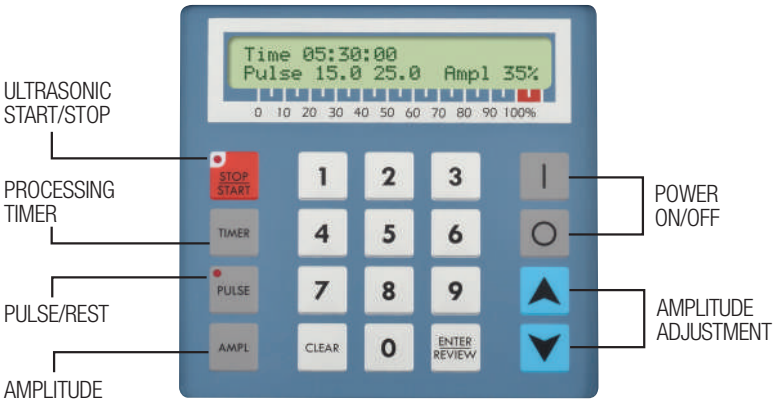
QSONICA Q500 Sonicator

The Q500 is a powerful ultrasonic processor featuring programmable operation and a digital display of operating parameters. Popular applications include nanoparticle dispersion, creating emulsions, cell lysis and homogenization.

Adjustable pulse On and Off times can be programmed from 1 second to 1 minute. Total programming has a maximum setting of 10 hours. A wide variety of probes and accessories are available to handle virtually any application.

Stand sold separately.



FEATURES:

Programmable operation
Set time and amplitude for hands free operation

Pulse mode
Prevent heat buildup in temperature sensitive samples

Digital amplitude / intensity control
Output intensity can be set from 20-100%

Elapsed time indicator
Displays duration of sonication

Display of wattage and joules
Real-time energy monitoring

Overload protection
Prevents damage to circuitry if a fault occurs

RoHS compliant
Uses lead free components

PART NO. Q500 INCLUDES:

- Generator
- Converter
- 1/2″ diameter probe
- Power cable
- Converter cable
- Wrench set

TECHNICAL SPECIFICATIONS:

Power Rating:	500 watts
Frequency:	20 kHz
Programmable Timer:	10 hours
Adjustable Pulse On/Off:	1 second to 1 minute
Dimensions:	8″ W x 15.25″ L x 8.5″ H
Voltage:	110V, 50/60Hz

Specify desired voltage for export.

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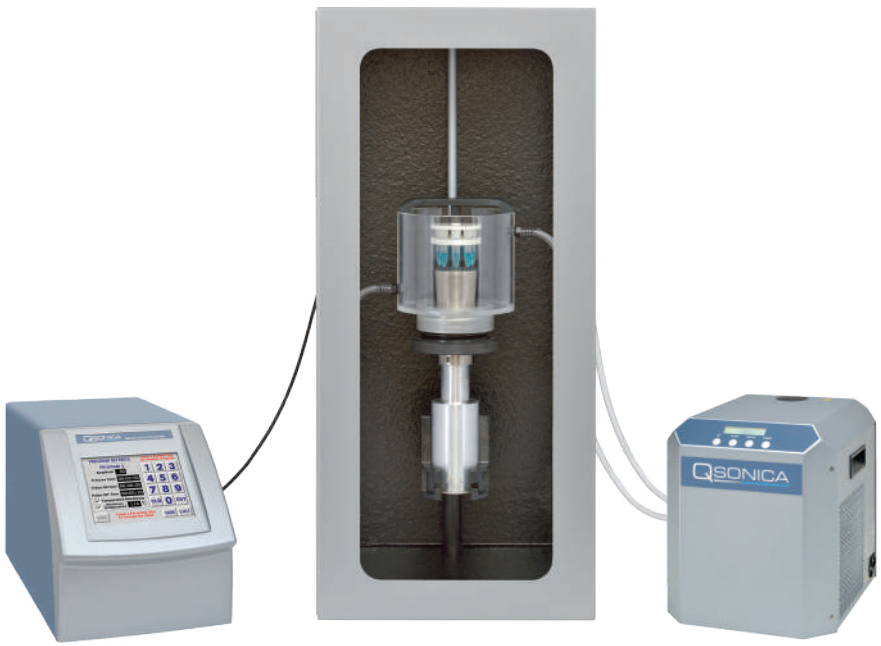
Cup Horn

A Cup Horn offers indirect sonication and functions as a high intensity ultrasonic water bath. Multiple samples can be processed in sealed tubes eliminating cross contamination or aerosol issues.

