

Архангельск (8182)63-90-72  
Астана (7172)727-132  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
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Краснодар (861)203-40-90  
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Курск (4712)77-13-04  
Липецк (4742)52-20-81  
Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
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Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16  
Россия (495)268-04-70

Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13  
Казахстан (772)734-952-31

Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

<https://inficon.nt-rt.ru> || [inb@nt-rt.ru](mailto:inb@nt-rt.ru)

# Каталог тонкопленочных кристаллов



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# About INFICON

## HISTORY

INFICON manufactures a wide range of products for gas analysis, leak detection, vacuum measurement, and thin film deposition. We manufacture highly reliable quartz crystals for our thin film deposition products at our facility in Overland Park, Kansas, USA.

INFICON maintains high standards for quality and we continually provide high quality products to our customers worldwide. The following milestones demonstrate this quality commitment at our crystal manufacturing facility:

- 1994: 100% cleanroom manufacturing process
- 1996: Certification to ISO 9002
- 2003: Certification to ISO 9001:2000
- 2008: Certification to ISO 9001:2008
- 2015: Recertification to ISO 9001:2015
- 2015 Certification to ISO 14001

Vertical integration of crystal manufacturing into the INFICON controller, monitor, sensor, and crystal products allows deposition process optimization. In turn, this enables our customers to produce superior quality products. It also provides additional value with fast delivery, inventory management optimization for users, and maximum process performance with customized solutions.

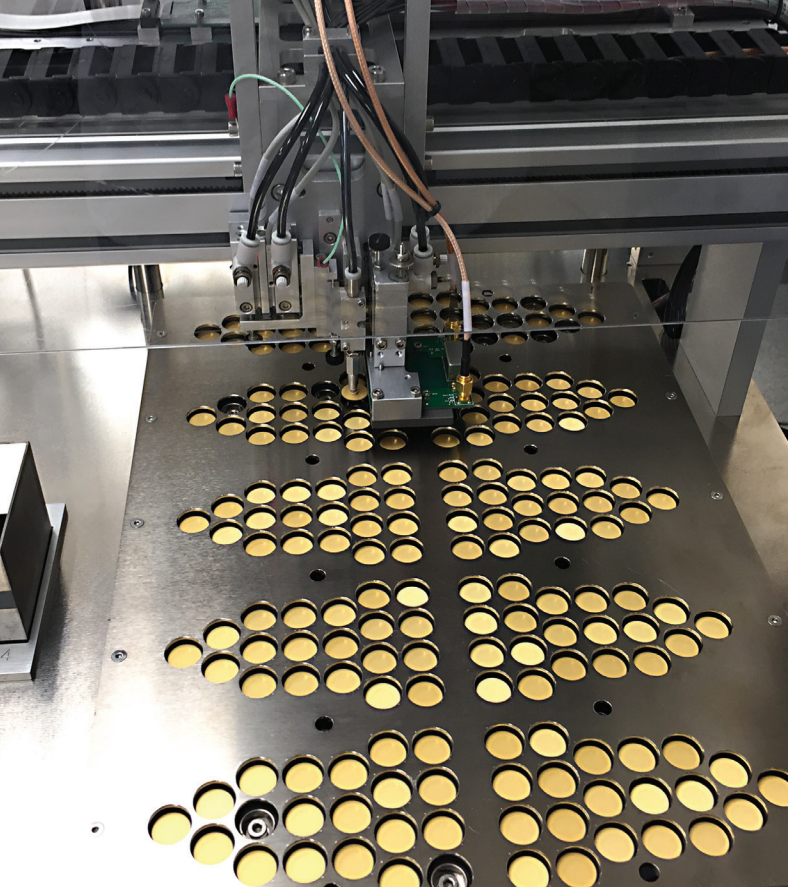
## EFFICIENCY

Our INFICON EDC manufacturing facility is able to produce a multitude of crystal variations in high capacity with an extremely high yield.

Automation is a cornerstone to increasing yield and production. INFICON currently uses automation in crystal processing and is continually upgrading and improving manufacturing equipment to surpass the capacity and yield of previous generations. This leads to effective and efficient crystal production.

INFICON offers vacuum deposition and research crystals in different crystal diameters, frequencies, electrode patterns, electrode coatings, and packaging options to meet the unique needs of each customer. In addition, INFICON also manufactures specialty crystals that are application-specific, such as crystals customized for ALD depositions.





## QUALITY

We manufacture each crystal to the highest standards of quality assurance beginning with the raw quartz and continuing through to the final packaged products ready for shipment. This includes cleanroom manufacturing and testing of each crystal. One hundred percent of the crystals produced undergo a thorough examination to ensure the highest quality and reliability under the following criteria:

- Resistance: checked to assure measurement stability and longer coating life
- Curvature: monitored to assure resonance stability
- Frequency: verified both before and after application of electrodes to ensure accurate thickness measurement
- Visual conformity: inspected for electrode uniformity, surface flaws, and other imperfections which might indicate poor adhesion or contamination

In addition to 100% crystal testing, all crystals are subject to an outgoing audit by the quality assurance department to guarantee that only highly reliable quartz crystals are shipped.

## VALUE

An efficient production process coupled with intensive quality assurance measures allow INFICON to provide superior performance and value. This enables our customers and end users to achieve high quality products through increased thickness accuracy and throughput. With flexible delivery schedules and on-site product inventory, INFICON works with customers to optimize their inventory. INFICON offers worldwide applications support and rapid troubleshooting of process variances to maximize process performance and identify customized solutions. The accomplishments and proven history of INFICON mean customers can rely on a steady and stable supply of this critical consumable.

### **Optimize QCM process efficiency and consumable inventory with the most reliable crystals and flexible delivery.**

- Minimize process interruption and consumable cost: each crystal is tested and inspected to ensure stability and maximum crystal life.
  - Increase profitability and maximize continuous process runs with increased production time.
  - Minimize cost of consumables with the INFICON crystals to ensure maximum crystal life.
- Optimize inventory management: flexible delivery schedules and a stable supply of a critical component from the world leader in thin film solutions.
  - Optimize inventory management with flexible delivery schedules and in stock products.
  - Maximize process performance and gain customized solutions with worldwide applications support.
  - Rapid troubleshooting of process variances with expert support.
  - Guaranteed stable supply by an ISO certified company.



