire surface is extremely clean, reducing machine maintenance. An economical performance with a guaranteed productivity.

#### **USAGE RECOMMENDED**













# **SPEED QUALITY**

O.E.E.

Brass

#### PATENT RELATED

EP 1 009 574

HIGH PERFORMANCE,

ESPECIALLY RECOMMENDED

(HEIGHT > 100 MM) AND FOR

SERIAL MANUFACTURING

FOR MACHINING LARGE PARTS

CA 2 302 202

US 5 945 010

EP 1 846 189

TW i391197

CN ZL2006 80004564,6

US 8 378 247

IN 262 000

JP 5 069 134

KR 10-1 653 551

**AVAILABILITY BY SPOOL TYPE AND DIAMETER** 

| THER                  | MO SE | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|-------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | SE    |      |      |      |      |      | •   |      |      |
| <b>0,25 mm</b> 0.010" | SE    |      |      |      | •    |      | •   |      | •    |
| <b>0,30 mm</b> 0.012" | SE    |      |      |      | •    |      | •   |      |      |
| <b>0,33 mm</b> 0.013" | SE    |      |      |      | •    |      |     |      | •    |

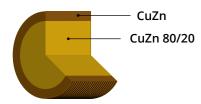
| Core             | Brass80/20                                   |
|------------------|--|
| Coating          | CuZn β and Cu <sub>5</sub> Zn <sub>8</sub> γ |
| Tensile Strength | 750N/mm <sup>2</sup>                         |
| Elongation       | 2%   |
| Conductibility   | 28% IACS                                     |
|                  |  |





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#### **BRASS CORE, CUZN COATING**



THERMO SWO® is suitable for all EDM machines using automatic threading, particularly adapted for latest Agie generation of GFMS AgieCharmilles and Makino machines.

With high electrical and thermal conductivity, THERMO SWO® is dedicated to machines fitted with powerful generator.

It is particularly recommended for applications that require standard accuracy and speed machining.

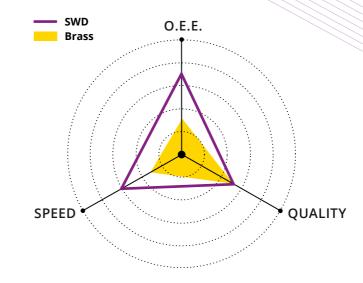
THERMO SWO® offers a processing speed up to 20% higher than a standard brass.

#### **USAGE RECOMMENDED**









#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERM                 | 10 SWD | K100 | T125 | T160 | T200 | K250 | JP5 |
|-----------------------|--------|------|------|------|------|------|-----|
| <b>0,25 mm</b> 0.010" | SW25D  |      |      | •    | •    | •    |     |
| <b>0,30 mm</b> 0.012" | SW30D  |      |      | •    | •    | •    |     |

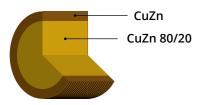
| Core             | Brass80/20           |
|------------------|----------------------|
| Coating          | CuZn β               |
| Tensile Strength | 850N/mm <sup>2</sup> |
| Elongation       | 2%                   |
| Conductibility   | 27% IACS             |
|                  |                      |





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#### **BRASS CORE, CUZN COATING**



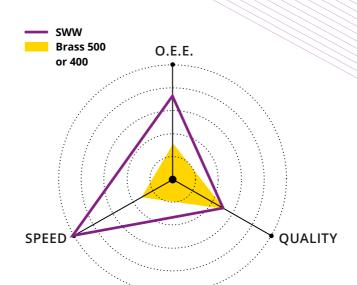
THERMO SWW® is dedicated to machines fitted with powerful generators or the lastest generation: IPG (Intelligent Power Generator).

Its 15% elongation characteristic and a high thermal and electrical conductibility allows to cut 45° conical sections with precision.

THERMO SWW® offers a processing speed up to 20% higher than a standard brass.

#### **USAGE RECOMMENDED**





### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERM                 | IO SWW | K100 | T125 | T160 | T200 | K250 | JP5 |
|-----------------------|--------|------|------|------|------|------|-----|
| <b>0,25 mm</b> 0.010" | SW25W  |      |      | •    | •    | •    |     |
| <b>0,30 mm</b> 0.012" | SW30W  |      |      |      | •    | •    |     |

RECOMMENDED FOR

PARTS UP TO 45°

SPEED CUTTING OF TAPERED

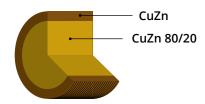
| Core             | Brass80/20           |
|------------------|----------------------|
| Coating          | CuZn β               |
| Tensile Strength | 450N/mm <sup>2</sup> |
| Elongation       | 15%                  |
| Conductibility   | 31% IACS             |
|                  |                      |





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#### **BRASS CORE, CUZN COATING**



THERM□ □® is suitable for all EDM machines using automatic threading, particularly for GFMS AgieCharmilles 100 series and Makino machines.

**THERM**□ □<sup>®</sup> is recommended for applications that require standard accuracy and speed machining.

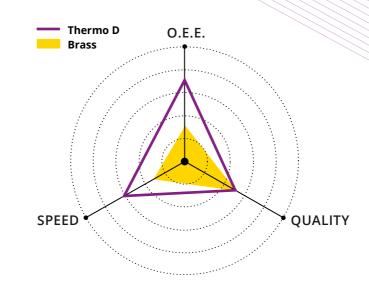
Its high speed erosion is up to 20% faster than brass wire due to its high thermal and electrical conductibility.

THERM□ □® has the same characteristics than THERMO SWD®. Its innovative manufacturing process allows for a very competitive price.

#### **USAGE RECOMMENDED**







### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERM                 | MO D | K100 | T125 | T160 | T200 | K250 | JP5 |
|-----------------------|------|------|------|------|------|------|-----|
| <b>0,25 mm</b> 0.010" | D 25 |      |      |      | •    | •    | •   |
| <b>0,30 mm</b> 0.012" | D 30 |      |      |      |      |      | •   |

THE ORIGINAL WIRE

FOR MACHINES HAVING

A POWERFUL GENERATOR

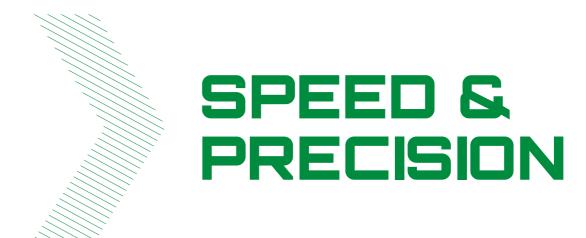
| Core             | Brass80/20           |
|------------------|----------------------|
| Coating          | CuZn                 |
| Tensile Strength | 850N/mm <sup>2</sup> |
| Elongation       | 2%                   |
| Conductibility   | 27% IACS             |
|                  |                      |





28 SPEED & PRECISION 29





#### **WIRES DEDICATED**

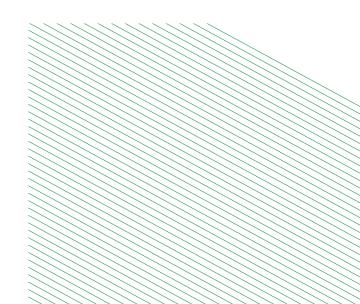
THERMO SD®

THERMO SD2®

THERMO JP®

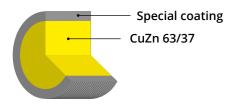
THERMO JP2®

THERMO JP\*®



### 

## MONOPHASED $\alpha$ BRASS CORE, $\gamma$ CU\_sZN\_e GAMMA PHASE COATING



THERMO SO® has been engineered for the GFMS AgieCharmilles machines. It's universal usage is adapted as well to Japanese machines.