The horn is mounted within an acrylic cup and the cup is filled with water. Sample tubes are placed in a rack at a fixed distance above the ultrasonic horn. Cavitation is produced in the water, processing the samples within the tubes. The #440 tube rack is included with the Cup Horn. This rack is made for 1.5mL polystyrene tubes which are proven to process samples more efficiently than 1.5mL polypropylene tubes.

Sonication generates heat so ports for cooling are located on each side of the cup. The #4905 Chiller is recommended for maintaining both the water temperature and water level within the Cup Horn.

The Sound Enclosure is highly recommended for all Cup Horn users. In addition to reducing sonication noise to safe levels, it securely holds the Cup Horn in place. Custom tube racks are available. Contact Qsonica for application assistance.



#431C2

Optional Tube Racks

#440

#451

#449

#445

#455

#454

Part #	Tube Holder Description
440	8 x 1.5mL Polystyrene tubes
451	8 x 1.5mL Polypropylene tubes
449	12 x 600µl PCR tubes
445	24 x 300µl PCR tubes
455	1 x 50mL tube
454	1 x 15mL tube

Low Volume Flocells

The Low Volume Flocell (LVF) is available for use with either the Q500 or Q700 system. The Flocell (#4650) is equipped with ¼" (6 mm) hose barb fittings and does not include a probe. A ½" (12 mm) replaceable tip probe (#4643) or ½" (13 mm) solid probe (#4644) must be ordered separately. These probes feature a flange for proper mounting with the LVF. The replaceable tip probe is for use with aqueous samples only. Solid tip probes can be used with all types of solvents or low surface tension liquids.

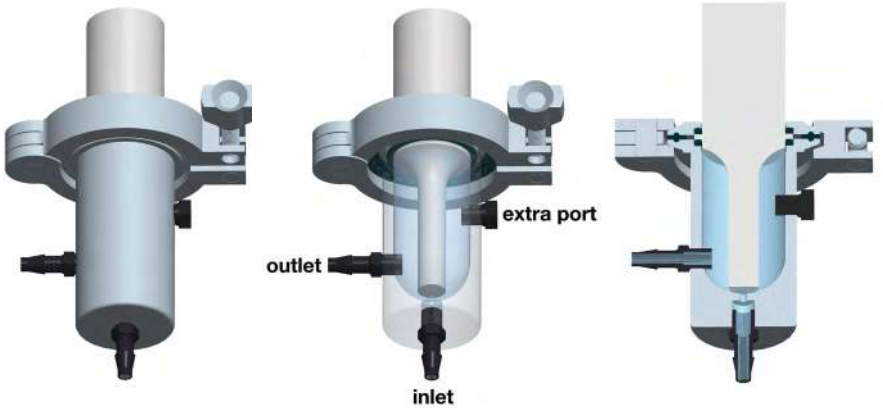
Sonication generates heat so a Water Jacket (#4655) is available if the process requires cooling. The water jacket slides over the LVF and is used to recirculate cold water around the exterior of the flocell body. The water jacket includes ¼" (6 mm) hose barb fittings.

The LVF is recommended for processing sample volumes above 1L. Routine applications include cell lysis, mixing, solubilizing and deagglomerating/ dispersing nanoparticles.

LVF Assembly with Probe

Flocell Assembly with Water Jacket

Probe



Part #	Description
4650	**Low Volume Flocell** • Material: 316L Stainless Steel • Operating pressure: 40-100 psi max. • Internal volume: 65ml • Maximum flow rate: 0.5L/min • Hose barb fittings for ¼" (6 mm) ID tubing • Dimensions (H x D): 9.1 x 3.5 in. 228 x 89 mm) — dimensions include probe and clamp
4643	**½" (13 mm) Replaceable tip probe with flange for #4650**
4644	**½" (13 mm) Solid tip probe with flange for #4650**
4655	**Water Jacket for #4650**