# INFICON Quartz Monitor Crystals

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	008-010-G10
Nominal Frequency	6 MHz
Center Frequency	5.950 MHz
Frequency Tolerance	±0.030 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1000-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-625-G10
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Narrow Starting Frequency, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

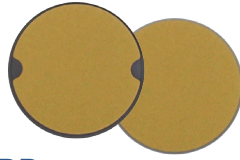
## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1003-G10
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Narrow Starting Frequency, INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1028-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1051-G50
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	50-Pack

## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1054-G50
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	50-pack

## Gold Electrode Crystals

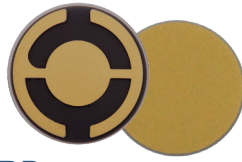


### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1067-G50
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Flip Tray for Select 10-Crystal Sensors



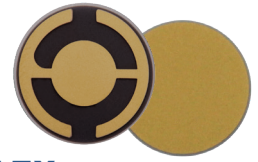
## Gold Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1087-G50
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Flip Tray for 10-Crystal, Type A Sensor

## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	SPC-1157-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Low Thermal Shock, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-625-G6
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, Narrow Starting Frequency
Packaging	Six-Crystal Flip Tray for Select Six-Crystal Sensors

## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1057-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	25°C ±15°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Room Temperature Crystal, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

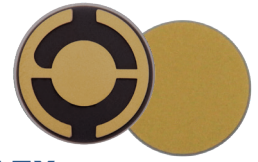
## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1058-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	120°C ±8°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	High-Temperature ALD Crystal, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1059-G10
Nominal Frequency	6 MHz
Center Frequency	5.9875 MHz
Frequency Tolerance	±0.0125 MHz
Wafer Diameter	14 mm
Resistance	<40 Ω
Crystal Cut	IT
Operating Temperature	240°C ±5°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	High-Temperature ALD Crystal, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1060-G10
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	285°C ±4°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	High-Temperature ALD Crystal, INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals

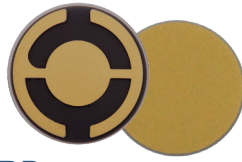


### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1121-G10
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Cleanroom Compatible Carousel



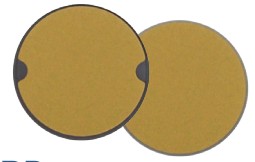
## Gold Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-225-G2
Nominal Frequency	5 MHz
Center Frequency	4.940 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

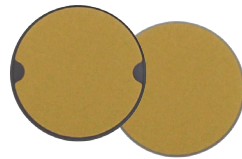
## Gold Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1050-G10
Nominal Frequency	5 MHz
Center Frequency	5.0045 MHz
Frequency Tolerance	±0.0045 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

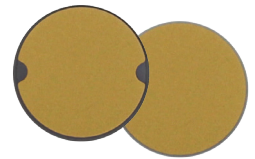
## Gold Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1048-G10
Nominal Frequency	5 MHz
Center Frequency	4.988 MHz
Frequency Tolerance	±0.012 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

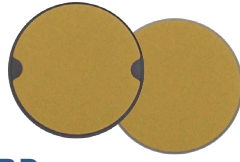
## Gold Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1026-G10
Nominal Frequency	5 MHz
Center Frequency	4.995 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1118-G10
Nominal Frequency	5 MHz
Center Frequency	5.005 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103262
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103264
Nominal Frequency	6 MHz
Center Frequency	5.995 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103711
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Cleanroom Compatible Carousel



## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103220
Nominal Frequency	6 MHz
Center Frequency	5.9855 MHz
Frequency Tolerance	±0.0095 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103209
Nominal Frequency	6 MHz
Center Frequency	5.9855 MHz
Frequency Tolerance	±0.0095 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103702
Nominal Frequency	6 MHz
Center Frequency	5.985 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Black Flat Pack Carousel

## Gold Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103755
Nominal Frequency	6 MHz
Center Frequency	5.983 MHz
Frequency Tolerance	±0.003 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand, Narrow Starting Frequency
Packaging	Six-Crystal Flip Tray for Select Six-Crystal Sensors

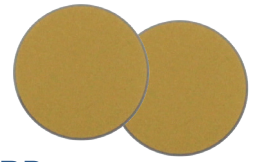
## Gold Electrode Crystals



### MAXTEK 5 MHZ, STANDARD

PART NUMBER	103222
Nominal Frequency	5 MHz
Center Frequency	4.991 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

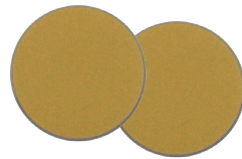
## Gold Electrode Crystals



### MAXTEK 5 MHZ, STANDARD

PART NUMBER	186201
Nominal Frequency	5 MHz
Center Frequency	4.988 MHz
Frequency Tolerance	±0.012 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Full Pad Both Sides
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

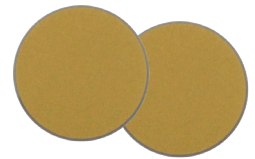
## Gold Electrode Crystals



### MAXTEK 5 MHZ, STANDARD

PART NUMBER	103749
Nominal Frequency	5 MHz
Center Frequency	5.0045 MHz
Frequency Tolerance	±0.0045 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Full Pad Both Sides
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Gold Electrode Crystals



### MAXTEK 5 MHZ, STANDARD

PART NUMBER	186206
Nominal Frequency	5 MHz
Center Frequency	4.988 MHz
Frequency Tolerance	±0.012 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Gold
Electrode Pattern	Full Pad Both Sides
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	Cleanroom Compatible Carousel



## Silver Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	008-009-G10
Nominal Frequency	6 MHz
Center Frequency	5.950 MHz
Frequency Tolerance	±0.030 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Silver
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel

## Silver Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1014-G10
Nominal Frequency	6 MHz
Center Frequency	5.950 MHz
Frequency Tolerance	±0.030 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Silver
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

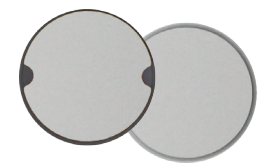
## Silver Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-226-G2
Nominal Frequency	5 MHz
Center Frequency	4.940 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Silver
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel

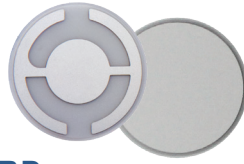
## Silver Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1081-G10
Nominal Frequency	5 MHz
Center Frequency	5.0045 MHz
Frequency Tolerance	±0.0045 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Silver
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel

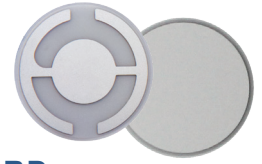
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-679-G1
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel

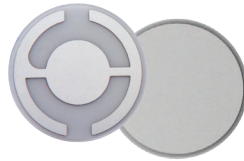
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1022-G10
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel

## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1002-G10
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

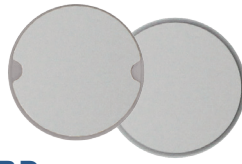
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1015-G10
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Compact Box

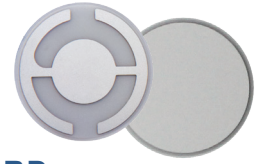
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1023-G10
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

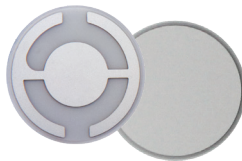
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1053-G50
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	50-Pack

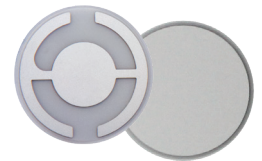
## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1091-G50
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Flip Tray for Select 10-Crystal Sensors

## Alloy Electrode Crystals



### INFICON 6 MHZ, STANDARD

PART NUMBER	750-1088-G50
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Flip Tray for 10-Crystal, Type A Sensor

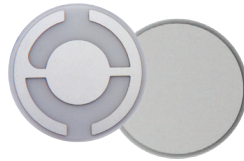
## Alloy Electrode Crystals



### INFICON 6 MHZ, SPECIALTY

PART NUMBER	750-1120-G10
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Cleanroom Compatible Carousel

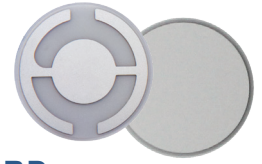
## Alloy Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1007-G10
Nominal Frequency	5 MHz
Center Frequency	4.940 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Black Flat Pack Carousel

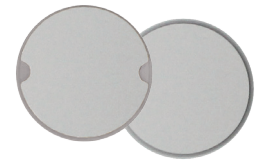
## Alloy Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-678-G1
Nominal Frequency	5 MHz
Center Frequency	4.940 MHz
Frequency Tolerance	±0.010 MHz
Wafer Diameter	14 mm
Resistance	<19.1 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Cleanroom Compatible Carousel

## Alloy Electrode Crystals

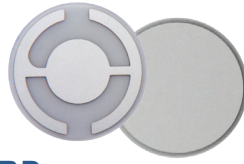


### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1044-G10
Nominal Frequency	5 MHz
Center Frequency	5.0045 MHz
Frequency Tolerance	±0.0045 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	Clean Room Compatible Carousel



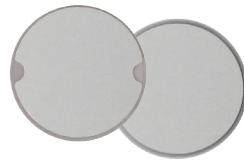
## Alloy Electrode Crystals



### INFICON 5 MHZ, STANDARD

PART NUMBER	750-1065-G50
Nominal Frequency	5 MHz
Center Frequency	5.0045 MHz
Frequency Tolerance	±0.0045 MHz
Wafer Diameter	14 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand Crystal
Packaging	50-Pack

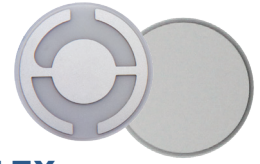
## Alloy Electrode Crystals



### INFICON 5 MHZ, SPECIALTY

PART NUMBER	750-1119-G10
Nominal Frequency	5 MHz
Center Frequency	5.005 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Nib/Full Face
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Cleanroom Compatible Carousel

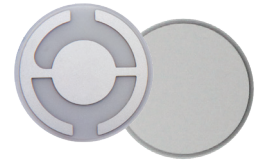
## Alloy Electrode Crystals



### INFICON 5 MHZ, SPECIALTY

PART NUMBER	750-1117-G10
Nominal Frequency	5 MHz
Center Frequency	5.005 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Cleanroom Compatible Carousel

## Alloy Electrode Crystals



### INFICON 5 MHZ, SPECIALTY

PART NUMBER	750-1117-G6
Nominal Frequency	5 MHz
Center Frequency	5.005 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	Six-Crystal Flip Tray for Select Six-Crystal Sensors

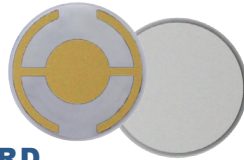
## Alloy Electrode Crystals



### INFICON 4 MHZ, SPECIALTY

PART NUMBER	750-1116-G50
Nominal Frequency	4 MHz
Center Frequency	4.005 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	12.4 mm
Resistance	<20 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	INFICON Brand, High Precision Sensor Crystal
Packaging	50-Pack Flat Pack

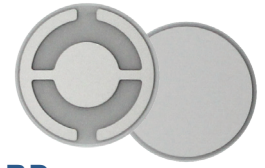
## Alloy Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103240
Nominal Frequency	6 MHz
Center Frequency	5.983 MHz
Frequency Tolerance	±0.007 MHz
Wafer Diameter	14 mm
Resistance	<15 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

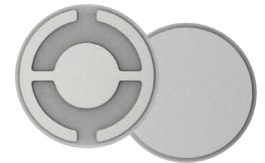
## Alloy Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103259
Nominal Frequency	6 MHz
Center Frequency	5.984 MHz
Frequency Tolerance	±0.009 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Aluminum
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand Crystal
Packaging	White Flat Pack Carousel

## Alloy Electrode Crystals



### MAXTEK 6 MHZ, STANDARD

PART NUMBER	103754
Nominal Frequency	6 MHz
Center Frequency	5.990 MHz
Frequency Tolerance	±0.005 MHz
Wafer Diameter	14 mm
Resistance	<12 Ω
Crystal Cut	AT
Operating Temperature	70°C ±11°C
Electrode Material	Alloy
Electrode Pattern	Double Anchor
Storage Humidity	30 – 50% Relative Humidity
Special Notes	Maxtek Brand, Narrow Starting Frequency
Packaging	Six-Crystal Flip Tray for Select Six-Crystal Sensors

# Crystal Selection Guide

## Starting Frequency

A brand new quartz crystal will not have a frequency of exactly 5 MHz or 6 MHz. It is normal for a new crystal to display a crystal life anywhere from 0 to 5% due to process variations in producing the crystal. If a new crystal indicates 5% life spent, it means that either the quartz blank is slightly thicker than normal (more mechanical robustness), the electrode is slightly thicker than normal (better thermal and electrical properties), or both. This additional thickness causes the starting frequency to be lower than the rated value of 5 MHz or 6 MHz. Despite a lower starting frequency, its overall performance will not be adversely affected. Lower starting frequency crystals have been tested and the results indicate that brand new crystals indicating 3 to 5% life spent are just as good as, if not better than, crystals indicating 0 to 2% life spent.