Compared to standard brass:

- **THERMO SO®** increases the production of parts up to 20% compared to standard brass.
- **)** It reduces the machining cost of the production of parts requiring high accuracy and good surface finish.

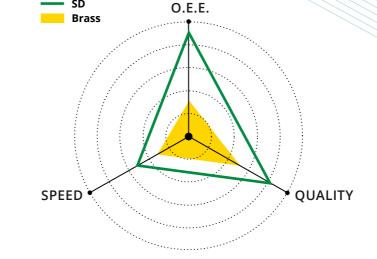
**THERMO SO** <sup>®</sup> is widely used for standard applications in the field of molds, tools or general mechanics.

THERMO SO® increases speed and productivity, even with brass technology due to its unique coating.

#### **USAGE RECOMMENDED**







PATENT RELATED

(SD 900 and SD 500)

US 5 945 010

EP 1 009 574

FOR APPLICATION REQUIRING

WITH GOOD SURFACE FINISH

UNIVERSAL USAGE,

PRECISION IN CUTTING

CA 2 302 202

US 8 338 735

CN ZL 2008 1 000922.7

TW i 350780

CN 101 234 442

JP 5 627 841

KR 10-0981035

EP 1 949 995

**AVAILABILITY BY SPOOL TYPE AND DIAMETER** 

| THER                  | MO SD | K100 | T125 | T160 | T200 | K250 | K355 | JP5 | JP10 | JP15 |
|-----------------------|-------|------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | SD    |      |      |      |      |      |      | -   |      |      |
| <b>0,25 mm</b> 0.010" | SD    |      |      |      | •    |      |      | -   |      | •    |
| <b>0,30 mm</b> 0.012" | SD    |      |      |      | •    |      |      | •   |      |      |
| <b>0,33 mm</b> 0.013" | SD    |      |      |      | •    |      |      |     |      | •    |

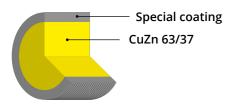
| Core             | Brass 63/37                       |                       |
|------------------|-----------------------------------|-----------------------|
| Coating          | γ Cu <sub>5</sub> Zn <sub>8</sub> |                       |
| Tensile Strength | 450 N/mm <sup>2</sup>             | 900 N/mm <sup>2</sup> |
| Elongation       | 12%                               | 2%                    |
| Conductibility   | 23% IACS                          | 20% IACS              |
|                  |                                   |                       |





### 

#### MONOPHASED $\alpha$ BRASS CORE. DUAL LAYER OF $\beta$ CUZN AND $\gamma$ CU\_SZN\_B COATING



THERMO SD2® is an evolution of THERMO SD® and is the latest generation of EDM wire.

Faster than THERMO SD® due to its special coating, THERMO SD2® provides an excellent price/performance ratio.

THERMO SD2® is recommended for a wide range of standard applications requiring good accuracy and good surface finish.

THERMO SD2 ® is a new EDM wire developed and made by THERMOCOMPACT. Specific technology on GFMS Cut200, Cut300 and Cut400 machines.

#### **USAGE RECOMMENDED**



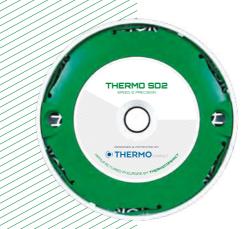






**CHARACTERISTICS** 

| Core             | α Brass 63/37                             |
|------------------|---|
| Coating          | $\beta$ CuZn and $\gamma$ Cu $_5$ Zn $_8$ |
| Tensile Strength | >800 N/mm <sup>2</sup>                    |
| Elongation       | 2%  |
| Conductibility   | 22% IACS                                  |





#### LATEST GENERATION OF WIRE. HIGH SPEED PERFORMANCE AND PRECISION IN CUTTING FOR HIGH PRODUCTIVITY



#### PATENT RELATED

EP 1 009 574

CA 2 302 202

US 5 945 010

EP 1 846 189

TW i391197 CN ZL2006 80004564,6

US 8 378 247

IN 262 000

JP 5 069 134

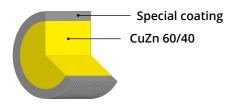
KR 10-1 653 551

| THERM                 | MO SD2 | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|--------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | SD2    |      |      |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | SD2    |      |      |      |      |      |     |      |      |
| <b>0,30 mm</b> 0.012" | SD2    |      |      |      |      |      |     |      |      |



### 

#### DUAL PHASE $\alpha$ + $\beta$ BRASS CORE, $\gamma$ CU<sub>S</sub>ZN<sub>B</sub> GAMMA PHASE COATING



**THERMO JP**® offers the technology of coated wire optimized for Japanese machines without changing the original parameters.

THERMO JP® is recommended to obtain higher accuracy, coating without flakes and good surface finish.

Its threading is particularly good.

THERMO JP® is widely used for standard application in the field of molds, tools or general mechanics.

THERMO JP® increases speed and productivity, creating more erosion on the work piece and less erosion on the wire. THERMO JP® is optimized for Japanese machines without changing the original parameters of brass wire.

#### **USAGE RECOMMENDED**









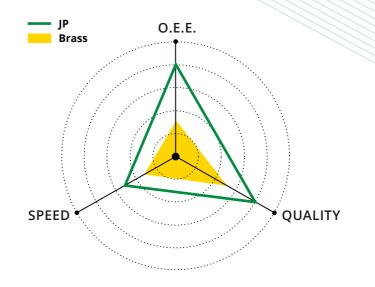
#### **CHARACTERISTICS**

| Core             | Brass 60/40                       |
|------------------|-----------------------------------|
| Coating          | γ Cu <sub>5</sub> Zn <sub>8</sub> |
| Tensile Strength | 900 N/mm <sup>2</sup>             |
| Elongation       | 2%                                |
| Conductibility   | 22% IACS                          |
|                  |                                   |





DESIGNED FOR JAPANESE MACHINES, FOR APPLICATION REQUIRING PRECISION IN CUTTING WITH VERY GOOD SURFACE FINISH



#### PATENT RELATED

US 5 945 010 EP 1 009 574

CA 2 302 202

US 8 338 735

CN ZL 2008 1 000922.7

TW i 350780

CN 101 234 442

JP 5 627 841

KR 10-0981035

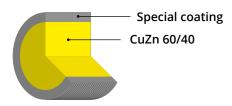
EP 1 949 995

| THER                  | МО ЈР | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|-------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | JP    |      | •    |      |      |      |     | ■    | -    |
| <b>0,25 mm</b> 0.010" | JP    |      | •    |      | •    |      | •   | •    |      |
| <b>0,30 mm</b> 0.012" | JP    |      | •    |      |      |      | •   |      |      |



### 

#### DUAL PHASE $\alpha$ + $\beta$ BRASS CORE, DUAL LAYER OF $\beta$ CUZN AND $\gamma$ CU<sub>5</sub>ZN<sub>6</sub> COATING



THERMO JP2® is an evolution of THERMO JP®, the latest generation of EDM wire, well adapted to Makino and all Japanese machines type.

Due to its special coating, THERMO JP2® is faster than THERMO JP® and provides an excellent price/performance ratio.

Its threading is particularly good.

THERMO JP2® is recommended for a wide range of standard applications requiring good accuracies and surface finish.

THERMO JP2® is a new EDM wire made by THERMOCOMPACT. THERMO JP2® is optimized for Japanese machines without changing the original parameters of brass wire.