How Flocells Work

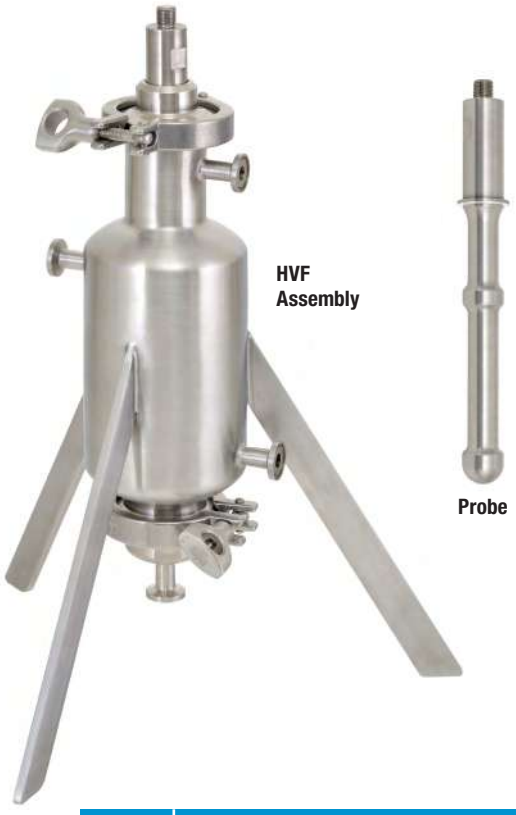
Flocells offer inline or continuous, large volume, batch sample processing. Flocells are ideal for mixing and dispersing applications. Batch volumes can be re-circulated through the system multiple times if increased sonication time is needed. Multiple units can be used in series to reduce processing time and/or maintain an even higher flow rate.

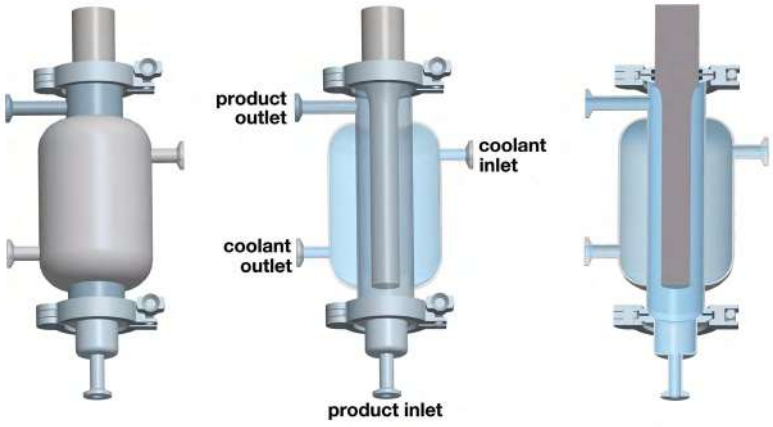
The liquid sample is pumped into the Flocell through the inlet at the bottom of the unit. As the sample passes through the cavitation field, it is processed. The processed liquid exits the unit through an outlet port. The degree of processing can be controlled by adjusting the intensity of sonication as well as flow rate.

High Volume Flocells

The High Volume Flocell (HVF) is available for use with either the Q700 or Q1375 System. The Flocell (#4549) is equipped with ½" (13 mm) sanitary connections, a water jacket and 1" (25 mm) Diameter probe (#4625). The water jacket can be used to recirculate cold water around the exterior of the flocell body. This helps reduce the heat generated during ultrasonic processing.

The HVF is recommended for processing batch volumes of 5L or more. Routine applications include cell lysis, mixing, solubilizing and deagglomerating/ dispersing nanoparticles.





Part #	Description
4549	**High Volume Flocell** • Dimensions (H x D): 17 x 16 in. (431 x 406 mm) • Includes #4625 Probe • Material: 316L Stainless Steel • Operating pressure: up to 100psi • ½" (13 mm) Sanitary connections • Internal volume: 400ml • Maximum flow rate: 20L/min • Water jacketed for cooling
4625	**1"(25 mm) Diameter Flocell Probe**

#432B2
(Probe sold separately.)

Sound Enclosure

Sonicators are extremely loud devices and will cause discomfort to the user and anyone nearby. The Sound Enclosure reduces noise by approximately 20 dBa and is made to work with all accessories (excluding the Microplate Horn which has its own dedicated enclosure).