## Electrode Materials

After choosing crystal size and frequency, choose the electrode material best suited for the application:

- Gold
- Silver
- Alloy

### **GOLD**

Gold is the most widely used electrode material. It performs well in a large variety of applications. Gold provides good adhesion, low rate noise, and good crystal life. Gold crystals have an indefinite shelf life.

### **SILVER**

Silver electrodes have high thermal conductance, enabling them to transfer heat arriving from the hot evaporation source to the water-cooled sensor body to keep the crystal from getting too hot. Silver crystals provide good adhesion for materials used in optical coatings, delivering good crystal life and low rate noise.

Silver tarnishes due to interaction with hydrogen sulfide in air. Because of this, the shelf life of silver crystals is typically limited to six months after opening the package.

**NOTE:** INFICON silver crystals in cleanroom compatible packages, 008-009-G10 and 750-226-G2, are shipped in a heat-sealed external sleeve filled with inert gas to protect against tarnishing during shipment and storage.

## Electrode Material Advantages and Disadvantages

ELECTRODE MATERIAL	ADVANTAGES	DISADVANTAGES
Gold (Standard Type)	<ul style="list-style-type: none"><li>• Does not oxidize</li><li>• Indefinite shelf life</li><li>• Most widely used, good for a large number of applications</li></ul>	<ul style="list-style-type: none"><li>• Crystal life may be shorter than silver or alloy in some applications, including materials used in optical coatings.</li></ul>
Silver (Sputtering Type)	<ul style="list-style-type: none"><li>• Best transfer of heat arriving at crystal to cooled sensor body (high thermal conductance)</li></ul>	<ul style="list-style-type: none"><li>• Shelf life depends on oxidation and exposure to sulfur content in air (tarnishing effect)</li><li>• Not widely used</li></ul>
Alloy (High-Stress Coatings)	<ul style="list-style-type: none"><li>• Longest life (2x) for materials used in optical films or for high stress semiconductor materials</li><li>• Higher activity values compared to gold and silver</li></ul>	<ul style="list-style-type: none"><li>• Alloy electrodes will oxidize, shorter shelf life compared to gold</li><li>• No added benefit when depositing “normal” stress materials (non-high-stress metals)</li></ul>

ELECTRODE PATTERN	ADVANTAGE	DISADVANTAGE
Double Anchor	<ul style="list-style-type: none"> <li>• Traps energy in the center of the crystal</li> <li>• Maximizes crystal stability and life by minimizing opportunity to couple unwanted modes of oscillation</li> </ul>	<ul style="list-style-type: none"> <li>• Crystal can be put into crystal holder upside down</li> </ul>
Single Anchor	<ul style="list-style-type: none"> <li>• Traps energy in the center of the crystal</li> <li>• Maximizes crystal stability and life by minimizing opportunity to couple unwanted mode of oscillation</li> </ul>	<ul style="list-style-type: none"> <li>• Crystal can be put into crystal holder upside down</li> <li>• May not be compatible with all sensor head types (depends on placement of sensor electrical contacts)</li> </ul>
Double Full Face (dual pad, no anchor pattern)	<ul style="list-style-type: none"> <li>• No orientation dependency when placing crystal into holder (crystal cannot be put in upside down)</li> </ul>	<ul style="list-style-type: none"> <li>• Expect shorter life, and coupling of unwanted modes of oscillation (crystal can be noisy earlier in life)</li> </ul>

## ALLOY

An alloy electrode provides excellent adhesion for materials used in optical coatings and also acts to absorb the tensile and compressive stresses common in some films, maximizing crystal life and reducing rate noise.

Activity values tend to be higher for alloy crystals compared to gold crystals. The shelf life of INFICON alloy crystals is typically six months.

## Electrode Patterns

INFICON crystals are available with three different electrode patterns:

- Full Pad/Anchor Pad (double anchor)
- Full Pad/Anchor Pad (single anchor)
- Full Pad Both Sides



Double Anchor

Single Anchor

### FULL PAD/ ANCHOR PAD

Full Pad/Anchor Pad crystals have a full pad electrode pattern on

one side and a single or double anchor electrode pattern on the other side. The double anchor pattern provides a more reliable electrical connection and is recommended. The crystal must be oriented with the fully-coated side facing the deposition source. The anchor electrode pattern focuses the excitation energy into the center area of the crystal to help avoid

unwanted vibrational modes which reduce crystal life and increase rate noise. This design maximizes crystal stability and life by minimizing the opportunity to couple unwanted modes of oscillation.

The excitation area on the anchor electrode pattern side is sized to focus energy at the center of the crystal. This ensures the physical connections made at the perimeter of the crystal have no detrimental effect on its operation.

The Full Pad/Anchor Pad electrode pattern will provide the best performance in crystal life and rate noise and is recommended as standard.

**NOTE:** Full Pad/Anchor Pad crystal must be installed with the fully-coated side facing the deposition source.



### FULL PAD BOTH SIDES

Full Pad Both Sides crystals have a fully-coated electrode on each side. These crystals do not require a specific orientation when installed; it does not matter which side faces the deposition source. Full Pad Both Sides crystals are suitable for high volume production applications where saving time when inserting the crystal into the crystal holder is valuable or where maximum crystal life is not required. The Full Pad Both Sides design results in somewhat shorter crystal life and possible coupling of unwanted modes of oscillation. These unwanted modes can cause rate noise to appear earlier in crystal life.



## Package Choices



### CLEANROOM COMPATIBLE

The Cleanroom Compatible package, containing ten INFICON brand crystals, is safe for cleanroom use.

The package material has a low outgassing rate to avoid contamination. The crystals can be dispensed three ways:

- directly from the package
- using the dispensing tool attached to the package
- with Teflon® tweezers

The crystal touches the package only on its edges, keeping the critical crystal surfaces in pristine condition. The Cleanroom Compatible package requires more shelf space than the Flat Pack Carousel or the Compact Box.