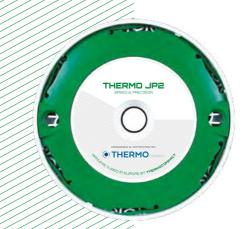
#### **USAGE RECOMMENDED**





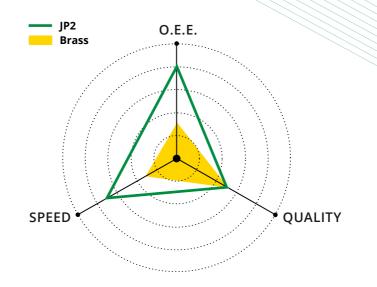
#### **CHARACTERISTICS**

| Core             | Brass 60/40                               |
|------------------|---|
| Coating          | $\beta$ CuZn and $\gamma$ Cu $_5$ Zn $_8$ |
| Tensile Strength | 800 N/mm <sup>2</sup>                     |
| Elongation       | 2%  |
| Conductibility   | 24% IACS                                  |
|                  |   |





NEW EDM WIRE, DESIGNED FOR JAPANESE MACHINES, HIGH SPEED PERFORMANCE AND PRECISION IN CUTTING



#### PATENT RELATED

EP 1 009 574 CA 2 302 202

US 5 945 010

EP 1 846 189

TW i391197

CN ZL2006 80004564,6

US 8 378 247

IN 262 000

JP 5 069 134

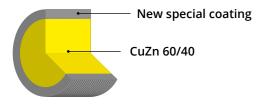
KR 10-1 653 551

| THERN                 | ЛО JP2 | K100 | T125 | T160 | T200 | K250 | K355 | JP5 | JP10 | JP15 |
|-----------------------|--------|------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | JP2    |      |      |      | •    |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | JP2    |      | •    | •    | •    |      |      |     |      |      |
| <b>0,30 mm</b> 0.012" | JP2    |      |      |      | -    |      |      |     |      | •    |



# 

#### DUAL PHASE $\alpha$ + $\beta$ BRASS CORE, $\gamma \, \mathrm{CU_{5}ZN_{8}} \, \mathrm{COATING} \, \, \mathrm{AND}$ NEW SPECIAL COATING



THERMO JP\*® is a new EDM wire: Its auto-threading ability is highly reliable. **THERMO JP**\*®allows a very high level of cleanliness.

Its surface finish is exceptional (Ra= 0,2 μm)

THERMO JP<sup>+®</sup> is the excellent alternative to a brass wire for high productivity.

Next generation of EDM wire, THERMO JP<sup>†®</sup> is a very good technology or the machine. ts cleanliness is remarkable.

#### **USAGE RECOMMENDED**





# polyvalent EDM wire whatever the

#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THER                  | MO JP <sup>+</sup> | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|--------------------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | JP <sup>+</sup>    | •    | •    |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | JP <sup>+</sup>    | •    | •    |      |      |     |      |      |
| <b>0,30 mm</b> 0.012" | JP <sup>+</sup>    | •    | •    | •    | •    |     |      | •    |

LATEST INNOVATION WITH A SPECIAL COATING: EXTREMELY HIGH AUTO-THREADING RELIABILITY. DEDICATED TO JAPANESE MACHINES



PATENT RELATED

US 8067 689 F 856118

| Core             | Brass 60/40  |
|------------------|--|
| Coating          | γ Cu <sub>5</sub> Zn <sub>8</sub> and<br>new special coating |
| Tensile Strength | >900 N/mm <sup>2</sup>                                       |
| Elongation       | 2%   |
| Conductibility   | 22% IACS   |





SUPER PRECISION & SPEED 41





#### **WIRES DEDICATED**

THERMO SA®

THERMO SWA®

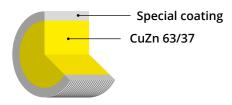
THERMO SWS®

THERMO A®



### 

#### MONOPHASED $\alpha$ BRASS CORE. PATENTED $\gamma$ PHASE COATING



THERMO SA® is a selected coating for excellent precision and surface finish. It is highly recommended for the latest generation of EDM machines from GFMS AgieCharmilles.

THERMO SA® has a special coating that allows high machining speed, and a very clean finish along the cut surfaces (Ra =  $0.05 \mu m$  in carbide).

Combined to a powerful generator, THERMO SA® can reduce up to 20% the costs of machined parts.

Particularly suitable for extremely fine precision cuts and for steel or carbide cutting plates.

Highest stability and accuracy, excellent surface finish. Dedicated technology on GFMS Cut 2000 and Cut 3000 machines.

#### **USAGE RECOMMENDED**





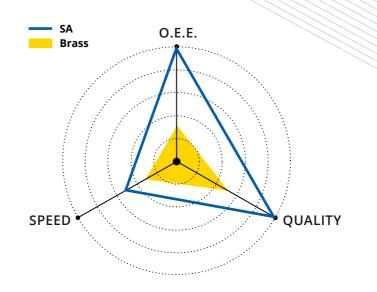


### **CHARACTERISTICS**

| Core             | Brass 63/37                       |
|------------------|-----------------------------------|
| Coating          | γ Cu <sub>5</sub> Zn <sub>8</sub> |
| Tensile Strength | 900 N/mm <sup>2</sup>             |
| Elongation       | 2%                                |
| Conductibility   | 21% IACS                          |
|                  |                                   |



### THE MARKET REFERENCE FOR SURFACE FINISH AND PRECISION



#### PATENT RELATED EP 1 009 574 US 5 945 010 EP 1 949 995 US 8 338 735

TW i350780 CN 101 234 442 JP 5 627 841 KR 10-0981035

CN ZL 2008 1 0009227.7

| THERMO SA              | A 900 / 500 / 400 | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|------------------------|-------------------|------|------|------|------|------|-----|------|------|
| <b>0,07 mm</b> 0.003"  | 900               | •    |      |      |      |      |     |      |      |
| <b>0,10 mm</b> 0.004"  | 900               | •    |      |      |      |      |     |      |      |
| <b>0,127 mm</b> 0.005" | 900               |      |      |      |      |      | •   |      |      |
| <b>0,15 mm</b> 0.006"  | 900               |      |      | •    |      |      |     |      |      |
| <b>0,20 mm</b> 0.008"  | 900 / 500 / 400   |      |      |      |      |      | -   |      |      |
| <b>0,25 mm</b> 0.010"  | 900 / 500 / 400   |      |      | •    |      |      | •   |      |      |
| <b>0,30 mm</b> 0.012"  | 900 / 500 / 400   |      |      |      |      |      |     |      |      |



### 

#### MONOPHASED $\alpha$ BRASS CORE. PATENTED $\beta$ + $\gamma$ PHASE COATING

#### **CHARACTERISTICS**

| Core             | Brass 63/37                               |
|------------------|---|
| Coating          | $\beta$ CuZn and $\gamma$ Cu $_5$ Zn $_8$ |
| Tensile Strength | 500 N/mm <sup>2</sup>                     |
| Elongation       | 20%                                       |
| Conductibility   | 25% IACS                                  |

Due to its special surface coating and its quality, THERMO SA 500 ® combines a perfect surface finish and an excellent productivity in unfavorable machining conditions. THERMO SA 500 8 is particularly suitable for tapered cuts up to 15°.

# 

#### MONOPHASED $\alpha$ BRASS CORE. PATENTED $\beta + \gamma$ PHASE COATING

#### **CHARACTERISTICS**

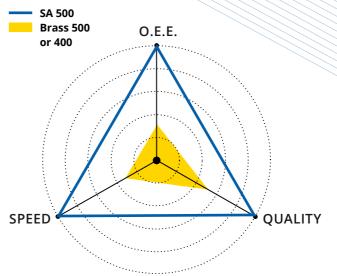
| Core             | Brass 63/37                                  |
|------------------|--|
| Coating          | β CuZn and γ Cu <sub>5</sub> Zn <sub>8</sub> |
| Tensile Strength | 400 N/mm <sup>2</sup>                        |
| Elongation       | 30%  |
| Conductibility   | 26% IACS                                     |

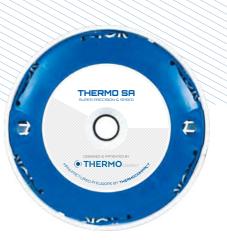
THERMO SA 400 8, with its special surface coating and its quality, is particularly suitable for tapered cuts up to 45° with appropriate wire guides and software.