In addition to reducing noise, the Sound Enclosure has an internal support rod and converter mounting system. Any Qsonica probe or horn will be held safely and securely inside the unit.

Two ports are located on either side of the enclosure for coolant tubing or a temperature monitoring probe. The interior walls are lined with acoustical foam and the door has a window so experiments can be visually monitored.

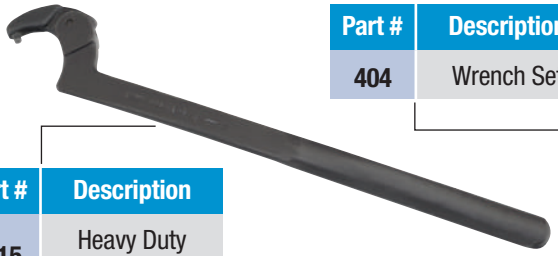
#432B2
(Cup horn sold separately.)

Part #	Description
432B2	Sound Enclosure with Converter Holder, Exterior Dimensions (W x H x D) 13.5 x 30.5 x 13 in. (343 x 775 x 330 mm)

Replacement Converter

Part #	Description
CL334	Replacement Converter

Replacement Wrenches



Part #	Description
404	Wrench Set

Part #	Description
4015	Heavy Duty Pin Spanner

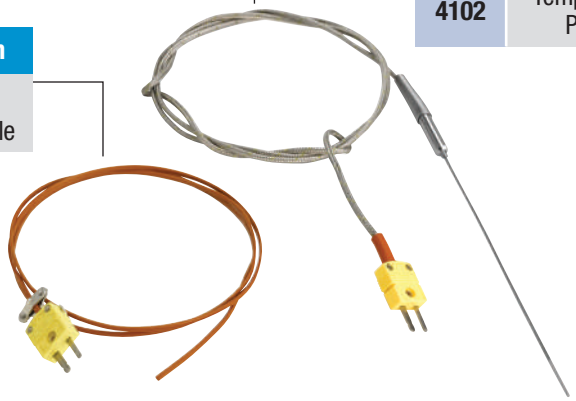
Temperature Monitoring Options

(Q700 only)

Part #	Description
4102	Temperature Probe

Part #	Description
4103	Flexible Thermocouple

2 types of temperature probes are available for use with the Q700 Sonicator



Replacement Converter Cable

Part #	Description
K4	6 ft. Long
K4-10	10 ft. Long

Footswitch

Enables hands free operation

Part #	Description
FS-3	For Use with Q700
4004	For Use with Q500

Heavy Duty Stand

Part #	Description
4130	Heavy Duty Stand

The stand securely holds horns in place and ensures all tips are level. An adjustable jack stand to raise and lower samples is included

Large Clamp Stand

Part #	Description
459	Stand with ½" Diameter Support Rod and Converter Clamp

Jack Stand

Raises and lowers sample vessels to a stationary probe as needed.

Part #	Description
357	Jack Stand

4 Tip Horns

The 4 Tip Horn enables 4 samples to be processed simultaneously. This horn is effective for cell disruption, mixing, homogenization and many other applications. This horn is available with either 1/8" or 1/4" tip diameters.

#4659 is a 4 Tip Horn with 1/8" tips. It is recommended for 1-15ml volumes and fits into both 1.5ml and 15ml tubes. The space between each tip is 1.05". The #504 and #510 Coolracks are compatible with #4659.

#4674 is a 4 Tip Horn with 1/4" tips. It is recommended for 10-50ml volumes and is used with 15 and 50ml tubes. The space between each tip is 1.6". The #511 Coolrack is compatible with the #4674.

#4659 **#4674**

The #4130 Stand with Lab Jack is recommended for use with all high throughput horns. This stand holds the horn stable and level to ensure consistent results.

24 Tip Horn

The 24 Tip Horn processes each well of a 24 well plate at the same time. This horn is effective for cell disruption, mixing, dissolution and many other applications. The distance between each tip is .708".

#4597

Dual Horn

The Dual Horn allows a single Sonicator unit to process two samples simultaneously. Two standard probes are attached to a rectangular shaped horn. The distance from center to center of each probe is 4.5". 3/4" solid tip probes are included with the Dual Horn but 1/2" or 1" probes can also be substituted.