### FLAT PACK CAROUSEL

Ten crystals can be dispensed from the Flat Pack Carousel, either directly or with a vacuum pencil. Flat Pack Carousel packages are easy to store and stack.

This package is slightly thinner and has a lower profile than the Cleanroom Compatible package, therefore the Flat Pack Carousel requires less storage space. INFICON crystals come in a black Flat Pack Carousel package. Maxtek crystals come in a white Flat Pack Carousel package.



The Compact Box package, containing ten INFICON crystals, provides easy storage and consumes the least amount of shelf space. Crystals are dispensed using plastic tweezers or a vacuum pencil. Crystals are separated from each other by inert, low-friction paper, and are cushioned with foam pads.



### BOX OF 5

The Box of 5 package contains five Maxtek crystals in a smaller, clear plastic version of the Compact Box. Each crystal is contained in an inert paper envelope. The crystal is dispensed directly from the envelope with tweezers or with a vacuum pencil.



### 50-PACK

The 50-Pack package contains fifty INFICON crystals in a clear rectangular plastic package. This package

is convenient for high volume production. The 50-Pack package is easy to store and stack. Crystals are dispensed using a vacuum pencil.



### FLIP TRAY

The Flip Tray package, consisting of five trays of 10 crystals each, provides fast and efficient crystal exchange for select 10-crystal rotary sensors, including the

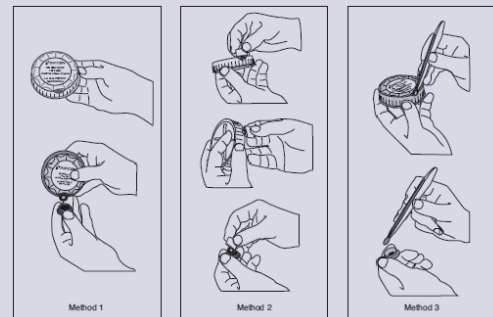
INFICON 10-crystal Type A Sensor. Simply align the 10-crystal carousel with the flip tray and flip both the tray of crystals and the attached carousel for all ten crystals to be exchanged at once without ever handling the crystals.



### SIX-CRYSTAL FLIP TRAY

INFICON six-crystal Flip Tray is compatible with select 6-crystal sensors. The new INFICON quartz crystal package enables quick and convenient crystal transfer

directly from the package to the sensor, minimizing operator handling and risk of contamination.



## Three Easy Options for Dispensing Crystals From the Package:

1. Tilt the package and the crystal drops directly from the package into the crystal holder of the sensor.
2. Use the specially designed tool that comes attached to the base of the package as a carrier to conveniently place the crystal into the holder of the sensor.
3. Use Teflon tweezers to remove the crystal from the package and place into the crystal holder of the sensor.

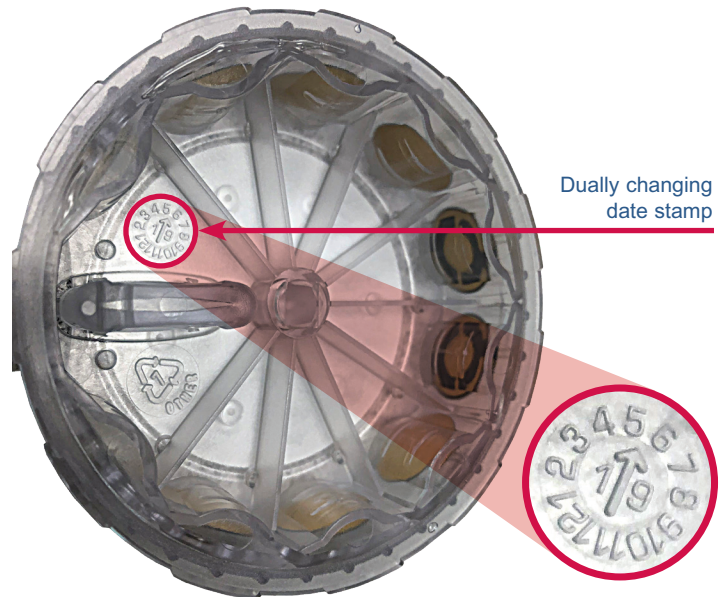
# How to Identify Authentic INFICON Crystal Packaging

INFICON has made changes to the packaging design of the cleanroom compatible crystal carousels and the flat packs for both INFICON and Maxtek® brands.

## CLEANROOM COMPATIBLE

The new cleanroom compatible crystal package adds a dually changing date stamp to the underside of the package to quickly identify authentic INFICON crystals and packaging, minimizing confusion and combatting against counterfeiting or cloning of the cleanroom compatible crystal packages.

The date stamp features an arrow that points to the month of package manufacture as well as a two-digit year. This arrow will change locations four to six times per year and will be a quick indication of our packaging as compared to the counterfeit packaging existent in the market.



## Identifying Subtle Differences Between INFICON Packaging and Counterfeit Packaging

The red arrows (below) point out that the counterfeit package circles around the edges are more predominant on the outside and inside of the counterfeit package lids.



Font differences on the INFICON label can also be easily identified. The part number and frequency on an authentic INFICON cleanroom compatible carousel label is bold in font, as compared to the standard font for the description and lot code. In most of the counterfeit packaging seen to date, the part number and frequency has been printed in the same text as the description and lot code.

Regarding the underside of the cleanroom compatible package (right, top), it can be seen that there is a font difference on the recycle symbol as well as a slight molding difference with the crystal grabber. Additionally, the authentic INFICON package has a cloudier appearance than the counterfeit.



INFICON



Counterfeit



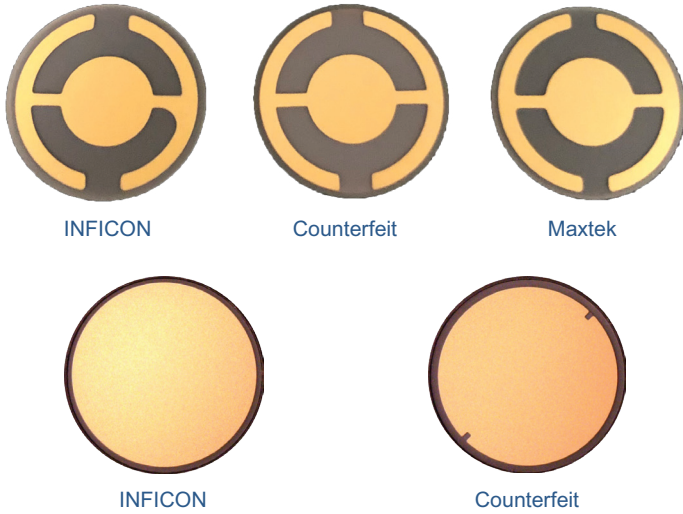
INFICON



Counterfeit

Maxtek brand crystals in a cleanroom compatible package have also been discovered to be counterfeit. These crystals can best be identified by the font on the label (above). The printing on the INFICON label is darker and more granulated in nature.