For the new generation of EDM machines, THERMO SA 400 ® is a good alternative to the THERMO SWW®, for more cleanliness and precision.

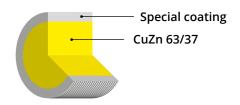


THE PERFECT WIRE FOR TAPERED CUTTING: HIGH PRECISION AND CLEAN FINISH, RECOMMENDED FOR AGIE CUT200, CUT300 AND **CUT400 MACHINES** 





SUPER PRECISION & SPEED 45



#### PATENT RELATED

EP 1 009 574

US 5 945 010

EP 1 949 995

US 8 338 735

CN ZL 2008 1 0009227.7

TW i350780

KR 10-1 653 551

#### **USAGE RECOMMENDED**



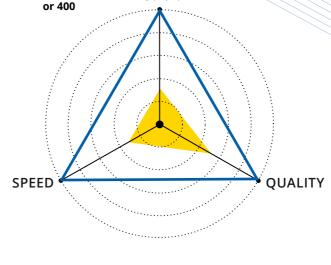
**QUALITY** 





MANUFACTURED IN EUROPE BY THERMOCOMPACT MANUFACTURED IN EUROPE **CLICK HERE FOR MORE INFORMATIONS** 





O.E.E.

SA 400

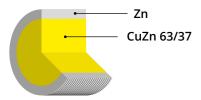
**SPEED** 

Brass 500

SUPER PRECISION & SPEED

### 

#### BRASS CORE. ZINC COATING



THERMO SWA® has an excellent straightness and a zinc coating of very high purity.

It obtains high geometric precision and a perfect finish of the machined parts.

THERMO SWA® is recommended for a large range of standard applications: manufacture of molds, cutting tools, mechanical works requiring extreme accuracy and excellent quality of surface cutting (Ra =  $0.10 \mu m$  in steel).

THERMO SWA® has a low brass contamination of the part with reduced risk of corrosion in water dielectric, especially for H13 steel and tungsten carbide.

Highly proven reliability during machining, THERMO SWA® is suitable for automatic threading.

#### **USAGE RECOMMENDED**







#### **CHARACTERISTICS**

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Coating          | Zinc                  |
| Tensile Strength | 900 N/mm <sup>2</sup> |
| Elongation       | 1.5%                  |
| Conductibility   | 22% IACS              |
|                  |                       |



#### THE REFERENCE FOR MACHINING WITH EXCELLENT SURFACE FINISH, REDUCED RISK OF CORROSION FOR THE PART



PATENT RELATED

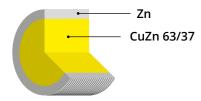
EP 1 379 353 US 8 519 294

| THERM                  | O SWA   | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|------------------------|---------|------|------|------|------|------|-----|------|------|
| <b>0,07 mm</b> 0.003"  | SW07A   | •    |      |      |      |      |     |      |      |
| <b>0,10 mm</b> 0.004"  | SW10A   | •    | •    |      |      |      |     |      |      |
| <b>0,127 mm</b> 0.005" | SW0127A |      | •    |      |      |      | •   |      |      |
| <b>0,15 mm</b> 0.006"  | SW015A  |      | •    |      |      |      | •   |      |      |
| <b>0,20 mm</b> 0.008"  | SW20A   |      | •    |      |      |      | •   |      | •    |
| <b>0,25 mm</b> 0.010"  | SW25A   |      | •    |      |      |      | •   |      | •    |
| <b>0,30 mm</b> 0.012"  | SW30A   |      | •    |      |      |      | •   |      |      |



### 

#### **BRASS CORE.** ZINC COATING



**THERMO SWS**<sup>®</sup> has a high elongation coefficient, a zinc coating of very high purity and is suitable for automatic threading.

Due to its superior conductibility, **THERMO SWS**® is recommended for conical tapered cutting.

It obtains high precision in machining complex parts with an angle of more than 7° and below 15°. It provides excellent surface finish in unfavorable conditions.

Its technical characteristics provide homogeneity and high level of surface quality in all machining conditions.

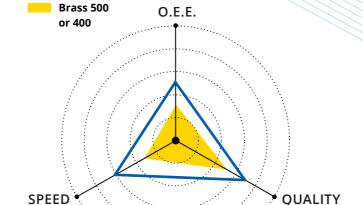
#### **USAGE RECOMMENDED**











- SWS

#### **PATENT RELATED**

EP 1 379 353 US 8 519 294

HOMOGENEITY, HIGH QUALITY,

SUITABLE FOR TAPER CUTS

OF ANGLES ABOVE 7°

AND BELOW 15°

**AVAILABILITY BY SPOOL TYPE AND DIAMETER** 

| THERM                 | 10 SWS | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|--------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | SW20A  |      |      |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | SW25A  |      |      | •    |      | •    |     |      |      |
| <b>0,30 mm</b> 0.012" | SW30A  |      |      |      |      |      |     |      |      |

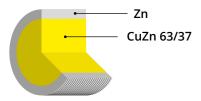
| Core             | Brass 63/37           |
|------------------|-----------------------|
| Coating          | Zinc                  |
| Tensile Strength | 450 N/mm <sup>2</sup> |
| Elongation       | 15%                   |
| Conductibility   | 25% IACS              |
|                  |                       |





### 

#### BRASS CORE, ZINC COATING



THERMO A® was developed to meet the highest demands of users wire EDM machines. It is suitable for almost all EDM machines.

**THERMO A®** offers a very competitive price without compromising performance on precision, surface quality and threading.

**THERMO A**<sup>®</sup> is recommended for a wide range of standard applications: manufacture of molds, cutting tools, mechanical works requiring extreme accuracy and excellent surface quality finish.

THERMO A<sup>®</sup> is a coated brass which provides a high performance with a very competitive price. THERMO A® obtains an exceptional surface finish:  $Ra = 0.15 \mu m$ .

#### **USAGE RECOMMENDED**







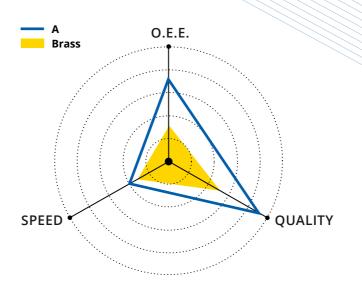


#### **CHARACTERISTICS**

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Coating          | Zinc                  |
| Tensile Strength | 900 N/mm <sup>2</sup> |
| Elongation       | 1.5%                  |
| Conductibility   | 22% IACS              |
|                  |                       |



### SELECTED COATING, VERY GOOD SURFACE FINISH AND ACCURACY



#### **PATENT RELATED**

EP 1 379 353 US 8 519 294

| THER                  | мо а | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | A20  |      |      |      |      |      | •   |      |      |
| <b>0,25 mm</b> 0.010" | A25  |      |      | •    | •    | •    | -   |      |      |
| <b>0,30 mm</b> 0.012" | A30  |      |      |      |      | •    | •   |      |      |



52 ALL PURPOSE





#### **WIRES DEDICATED**

THERMO brass 1000®

THERMO brass 900 ®

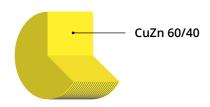
THERMO brass 500®

THERMO brass 400®

THERMO First 900 and 500  $^{\rm e}$ 

ALL PURPOSE | 53

## THERMO brass 1000°



THERMO brass 1000 N/mm² is suitable for all EDM machines, and recommended for Japanese machines.