#4525

Microplate Horn

(Only for use with Q700)

Similar to a Cup Horn, but larger, the Microplate Horn is an indirect sonication device capable of processing an entire 96 well microtiter plate or many microtubes at one time.

Simply place your samples within the water-filled reservoir and the sonic energy is transferred into each individual well or tube.

#Q700MPX
(with Chillerand tubing set)

The Horn is equipped with a clear acrylic collar to contain the liquid media within the reservoir. This allows the user to process deep well microplates or other tall vessels. Standard microtiter plates or PCR tubes require a smaller volume of liquid for sonication. For these applications, the clear acrylic collar may be removed and the lower, gray collar will allow for easier access to the samples.

#431MPX

#431MPXH

Part #	Description
Q700MPX	Q700 (Without Standard Probe), and the 431MPX
431MPX	Microplate Horn, Pinch Clamps, Tubing and Sound Enclosure
431MPXH	Microplate Horn Only
432MP	Sound Enclosure for Microplate Horn
444	300µl Microcentrifuge Tube Holder/Cover

Exterior dimensions of the Sound Enclosure are (W x D x H): 10 x 10 x 17 in. (254 x 245 x 432 mm).

#444

The Microplate Horn is commonly used in PMCA research. A microcentrifuge tube holder and cover (#444) are available and often used for this application.

Horns (also known as probes) are made from titanium and machined to specific sizes and shapes. When driven at their resonant frequency, they expand and contract longitudinally. This mechanical vibration is amplified and transmitted down the length of the probe. In liquid, the probe causes cavitation which constitutes the main mechanism for sample processing.

Choosing the appropriate horn is extremely important. The sample volume to be processed is directly related to the tip diameter. Smaller tip diameters (Microtip probes) deliver high intensity sonication, but the energy is focused within a small, concentrated area. Larger tip diameters can process larger volumes, but offer lower intensity. Probes are offered with replaceable, solid or sapphire tips.

Probe tips will pit or erode over time and require replacement. Replaceable tip probes are used with aqueous samples only. In addition to aqueous samples, Solid probes can be used with organic solvents, alcohols and low surface tension liquids. Contact Qsonica with questions regarding proper tip selection.

Standard Probes

Replacable Solid

Part #	Type of Tip	Processing Volume	Tip Diameter	Amplitude (microns)
4220	Replaceable Tip	20-250 ml	1/2" (13 mm)	120 µm
4219	Solid Tip	20-250 ml	1/2" (13 mm)	120 µm
4207	Replaceable Tip	50-500 ml	3/4" (19 mm)	60 µm
4208	Solid Tip	50-500 ml	3/4" (19 mm)	60 µm
4210	Replaceable Tip	100-1,000 ml	1" (25 mm)	30 µm
4209	Solid Tip	100-1,000 ml	1" (25 mm)	30 µm

Replacement Tips for Standard Probes

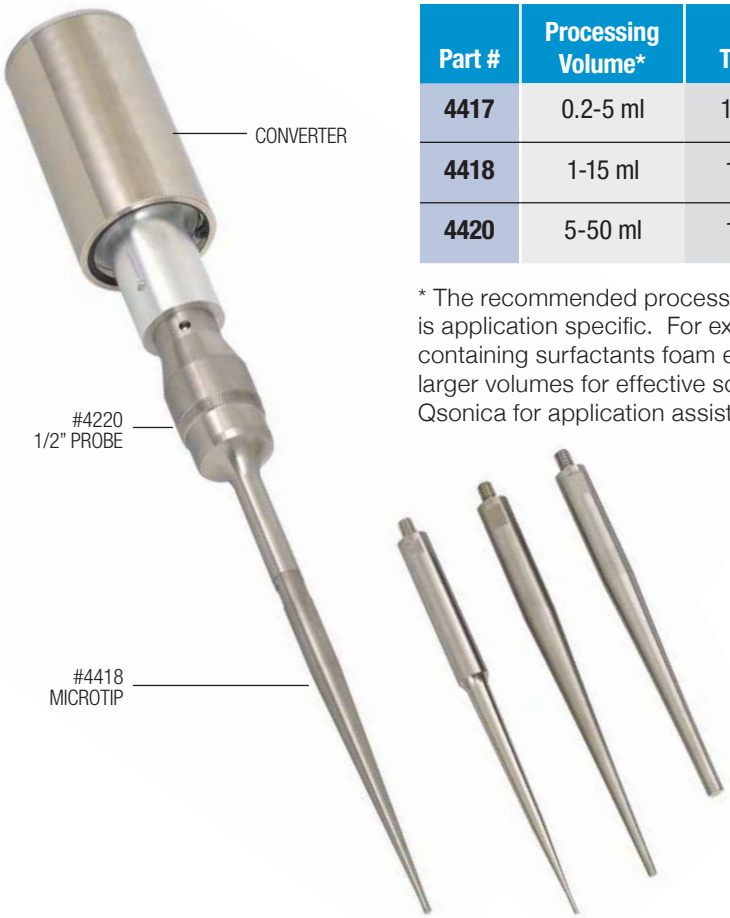
Standard ½", ¾" and 1" horns have replaceable tips. During normal use, tips erode and become less effective over time. These worn tips can be easily removed and replaced.