**CRYSTAL**

Additionally, the crystals within the package were able to be identified as counterfeit.

The counterfeit product contained a pattern as shown in the middle picture (above) and is not an INFICON or Maxtek pattern. The INFICON pattern has one side of the electrode widened and curved for identification.

**FLAT PACK CAROUSEL**

INFICON has improved the packaging design on the flat pack carousels for crystals for both INFICON and Maxtek® brands. The new INFICON quartz crystal package allows for easily identifiable features that are not present on counterfeit packaging.

The improvements that have been made include having a rotatable opening on a dual, the addition of tweezer,

and improved durability in the packaging. Additionally, the base is ergonomically shaped, and the new package is antistatic.

INFICON flat pack carousels are black in color. Maxtek flat pack carousels are white in color.

Maxtek crystals now have a registered trademark (®) on the label and are not bold in font.

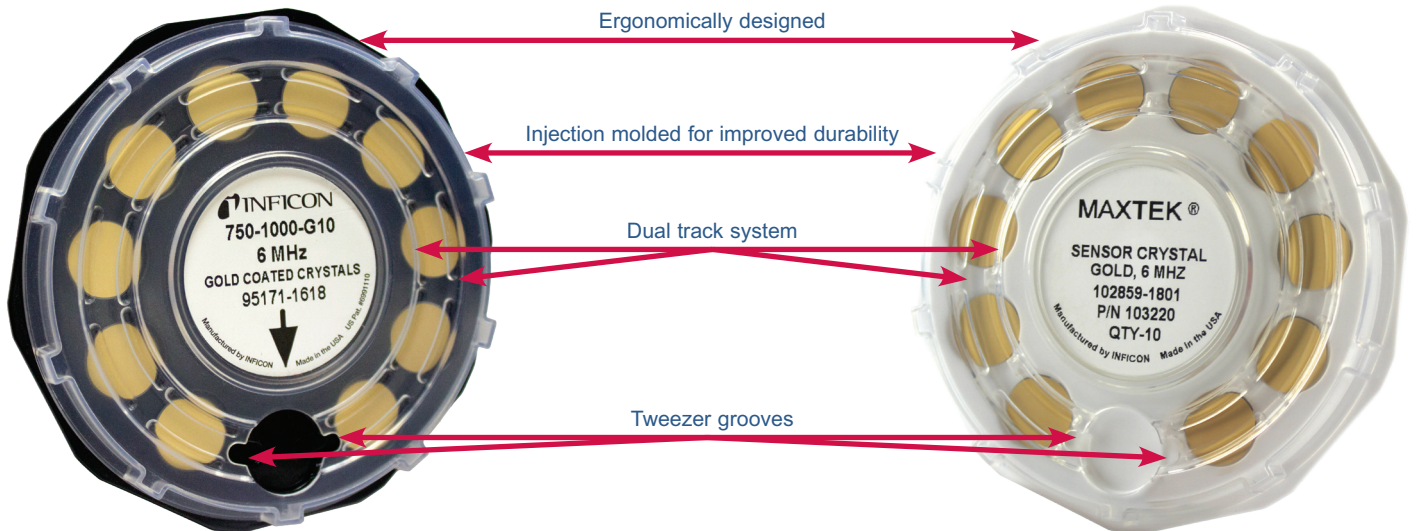
The counterfeit crystals are printed with either a trademark symbol (™) or without and have date codes that can be five to ten years old.

Additionally, they have been seen packaged in either black or white, single-track, round packaging and not the currently available dual-track, 10-sided package with tweezer grooves.

If the authenticity of your purchased INFICON crystals is in question, please contact your local INFICON office for support.



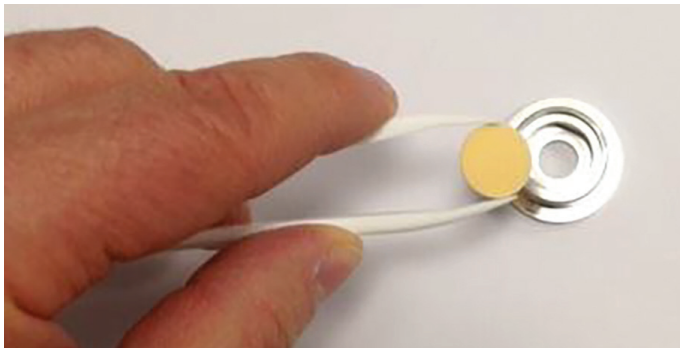
Counterfeits



# Tips for Achieving Long Crystal Life and High Measurement Quality

- Select the best crystal type for the application
- Handle the crystal carefully
- Perform regular sensor maintenance

**Support Worldwide.** Select region, **Technical Support** and **Thin Film Deposition.**



Full Pad Both Sides Crystal shown

## CRYSTAL HANDLING

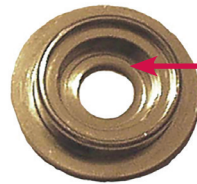
Any contamination of the crystal or scratches in its surface will reduce crystal life and cause rate noise. Contamination and scratches interfere with adhesion of the film deposited on the crystal.

To avoid crystal contamination:

- insert the crystal directly from its package into the crystal holder
- never handle the crystal with bare or gloved fingers
- never drop or place the crystal onto a work bench

Only touch the crystal at the perimeter, never in the center region. Use plastic tweezers to avoid scratching the crystal.

When using a vacuum pencil, the suction surface touching the crystal must be clean. When not in use, store the vacuum pencil so its tip does not touch other surfaces. Regularly clean or replace the suction tip.



Polished surface (crystal contact surface)

## CRYSTAL HOLDER MAINTENANCE

The crystal holder makes an electrical and thermal connection to the crystal at its perimeter.