THERMO brass 1000 sis produced with a very pure alloy, and provides an excellent surface quality and an ongoing performance.

THERMO brass 1000 sis recommended for standard applications. It can produce high precision parts with excellent surface finish due to its very good geometry and its cleanliness.

Due to its specific alloy, THERMO brass 1000® is recommended in particular for Fanuc, Mitsubishi, Hitachi and Sodick type machines.

#### **USAGE RECOMMENDED**







#### **CHARACTERISTICS**

| Core             | Brass 60/40            |
|------------------|------------------------|
| Tensile Strength | 1050 N/mm <sup>2</sup> |
| Elongation       | 2.5%                   |
| Conductibility   | 22% IACS               |
|                  |                        |





PURE 60/40 ALLOY, HIGH SURFACE QUALITY, HIGH CLEANLINESS, HIGH PRECISION PARTS

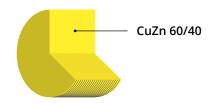
#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THERMO E              | BRASS 1000 | K100 | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|------------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | TB 1000    |      |      |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | TB 1000    |      |      |      |      |      |     |      |      |
| <b>0,30 mm</b> 0.012" | TB 1000    |      |      |      |      |      |     |      |      |

Other type of spools available only on special request.



## TurboBrass®



Thermocompact has developed an innovative manufacturing process that allows us to offer our TurboBrass® wire with the following benefits:

- UNIVERSAL USAGE with WEDM Brass machining parameters
- UP TO 15% FASTER than conventional brass wire
- Good THREADING ABILITY
- Exceptional **CLEANLINESS**
- COMPETITIVE PRICE

TurboBrass® has confirmed its performance since 2015.

#### **USAGE RECOMMENDED**







#### **CHARACTERISTICS**

| Core             | Brass 60/40 |
|------------------|-------------|
| Tensile Strength | 900 MPa     |
| Elongation       | 2.5%        |
| Conductibility   | 22% IACS    |





#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| TURBO                 | DBRASS | K100 | T125 | K160 | K200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|--------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | ТВ     |      |      |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | ТВ     |      |      |      | •    | •    |     |      |      |
| <b>0,30 mm</b> 0.012" | ТВ     |      |      |      | •    |      |     |      |      |

Other type of spools available only on special request.

### THERMO brass 900°

#### **CHARACTERISTICS**

| Core             | Brass 63/37 - Brass 60/40 |
|------------------|---------------------------|
| Tensile Strength | 900 N/mm <sup>2</sup>     |
| Elongation       | 1.5%                      |
| Conductibility   | 22% IACS                  |

THERMO brass 900 ® N/mm² is suitable for all type of EDM machines.

THERMO brass 900 ® is recommended for standard applications requiring extreme accuracy and a good surface finish.

#### **USAGE RECOMMENDED**







### THERMO brass 500°

#### **CHARACTERISTICS**

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Tensile Strength | 500 N/mm <sup>2</sup> |
| Elongation       | 20%                   |
| Conductibility   | 25% IACS              |

THERMO brass 500 ® N/mm 2 is suitable for all type of EDM machines. It is recommended for standard applications for machining complex parts requiring high taper angle cutting of the wire up to 12°.

#### **USAGE RECOMMENDED**





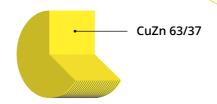








#### HIGH GRADE OF 63/37 ALLOY RECOMMENDED FOR ALL TYPE OF EDM MACHINES



### THERMO brass 400°

#### **CHARACTERISTICS**

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Tensile Strength | 450 N/mm <sup>2</sup> |
| Elongation       | 25%                   |
| Conductibility   | 26% IACS              |

THERMO brass 400 ® is suitable for all type of EDM machines.

THERMO brass 400 ® N/mm<sup>2</sup> is recommended for machining complex parts that require high taper angle cutting of the wire up to 20°.

#### **USAGE RECOMMENDED**





| THERMO BRA            | ASS 900 / 500 / 400 | K100 | T125 | T160 | T200 | K250 | K355 | JP5 | JP10 | JP15 |
|-----------------------|---------------------|------|------|------|------|------|------|-----|------|------|
| <b>0,10 mm</b> 0.004" | 900                 | •    |      |      |      |      |      |     |      |      |
| <b>0,15 mm</b> 0.006" | 900                 |      |      |      |      |      |      |     |      |      |
| <b>0,20 mm</b> 0.008" | 900, 500, 400       |      |      |      |      |      |      |     |      | •    |
| <b>0,25 mm</b> 0.010" | 900, 500, 400       |      |      | •    |      |      | -    |     | •    | •    |
| <b>0,30 mm</b> 0.012" | 900, 500, 400       |      |      |      |      |      |      |     |      | •    |



## THERMO First 900°



**CHARACTERISTICS** 

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Tensile Strength | 900 N/mm <sup>2</sup> |
| Elongation       | 1.5%                  |
| Conductibility   | 22% IACS              |
|                  |                       |

THERMO First 900 \* is developed with full automatic production process.



## THERMO First 500°

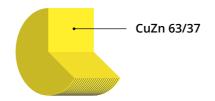
#### **CHARACTERISTICS**

| Core             | Brass 63/37           |
|------------------|-----------------------|
| Tensile Strength | 500 N/mm <sup>2</sup> |
| Elongation       | 1.5%                  |
| Conductibility   | 22% IACS              |

THERMO First 500 <sup>®</sup> is developed with full automatic production process.



#### STANDARD BRASS WIRE, WITH A COMPETITIVE PRICE



THERMO First 900 and
THERMO First 500 offer the
benefits of a brass wire associating
quality and competitive prices.
They are recommended for standard
applications.

#### **USAGE RECOMMENDED**







| THERMO FI             | RST 900 - 500          | K100 | T125 | T160 | T200 | K250 | K355 | JP5 | JP10 | JP15 |
|-----------------------|------------------------|------|------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | First 900<br>First 500 |      |      | -    |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | First 900<br>First 500 |      |      | -    |      |      | •    |     |      |      |
| <b>0,30 mm</b> 0.012" | First 900<br>First 500 |      |      | -    |      |      |      |     |      |      |



62 ZINC FREE





#### **WIRES DEDICATED**

THERMO ZF®

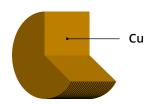
THERMO ZF\*®

THERMO ZF sigma®

#### Zinc free Wire

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#### PLAIN COPPER



THERMO ZF<sup>®</sup> is a new EDM wire, free of zinc. Recommended especially when no zinc deposit is mandatory.

The THERMO ZF® wire is an economically priced wire.

Convenient for all machining usage THERMO ZF® is particularly recommended for the cutting of nickel-based alloy.

#### **USAGE RECOMMENDED**





#### **AVAILABILITY BY SPOOL TYPE AND DIAMETER**

| THER                  | MO ZF | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|-------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | ZF    | •    | •    |      |      |     |      | •    |
| <b>0,25 mm</b> 0.010" | ZF    | •    | •    |      | •    |     |      | •    |
| <b>0,30 mm</b> 0.012" | ZF    | •    | •    | ■    |      |     |      | •    |

ZINC FREE EDM WIRE,

WITH EXCEPTIONAL

CONDUCTIBILITY

| Material         | Cu 100%              |
|------------------|----------------------|
| Tensile Strength | 500N/mm <sup>2</sup> |
| Elongation       | 1.4%                 |
| Conductibility   | 94% IACS             |

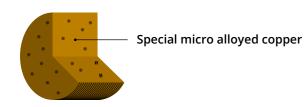




#### Zinc free Wire

# 

#### SPECIAL MICRO ALLOYED COPPER



THERMO ZF<sup>+®</sup> is a new EDM wire free of zinc with a special micro allied copper.

