dx

dental x the sterilization company

THE ELITE LINE

MX 230

the new generation

Dental X ... a partner with great experience

The spread of infectious diseases and the introduction of increasingly strict regulation have heightened interest for sterilization techniques worldwide. The fear of cross contamination risks and the resultant medical consequences, as well as legal, insurance and social consequences, have led to the pursuit of increasingly high-performing sterilization techniques.
Dental X has been in the sterilization business for more than 30 years.

During this period it has set new quality standards with the goal of making sterilization a safe and easy process while guaranteeing the health of thousands of patients all over the world.

The quest for excellence has been combined with the endeavor to reduce costs and consumption and define safe and simple protocols of use in compliance with the requirements of new standards and good practice.

MX 230 represents a new balance between technology, design and eco-sustainability.

MX 230 is the new state of the art in the sterilization sector.

«The best way to predict the future is to invent it»

Alan Kay

MX 230 ...the new state of the art in the sterilization sector

With the special Adaptive Heat heating system, MX 230 is suitable for sterilization of the most critical and delicate material.
The elimination of thermal stress actually means that the most delicate instruments can be safely sterilized thousands of times over.

The size of the chamber and special loading system, the Interactive system, allow the operator to arrange the material in the best manner with additional benefits in terms of performance.

MX 230 allows more instruments to be sterilized in less time and without problems:

- Faster cycles
- Greater load capacity
- Elimination of thermal stress

An innovative vacuum-assisted closure concept introduces a new standard of safety.

Innovation is what distinguishes the leaders from the followers

Innovation and technology
Dental X products are created in the name of innovation.
Research in state-of-the-art technologies is combined with the desire to provide products which are reliable and simple to use.
In the MX 230 project, we weren't satisfied with finding just any solution, but we sought the best solutions possible and incorporated them in an elegant and solid design.
Dental X doesn't limit itself to just observing the standards ... it actually defines new ones.

Simple
can be harder
than complex …

Steve Jobs

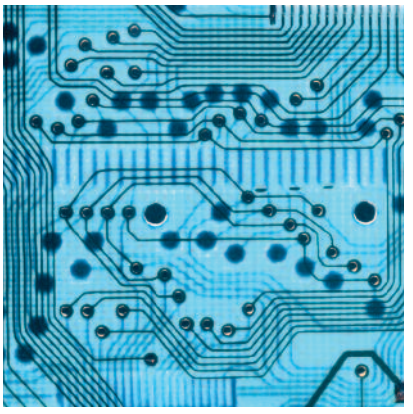
Exclusive performance
Nine automatic programs allow the MX 230 to meet all sterilization needs. With the Fast B program, a class B cycle can be carried out in less than 24 minutes (drying included), thus allowing quick sterilization of small quantities of wrapped or unwrapped instruments in case of emergency.

The class B Universal cycle requires about 35 minutes (drying included) and allows numerous cycles to be carried out non-stop throughout the day.

Up to 6 kg of wrapped instruments can be sterilized. The special Interactive loading system allows the operator to house the load in the most convenient manner in order to facilitate the circulation of the steam.

These outstanding performance qualities are not dependant on excessive power consumption, but rather the use of more innovative technologies and more efficient materials.

MX 230 ...the new standard in sterilization.



Design is not
"what it looks like"
... it's "how it works".

MX 230: An autoclave with outstanding energy efficiency

Consumption
A winning product not only meets the needs of the market, but it must also be consistent with the lines of development of the society in which it is used.

Our engineers not only strived to guarantee higher performance and safety levels, but they also endeavored to reduce energy consumption and offer users products with a low environmental impact.

With the copper chamber, the thermal efficiency of the autoclave exceeds that of models with steel chambers. Taking advantage of the unique qualities of copper, the special Adaptive Heat heating system reduces consumption and improves performance and reliability.

Some of the competitors' autoclaves have very high demands and, at times, require modifications to the electrical system which can create problems during installation.

Energy savings is also made possible by the tank preheating system which, in practice, recovers the thermal energy of the steam to heat and degas the water.

The components are compliant with recycling regulations and do not contain pollutants or agents harmful to the health.

Reliability
We are well aware of the importance of sterilization and the problems that can be caused by a broken autoclave.

This is why we have designed a machine of exceptional reliability, striving for technical solutions without compromises.

We didn't limit ourselves to simply choosing high-quality, reliable technologies and components; we tried to actually prevent problems by protecting the circuit with filters, including a series of preventive diagnostic measures and introducing an innovative monitoring and calibration system to quickly resolve any problems.

MX 230 ...because not all class B autoclaves are generated equal

The standard EN 13060 helped to raise the standard of sterilization, but it also levelled some characteristics and caused some people to think that all class B autoclaves are equal.

Not all class B autoclaves are the same.
Some are extremely slow, others break easily, some are not very flexible and offer few sterilization options, while others are complicated to use and repair.
Some have a very limited load capacity while others, on the contrary, can load much more instrumentation in the same volume.
Some consume a lot of water and energy, while others consume less … etc.

The MX autoclaves are swift and efficient, have lower than average consumption and are, above all, simple to use.