For INFICON sensors, the crystal holder contact surface is highly polished. This provides an excellent electrical connection to the front electrode on the crystal and maximizes the surface area conducting the heat arriving at the crystal to the water-cooled sensor body.

However, coating material will eventually build up on the crystal holder contact surface. This buildup reduces electrical and thermal conductance, causing increased rate noise and reducing crystal life.

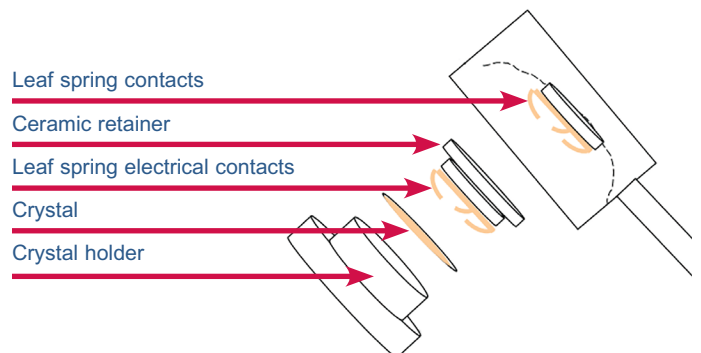
When cleaning, avoid scratching the surface, to retain a highly polished contact.

Material buildup on the holder must be removed regularly to maintain the constant size of the center opening run-to-run.

Material buildup on the holder must not touch the crystal surface.

## CONTACT LEAF MAINTENANCE

All sensors have contact leaves that make an electrical connection to the rear electrode on the crystal. These contact leaves must be inspected regularly and replaced or adjusted. Refer to the sensor manual for information regarding replacing or adjusting the contact leaves.





# Applications



## Optical Coatings

### STANDARD OPTICAL COATINGS

Standard Optical Coatings typically have fewer than eight layers controlled by the crystal. They include ophthalmic and simple camera lenses as well as basic anti-reflective display coatings. This application typically uses Gold crystals.

### PRECISION OPTICAL COATINGS

Precision optical coating applications typically require multi-layer stacks of dielectric materials.

The applications include bandpass optical filters with a sharp cutoff for dense wave division multiplexing and

other fiber-communication applications, high-quality, anti-reflectance optics for cameras, telescopes, rifle scopes, microscopes, medical instruments, binoculars, night vision optics devices and semiconductor photolithography.

Dielectric materials include aluminum oxide ( $\text{Al}_2\text{O}_3$ ), calcium fluoride ( $\text{CaF}_2$ ), magnesium fluoride ( $\text{MgF}_2$ ), tantalum pentoxide ( $\text{Ta}_2\text{O}_5$ ), titanium dioxide ( $\text{TiO}_2$ ), thorium fluoride ( $\text{ThF}_4$ ), silicon monoxide ( $\text{SiO}$ ), silicon dioxide ( $\text{SiO}_2$ ), zirconium dioxide ( $\text{ZrO}_2$ ), and many more. These materials cause a higher level of stress to the crystal and an Alloy crystal is recommended.

For some applications, when the source or sensor shutter opens, there is a large increase in the amount of heat arriving at the crystal, resulting in a sudden jump in crystal temperature and film stress. Both of which cause a spike in rate and thickness. For these applications, Low Thermal Shock Gold crystals are recommended.

### VERY THIN OPTICAL COATINGS UNDER 50 NM THICK

These applications are susceptible to an initial rate and thickness spike when the shutter is opened, due to the large increase in heat arriving at the crystal. This spike may cause incorrect thickness termination and possible control loop instability. Low Thermal Shock Gold crystals are recommended.

NOTE: Low Thermal Shock Gold crystals are designed to reduce the rate and thickness spike induced by the thermal shock created when the source or sensor shutter opens.



## Metal Coatings

### HIGH HEAT LOAD APPLICATIONS

High heat load is often present in diode sputtering from large sources when evaporating very high melting point materials such as molybdenum (Mo), tantalum (Ta), and tungsten (W), or when the substrates are heated above 300°C.

Crystals for these applications must have high thermal conductance to transfer heat, arriving from the hot evaporation source, to the water-cooled sensor body which maintains crystal temperature.

For long crystal life and low rate noise, crystals used in high heat load applications must have good adhesion for the materials used in optical coatings. INFICON Silver crystals (known as Sputtering Type) are well-suited for this application.

NOTE: High heat load applications refer to those applications, such as sputtering, that use water to cool the crystal. For ALD applications, High Temperature crystals are recommended, see Applications – ALD.

### LOW STRESS COATINGS SUCH AS ALUMINUM, GOLD AND SILVER

Low stress coatings are often used for electrical contacts and in “Cold Mirrors” to reflect the heat and light from light sources used in projection equipment and other

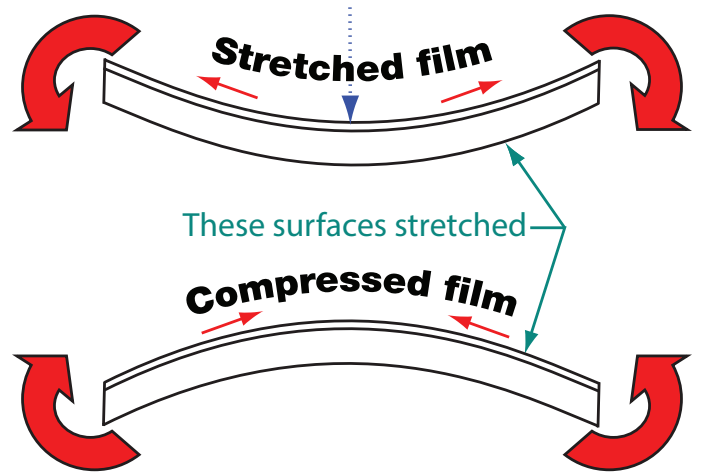


Illustration provided by Felix Lu, Applied Quantum Technologies / Duke University

lighting applications, such as store display lighting systems, automotive lights, flashlight reflectors and LEDs. These applications typically use Gold crystals.

### HIGH STRESS MATERIAL COATING

High stress materials include those used in semiconductor processes: chromium (Cr), germanium (Ge), molybdenum (Mo), nichrome, nickel (Ni), tantalum (Ta), titanium (Ti), silicon oxycarbide (SiOC), zirconium (Zr), as well as the dielectric materials listed above under Precision Optical Coatings. For these applications, Alloy crystals usually perform the best. However, Silver crystals are also suitable.