It offers a processing speed higher than THERMO ZF<sup>+®</sup> and maintain its high tensile strength.

Its special micro allied copper allows THERMO ZF \*8 to obtain a high tensile strengt.

#### **USAGE RECOMMENDED**









ZINC FREE EDM WIRE WITH HIGH TENSILE

ITS SPECIAL ALLOY

STRENGTH THANKS TO

#### **CHARACTERISTICS**

| Material         | Special micro<br>alloyed copper |
|------------------|---------------------------------|
| Tensile Strength | 800N/mm <sup>2</sup>            |
| Elongation       | 2.7%                            |
| Conductibility   | 72% IACS                        |
|                  |                                 |

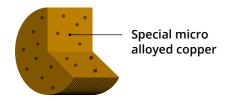


| THERM                 | ИО ZF <sup>+</sup> | T125 | T160 | T200 | K250 | JP5 | JP10 | JP15 |
|-----------------------|--------------------|------|------|------|------|-----|------|------|
| <b>0,20 mm</b> 0.008" | ZF <sup>+</sup>    | •    |      |      |      |     |      |      |
| <b>0,25 mm</b> 0.010" | ZF+                | •    | •    |      | •    |     |      |      |
| <b>0,30 mm</b> 0.012" | ZF+                | •    | •    |      | •    |     |      |      |



# 

#### SPECIAL MICRO ALLOYED COPPER



THERMO ZFsigma® is a new EDM wire without zinc, offering superior performances:

- high processing speed,
- **)** high conductibility.

The THERMO ZF sigma <sup>®</sup> is dedicated to aerospace production, particularly for nickel base alloys.

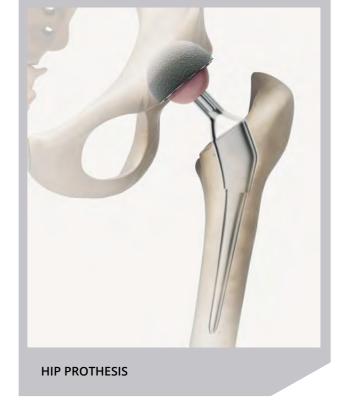
It is particularly recommended to improve the speed when cutting nickel based alloys and obtaining a straight part. Non volatile elements during machining process.

#### **USAGE RECOMMENDED**









#### **CHARACTERISTICS**

| Material         | Spécial micro<br>alloyed copper |
|------------------|---------------------------------|
| Tensile Strength | 800N/mm <sup>2</sup>            |
| Elongation       | 3 to 6%                         |
| Conductibility   | 93% IACS                        |
|                  |                                 |





ZINC FREE 69

ZINC FREE EDM WIRE

NON VOLATILE



### PLAN YOUR PRODUCTION

#### SPOOL MACHINING DURATION FOR 1 SPOOL

| SPOOL<br>TYPE |       | IRE<br>IETER |     | L WEIGHT<br>POOL * | NOMINAL LENGTH PER SPOOL * |        | 10m/min<br>33 ft/min | 12m/min<br>39,4 ft/min | 15m/min<br>49,21ft/min | 16m/min<br>52,5ft/min |
|---------------|-------|--------------|-----|--------------------|----------------------------|--------|----------------------|------------------------|------------------------|-----------------------|
|               | mm    | inch         | kg  | lbs                | m                          | ft     | h                    | h                      | h                      | h                     |
| K100          | 0.07  | 0.003        | 1.8 | 4                  | 58500                      | 191929 | 98                   | 81                     | 65                     | 61                    |
|               | 0.10  | 0.004        | 1.8 | 4                  | 27000                      | 88582  | 45                   | 38                     | 30                     | 28                    |
|               | 0.127 | 0.005        | 1.8 | 4                  | 16800                      | 55118  | 28                   | 23                     | 19                     | 18                    |
|               | 0.15  | 0.006        | 1.8 | 4                  | 12000                      | 39370  | 20                   | 17                     | 13                     | 13                    |
| K125          | 0.10  | 0.004        | 4   | 8.8                | 60000                      | 196850 | 100                  | 83                     | 67                     | 63                    |
| T125          | 0.127 | 0.005        | 4   | 8.8                | 37300                      | 122375 | 62                   | 52                     | 41                     | 39                    |
|               | 0.15  | 0.006        | 4   | 8.8                | 26700                      | 87598  | 45                   | 37                     | 30                     | 28                    |
|               | 0.20  | 0.008        | 4   | 8.8                | 14900                      | 48884  | 25                   | 21                     | 17                     | 16                    |
|               | 0.25  | 0.01         | 4   | 8.8                | 9600                       | 31496  | 16                   | 13                     | 11                     | 10                    |
|               | 0.30  | 0.012        | 4   | 8.8                | 6600                       | 21653  | 11                   | 9                      | 7                      | 7                     |
| K160          | 0.127 | 0.005        | 8   | 17.6               | 74600                      | 244750 | 124                  | 104                    | 83                     | 78                    |
| T160          | 0.15  | 0.006        | 8   | 17.6               | 53400                      | 175196 | 89                   | 74                     | 59                     | 56                    |
|               | 0.20  | 0.008        | 8   | 17.6               | 29900                      | 98097  | 50                   | 42                     | 33                     | 31                    |
|               | 0.25  | 0.01         | 8   | 17.6               | 19200                      | 62992  | 32                   | 27                     | 21                     | 20                    |
|               | 0.30  | 0.012        | 8   | 17.6               | 13200                      | 43307  | 22                   | 18                     | 15                     | 14                    |
|               | 0.33  | 0.013        | 8   | 17.6               | 10700                      | 35105  | 18                   | 15                     | 12                     | 11                    |
| K200          | 0.20  | 0.008        | 16  | 35.2               | 59800                      | 196194 | 100                  | 83                     | 66                     | 62                    |
| T200          | 0.25  | 0.01         | 16  | 35.2               | 38400                      | 125984 | 64                   | 53                     | 43                     | 40                    |
|               | 0.30  | 0.012        | 16  | 35.2               | 26500                      | 86942  | 44                   | 37                     | 29                     | 28                    |
|               | 0.33  | 0.013        | 16  | 35.2               | 21400                      | 70210  | 36                   | 30                     | 24                     | 22                    |
| K250          | 0.25  | 0.01         | 25  | 55                 | 60000                      | 196850 | 100                  | 83                     | 67                     | 63                    |
|               | 0.30  | 0.012        | 25  | 55                 | 41400                      | 135826 | 69                   | 58                     | 46                     | 43                    |
|               | 0.33  | 0.013        | 25  | 55                 | 33400                      | 109580 | 56                   | 46                     | 37                     | 35                    |
| K355          | 0.25  | 0.01         | 45  | 99                 | 106000                     | 347768 | 177                  | 147                    | 118                    | 110                   |
|               | 0.30  | 0.012        | 45  | 99                 | 73500                      | 241141 | 123                  | 102                    | 82                     | 77                    |
|               | 0.33  | 0.013        | 45  | 99                 | 60700                      | 199146 | 101                  | 84                     | 67                     | 63                    |