Part #	Tip Diameter	For Use With
4406	1/2" (13 mm)	#4220
4407	3/4" (19 mm)	#4207
4408	1" (25 mm)	#4210

New Tip Worn Tip

Microtip Probes

Microtips are thin, high intensity probes which are designed for processing small sample volumes. Microtips screw into the threaded end of the standard ½" probe (#4220).

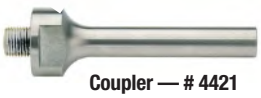


Part #	Processing Volume*	Tip Diameter	Amplitude (microns)
4417	0.2-5 ml	1/16" (2 mm)	320 µm
4418	1-15 ml	1/8" (3 mm)	380 µm
4420	5-50 ml	1/4" (6 mm)	200 µm

* The recommended processing volume range is application specific. For example, samples containing surfactants foam easily and may require larger volumes for effective sonication. Contact Qsonica for application assistance.

Coupler with Stepped Microtip

The stepped microtip and coupler assembly is a low intensity option which can be used to process small volumes that do not require high power. The probe tip remains 1/8" in diameter for 48mm. This 2-piece assembly attaches directly to the converter.



Coupler — # 4421

Stepped Microtip — Part # 4422

Part #	Processing Volume	Tip Diameter	Amplitude (microns)
4422*	0.5-15 ml	1/8" (3 mm)	200 µm
4421	Coupler - *required for use of a Stepped Microtip		

Extenders

Standard probes may not be long enough to fit down into certain long necked vessels. Extender probes attach to standard horns of the same tip diameter and extend the length of the horn assembly. Extenders are available in 5" and 10" lengths with either solid, or replaceable tips.

Extenders offer the same processing volume and amplitude of their corresponding standard horn.

Part #	Type of Tip	Length	Tip Diameter
406HW	Solid Tip	5"	1/2" (13 mm)
406HWT	Replaceable Tip	5"	1/2" (13 mm)
407HW	Solid Tip	5"	3/4" (19 mm)
407HWT	Replaceable Tip	5"	3/4" (19 mm)
408HW	Solid Tip	5"	1" (25 mm)
408HWT	Replaceable Tip	5"	1" (25 mm)
407FW	Solid Tip	10"	3/4" (19 mm)
407FWT	Replaceable Tip	10"	3/4" (19 mm)
408FW	Solid Tip	10"	1" (25 mm)
408FWT	Replaceable Tip	10"	1" (25 mm)

Boosters

Booster horns increase the intensity of standard ¾" and 1" horns. Boosters attach between the converter and horn to increase amplitude by the gain ratio indicated below.

Part #	For Use With	Gain Ratio
4121	3/4" (19 mm) and 1" (25 mm) Probes	2 to 1

High Gain Horns

High gain horns (also known as high intensity horns) offer double the amplitude of standard ¾" and 1" horns. High gain horns attach directly to the converter.

Part #	Type of Tip	Processing Volume	Tip Diameter	Amplitude (microns)
4305	Replaceable Tip	50-500 ml	3/4" (19 mm)	120 µm
4306	Solid Tip	50-500 ml	3/4" (19 mm)	120 µm
4310	Solid Tip	100-1,000 ml	1" (25 mm)	60 µm
4311	Replaceable Tip	100-1,000 ml	1" (25 mm)	60 µm

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Dr. Heriberto Pfeiffer

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