## OLED

OLED materials have a granular amorphous structure which does not bond firmly to the crystal electrode. This structure dissipates motional energy, which results in short crystal life. Low Thermal Shock Gold crystals are recommended.

Some OLED materials are deposited at extremely low rates. Maximizing rate stability and minimizing rate noise are

very important. Alloy crystals will provide the best rate stability and minimum noise.

## ALD

ALD uses two precursors that react to deposit material (metals or metal oxides) one atomic monolayer at a time. Most ALD reactions are temperature dependent, and the crystal must remain at the reaction temperature.

Water cooling cannot be used during an ALD process to cool the crystal and maintain the optimal temperature for standard INFICON crystals. High Temperature ALD crystals are recommended for ALD applications for this reason.

High Temperature crystals are 6 MHz, gold-coated crystals that are optimized at 120, 240, or 285°C. These crystals have a smaller range of temperatures that deliver stable and accurate thickness readings. See Figure 1.

NOTE: Crystals optimized to additional temperatures are available upon request. Please contact INFICON for custom crystals.

The graph represents the temperature change from the optimal crystal temperature and the resulting frequency error due to temperature.

NOTE: The optimization temperatures of the High Temperature crystals (120, 240, or 285°C) as well as standard INFICON crystals (70°C) have been normalized to zero to be able to compare the temperature range of all offerings on one graph.

- 70°C crystals display a stable frequency operating in a temperature range of 59 to 81°C.
- 120°C crystals display a stable frequency operating in a temperature range of 112 to 128°C.
- 240°C crystals display a stable frequency operating in a temperature range of 235 to 245°C.
- 285°C crystals display a stable frequency operating in a temperature range of 281 to 289°C.

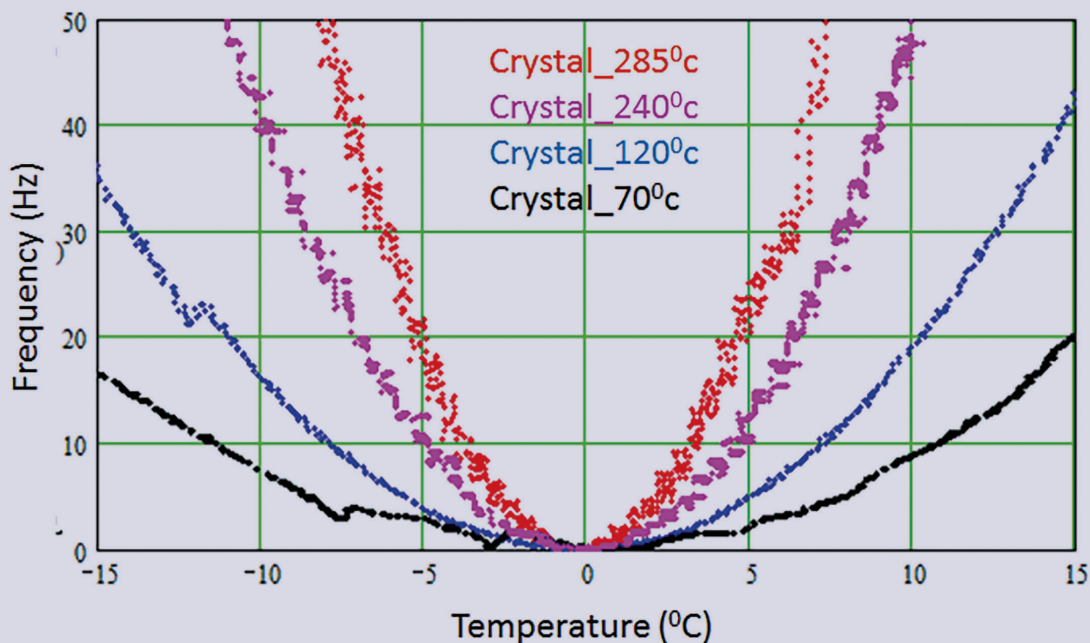


Figure 1: High temperature crystal frequency error

Архангельск (8182)63-90-72  
Астана (7172)727-132  
Астрахань (8512)99-46-04  
Барнаул (3852)73-04-60  
Белгород (4722)40-23-64  
Брянск (4832)59-03-52  
Владивосток (423)249-28-31  
Волгоград (844)278-03-48  
Вологда (8172)26-41-59  
Воронеж (473)204-51-73  
Екатеринбург (343)384-55-89  
Иваново (4932)77-34-06

Ижевск (3412)26-03-58  
Иркутск (395)279-98-46  
Казань (843)206-01-48  
Калининград (4012)72-03-81  
Калуга (4842)92-23-67  
Кемерово (3842)65-04-62  
Киров (8332)68-02-04  
Краснодар (861)203-40-90  
Красноярск (391)204-63-61  
Курск (4712)77-13-04  
Липецк (4742)52-20-81

Киргизия (996)312-96-26-47

Магнитогорск (3519)55-03-13  
Москва (495)268-04-70  
Мурманск (8152)59-64-93  
Набережные Челны (8552)20-53-41  
Нижний Новгород (831)429-08-12  
Новокузнецк (3843)20-46-81  
Новосибирск (383)227-86-73  
Омск (3812)21-46-40  
Орел (4862)44-53-42  
Оренбург (3532)37-68-04  
Пенза (8412)22-31-16

Россия (495)268-04-70

Пермь (342)205-81-47  
Ростов-на-Дону (863)308-18-15  
Рязань (4912)46-61-64  
Самара (846)206-03-16  
Санкт-Петербург (812)309-46-40  
Саратов (845)249-38-78  
Севастополь (8692)22-31-93  
Симферополь (3652)67-13-56  
Смоленск (4812)29-41-54  
Сочи (862)225-72-31  
Ставрополь (8652)20-65-13

Казахстан (772)734-952-31

Сургут (3462)77-98-35  
Тверь (4822)63-31-35  
Томск (3822)98-41-53  
Тула (4872)74-02-29  
Тюмень (3452)66-21-18  
Ульяновск (8422)24-23-59  
Уфа (347)229-48-12  
Хабаровск (4212)92-98-04  
Челябинск (351)202-03-61  
Череповец (8202)49-02-64  
Ярославль (4852)69-52-93

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