### STANDARD DIN

| CDOOL | BAACH | INIINIC | DUDATI | ONITOD | 1 SPOOL |
|-------|-------|---------|--------|--------|---------|
| SPOOL | MACH  | IININ(7 | DUKATI | ONFOR  | TSPOOL  |

|      |   |   |  |  |   | 3FOOL MACHINING DONATION TOK 1 3FOOL   |  |  |   |                       |
|------|---|---|--|--|---|--|--|--|---|-----------------------|
|      |   |   | WIRE<br>DIAMETER   |  |   |  | 10m/min<br>33 ft/min   | 12m/min<br>39,4 ft/min   | 15m/min<br>49,21ft/min  | 16m/min<br>52,5ft/min |
| mm   | inch  | kg  | lbs  | m  | ft  | h  | h  | h  | h   |                       |
| 0.10 | 0.004   | 5   | 11   | 75000  | 246062  | 125  | 104  | 83   | 78  |                       |
| 0.13 | 0.005   | 5   | 11   | 46700  | 153215  | 78   | 65   | 52   | 49  |                       |
| 0.15 | 0.006   | 5   | 11   | 33500  | 109908  | 56   | 47   | 37   | 35  |                       |
| 0.20 | 0.008   | 5   | 11   | 18700  | 61352   | 31   | 26   | 21   | 19  |                       |
| 0.25 | 0.01  | 5   | 11   | 12000  | 39370   | 20   | 17   | 13   | 13  |                       |
| 0.30 | 0.012   | 5   | 11   | 8300   | 27231   | 14   | 12   | 9  | 9   |                       |
| 0.20 | 0.008   | 10  | 22   | 37500  | 123031  | 63   | 52   | 42   | 39  |                       |
| 0.25 | 0.01  | 10  | 22   | 24000  | 78740   | 40   | 33   | 27   | 25  |                       |
| 0.30 | 0.012   | 10  | 22   | 16600  | 54462   | 28   | 23   | 18   | 17  |                       |
| 0.20 | 0.008   | 20  | 44   | 74800  | 245406  | 125  | 104  | 83   | 78  |                       |
| 0.25 | 0.01  | 20  | 44   | 48000  | 157480  | 80   | 67   | 53   | 50  |                       |
| 0.30 | 0.012   | 20  | 44   | 33100  | 108595  | 55   | 46   | 37   | 34  |                       |
| 0.33 | 0.013   | 20  | 44   | 26500  | 86942   | 44   | 37   | 29   | 28  |                       |
|      | DIAM mm 0.10 0.13 0.15 0.20 0.25 0.30 0.20 0.25 0.30 0.20 0.25 0.30 | mm         inch           0.10         0.004           0.13         0.005           0.15         0.006           0.20         0.008           0.25         0.01           0.30         0.012           0.25         0.01           0.30         0.012           0.25         0.01           0.30         0.012           0.20         0.008           0.25         0.01           0.30         0.012           0.30         0.012 | DIAMETER         PER SP           mm         inch         kg           0.10         0.004         5           0.13         0.005         5           0.15         0.006         5           0.20         0.008         5           0.25         0.01         5           0.30         0.012         5           0.20         0.008         10           0.25         0.01         10           0.30         0.012         10           0.20         0.008         20           0.25         0.01         20           0.25         0.01         20           0.30         0.012         20 | DIAMETER         PER SPOOL *           mm         inch         kg         lbs           0.10         0.004         5         11           0.13         0.005         5         11           0.15         0.006         5         11           0.20         0.008         5         11           0.25         0.01         5         11           0.30         0.012         5         11           0.20         0.008         10         22           0.25         0.01         10         22           0.30         0.012         10         22           0.20         0.008         20         44           0.25         0.01         20         44           0.30         0.012         20         44 | DIAMETER         PER SPOOL *         PER SI           mm         inch         kg         lbs         m           0.10         0.004         5         11         75000           0.13         0.005         5         11         46700           0.15         0.006         5         11         33500           0.20         0.008         5         11         18700           0.25         0.01         5         11         8300           0.20         0.008         10         22         37500           0.20         0.008         10         22         24000           0.30         0.012         10         22         16600           0.20         0.008         20         44         74800           0.25         0.01         20         44         48000           0.30         0.012         20         44         33100 | DIAMETER         PER SPOOL *         PER SPOOL *           mm         inch         kg         lbs         m         ft           0.10         0.004         5         11         75000         246062           0.13         0.005         5         11         46700         153215           0.15         0.006         5         11         33500         109908           0.20         0.008         5         11         18700         61352           0.25         0.01         5         11         12000         39370           0.30         0.012         5         11         8300         27231           0.20         0.008         10         22         37500         123031           0.25         0.01         10         22         24000         78740           0.30         0.012         10         22         16600         54462           0.20         0.008         20         44         74800         245406           0.25         0.01         20         44         48000         157480           0.30         0.012         20         44         33100         108595 <td>DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min           mm         inch         kg         lbs         m         ft         h           0.10         0.004         5         11         75000         246062         125           0.13         0.005         5         11         46700         153215         78           0.15         0.006         5         11         33500         109908         56           0.20         0.008         5         11         18700         61352         31           0.25         0.01         5         11         12000         39370         20           0.30         0.012         5         11         8300         27231         14           0.20         0.008         10         22         37500         123031         63           0.25         0.01         10         22         24000         78740         40           0.30         0.012         10         22         16600         54462         28           0.20         0.008         20         44         74800         245406         125           0.25         0.01</td> <td>DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min         39,4 ft/min           mm         inch         kg         lbs         m         ft         h         h           0.10         0.004         5         11         75000         246062         125         104           0.13         0.005         5         11         46700         153215         78         65           0.15         0.006         5         11         33500         109908         56         47           0.20         0.008         5         11         18700         61352         31         26           0.25         0.01         5         11         12000         39370         20         17           0.30         0.012         5         11         8300         27231         14         12           0.20         0.008         10         22         37500         123031         63         52           0.25         0.01         10         22         24000         78740         40         33           0.30         0.012         10         22         16600         54462         28         23</td> <td>DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min         39,4 ft/min         49,21ft/min           mm         inch         kg         lbs         m         ft         h         h         h           0.10         0.004         5         11         75000         246062         125         104         83           0.13         0.005         5         11         46700         153215         78         65         52           0.15         0.006         5         11         33500         109908         56         47         37           0.20         0.008         5         11         18700         61352         31         26         21           0.25         0.01         5         11         12000         39370         20         17         13           0.30         0.012         5         11         8300         27231         14         12         9           0.20         0.008         10         22         37500         123031         63         52         42           0.25         0.01         10         22         24000         78740         40         33</td> | DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min           mm         inch         kg         lbs         m         ft         h           0.10         0.004         5         11         75000         246062         125           0.13         0.005         5         11         46700         153215         78           0.15         0.006         5         11         33500         109908         56           0.20         0.008         5         11         18700         61352         31           0.25         0.01         5         11         12000         39370         20           0.30         0.012         5         11         8300         27231         14           0.20         0.008         10         22         37500         123031         63           0.25         0.01         10         22         24000         78740         40           0.30         0.012         10         22         16600         54462         28           0.20         0.008         20         44         74800         245406         125           0.25         0.01 | DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min         39,4 ft/min           mm         inch         kg         lbs         m         ft         h         h           0.10         0.004         5         11         75000         246062         125         104           0.13         0.005         5         11         46700         153215         78         65           0.15         0.006         5         11         33500         109908         56         47           0.20         0.008         5         11         18700         61352         31         26           0.25         0.01         5         11         12000         39370         20         17           0.30         0.012         5         11         8300         27231         14         12           0.20         0.008         10         22         37500         123031         63         52           0.25         0.01         10         22         24000         78740         40         33           0.30         0.012         10         22         16600         54462         28         23 | DIAMETER         PER SPOOL *         PER SPOOL *         33 ft/min         39,4 ft/min         49,21ft/min           mm         inch         kg         lbs         m         ft         h         h         h           0.10         0.004         5         11         75000         246062         125         104         83           0.13         0.005         5         11         46700         153215         78         65         52           0.15         0.006         5         11         33500         109908         56         47         37           0.20         0.008         5         11         18700         61352         31         26         21           0.25         0.01         5         11         12000         39370         20         17         13           0.30         0.012         5         11         8300         27231         14         12         9           0.20         0.008         10         22         37500         123031         63         52         42           0.25         0.01         10         22         24000         78740         40         33 |                       |

<sup>\*</sup> Average weight and length



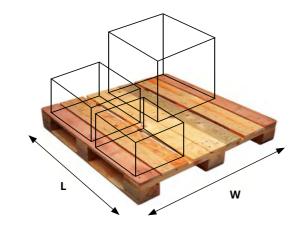
### DATA FOR PLANNING YOUR DEMAND AND STORAGE

| SPOOL<br>TYPE | SPOOL<br>WEIGHT          | SPOOLS<br>PER PALLET                        | SPOOLS<br>PER BOX                               | WEIGHT<br>PER BOX        | BOXES PER LAYER<br>NUMBER OF LAYER | NET WEIGHT<br>PER PALLET   |
|---------------|--------------------------|---|---|--------------------------|------------------------------------|----------------------------|
| K100          | <b>1,8 Kg</b><br>4 Lbs   | diam 0,07 / 0,10<br><b>36</b>               | <b>4</b> (with individual pre packaging in box) | <b>7,2 Kg</b><br>16 Lbs  | 6 boxes<br>1 layer + 3 boxes       | <b>64,8 kg</b><br>144 lbs  |
|               | <b>2 Kg</b><br>4,4 Lbs   | diam 0,10<br><b>24</b>                      | <b>2</b> (with individual pre packaging in box) | <b>8kg</b><br>8,8 lbs    | 6 boxes<br>2 layers                | <b>96 kg</b><br>140.8 lbs  |
| K125          |                          | diam 0,10<br>0,127 / 0,15                   | 1   | <b>4kg</b><br>8,8 lbs    | 24 boxes<br>2 layers               | 192 kg                     |
| T125          | <b>4 Kg</b><br>8,8 Lbs   | 0,12770,15<br><b>48</b>                     | <b>2</b> (with individual pre packaging in box) | <b>8kg</b><br>17,6 lbs   | 10 boxes<br>2 layers + 4 boxes     | 423.3 lbs                  |
|               |                          | diam 0,20 / 0,25 / 0,30<br><b>96</b>        | 4   | <b>16kg</b><br>32,2 lbs  | 6 boxes<br>4 layers                | <b>384 kg</b><br>844.8 lbs |
| K160          |                          | diam 0,15<br><b>30</b> (half pallet)        | 2   | 35,2 lbs                 | 10 boxes.<br>1 layer + 5 boxes     | <b>240 kg</b><br>528 lbs   |
| T160          |                          | diam 0,20 / 0,25 / 0,30 / 0,33<br><b>60</b> | 2   | 16kg                     | 10 boxes<br>3 layers               | <b>480 kg</b><br>1056 lbs  |
| K200<br>T200  | <b>16 Kg</b><br>35,2 Lbs | 24  | 1   | <b>16 Kg</b><br>35,2 Lbs | 12 boxes<br>2 layers               | <b>384 kg</b><br>844.8 lbs |
| K250          | <b>25 Kg</b><br>55 Lbs   | 18  | 1   | <b>25 kg</b><br>55 lbs   | 9 boxes<br>2 layers                | <b>450 kg</b><br>990 lbs   |
| K355          | <b>45Kg</b><br>99 Lbs    | 6   | 1   | <b>45kg</b><br>99 lbs    | 6 box<br>1 layer                   | <b>270 kg</b><br>594 lbs   |
| IDE           | 5 Kg                     | diam 0,15<br><b>48</b>                      | _   | 20 kg                    | 6 boxes<br>2 layers                | <b>240 kg</b><br>528 lbs   |
| JPS           | JP5 11 Lbs               | 96  | 4   | 44 lbs                   | 6 boxes<br>4 layers                | <b>480 kg</b><br>1056 lbs  |
| JP10          | <b>10 Kg</b><br>22 Lbs   | 36  | 2   | <b>20 kg</b><br>44 lbs   | 6 boxes<br>3 layers                | <b>360 kg</b><br>792 lbs   |
| JP15          | <b>20 Kg</b><br>44 Lbs   | 24  | 1   | <b>20 kg</b><br>44 lbs   | 12 boxes<br>2 layers               | <b>480 kg</b><br>1056 lbs  |

#### PALLET DIMENSIONS

| PALLET TYPE                    | LENGTH (L) | WIDTH (W) |
|--------------------------------|------------|-----------|
| <b>EU</b> (European pallet, no | 120 cm     | 80 cm     |
| consigned)                     | 47,2 in    | 31,5 in   |
| North America (US pallets, no  | 111 cm     | 79 cm     |
| wooden crates). IPP certified  | 43,7 in    | 31,1 in   |
| Asia (wooden crates)           | 112 cm     | 79 cm     |
| IPP certified                  | 44,1 in    | 31,1 in   |

Maximum weight per pallet: 700 kg



#### TECSPOOL®

#### ANTI ROTATION SYSTEM PATENTED BY THERMOCOMPACT



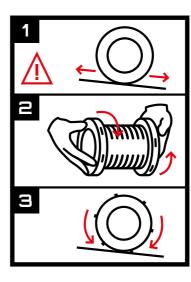
FOR A BETTER **STORAGE** AND **HANDLING** 

AVAILABLE FOR **T125**, **T160** ET **T200** EDM WIRE SPOOLS

ON STANDARD **DIN** SIZES

#### **WAY OF FUNCTIONING**

One manual rotation of the side flange is enough to free the lock bolts of the spool.



#### **TECSPOOL® BENEFITS**

- Spool is stopped in horizontal position
- > Stability guaranteed on incline surface up to 30% slope.
- TecSpool® avoids wire tangles of the outer layer
- **>** Easy storage display
- > Flanges are made with recycled material



#### **SPOOLS STORAGE RECOMMENDATIONS**



HORIZONTALLY, **IN ITS PACKAGING** 



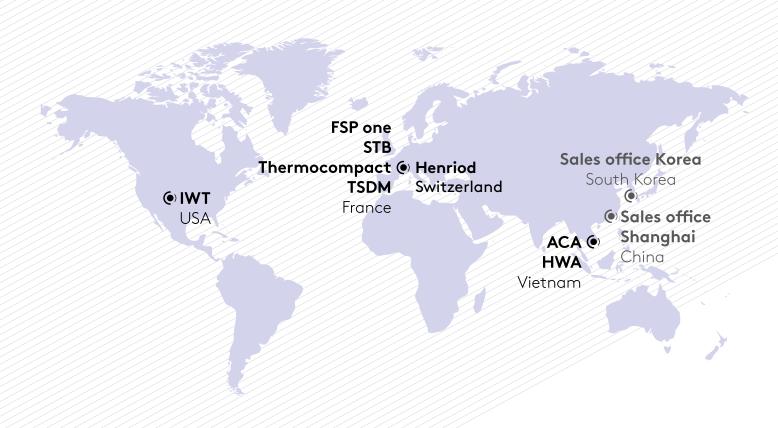
**OPEN THE PACKAGING BEFORE USE** 



**WIRE TO BE USED WITHIN 18 MONTHS** 



#### WHERE TO FIND US



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