Adaptive Heat
This is an exclusive heating system designed to accelerate the sterilization cycles, reduce consumption and increase reliability.
This system also eliminates thermal stress and allows safer sterilization of the turbines and handpieces without the risk of early deterioration.

The Adaptive Heat heating system takes advantage of the conductive properties of the copper used to build the chamber.
The high conduction of copper made it possible to use a new-generation active heating element system that heats the chamber in a quick and homogeneous manner, without resorting to electronic devices, steam injection or high-power components and compromising the reliability of the heating elements themselves.

The copper - multiple heating element combination enables faster cycles with homogenous distribution of the steam while keeping the peak temperatures of the heating elements and surface temperatures of the chamber equal to the sterilization temperature, thus safeguarding the long-term service life of the heating elements and the reliability of the system as a whole.

With this innovative heating system, it is now possible to optimize the chamber volume and even position instruments near the external surfaces without the risk of over-heating.
Dental X autoclaves are equipped with a special support for trays and special trays that use the entire volume and increase the useful surface by about 57%.

«The road to success is always under construction»

Arnold Palmer

Complete automatism
The autoclave is equipped with 9 automatic programs, of which 1 can be customized. Any unused programs can be deactivated to simplify validation operations.
The touchscreen display shows the various phases of the cycle and the times.

The autoclave controls itself with a self-monitoring system, making the presence of an operator unnecessary and allowing the autoclave to carry out the night cycle in total safety.

The MX autoclave is set up to execute the following periodic control tests: Helix, Bowie & Dick and Vacuum Test.

The autoclave remembers to carry out an automatic maintenance cycle every 60 cycles.

Through the technical menus, it is also possible to make a detailed diagnosis and calibrate the autoclave remotely.

New sterilization parameters can be defined to adapt the autoclave operation to specific load types. This increases the adaptability of the autoclave to any new sterilization needs that may come up.

In the MX autoclaves, the commands and indicators on the display are clear and simple.

Uncomplicated operation and command clarity allow the autoclave to be used with ease even by non-experts and, more importantly, limit the risk of error.

A state-of-the-art sterilization chamber

The sterilization chamber
The chambers have been designed and manufactured in compliance with the ASME and PED regulations, and each pressure vessel is marked by a serial number for traceability and a quality certificate.
Each chamber is tested individually according to current regulations.
Copper has a thermal conduction 25 times higher than stainless steel.
Benefits:

- Faster cycles.
- More homogeneous distribution of the heat.
- Possibility to use more efficient heating systems.

To prevent oxidation, the copper chamber is submerged in an electrolytic nickel bath that gives the chamber an appearance similar to that of steel.

Since nickel is much harder than steel, the esthetic result is enhanced by greater mechanical strength as well. The chamber is scratch resistant and remains new-looking over time.
The nickel which is used is approved for use in the food industry, thus ruling out any health risks.
The elasticity of the copper and absence of any support welding of the chamber eliminate the risk of expensive maintenance.

The measure of excellence
The chamber size combined with the new Interactive heating system provide an optimal load capacity.
The 26 cm diameter for a depth of 43 cm allows convenient housing of up to 4 large boxes.

The competition often offers 22-24 liter chambers starting with chambers having a diameter of 24/25 cm.
This entails a development over depth that results in oblong chambers with no practical utility.
Furthermore, autoclaves with oblong chambers require very deep support surfaces which are not always available.

Interactive system: a new space concept

Interactive system
MX 230 expands the concept of integral space and load maximization already adopted by the Domina models. A special Interactive wrap-around rack allows to house different equipment.

The standard equipment includes 1 Extra Large tray, 2 Large trays and 2 Slim Interactive Plates.

For those who use boxes or have particular needs, Interactive special equipment is also available including 3 Large Interactive Plates and 2 Slim Interactive Plates.
This configuration allows the autoclave to house 4 large boxes and 4 small boxes and still have a free shelf for other instruments.

Moreover, the shelves can be used or removed to accommodate trays or special instruments.

Greater load capacity
The useful volume for the load of the autoclave is practically identical to the volume of the chamber, while conventional autoclaves have a useful volume of about 50% the chamber volume (see figure).

Greater flexibility
The innovative shelf system (Interactive plates) allows complete load flexibility.
The shelves can be positioned as desired, and any type of tray or box and various accessories can be placed on the shelves.
An infinite number of combinations can be implemented and, above all, the entire useful space can be used.

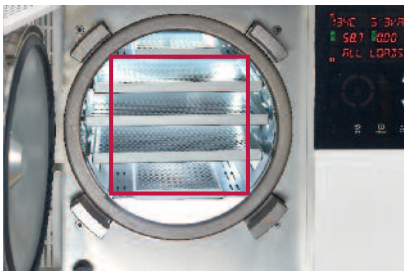
Improved performance
The heating and drying processes are faster since the contact surface between the rack and the chamber is significantly more extensive than that offered by conventional racks (100 to 1), thus the temperature of the chamber transfers to the rack and the trays faster and more efficiently without requiring excessive surface temperatures.

The combination of the special Adaptive Heat heating system and Interactive Rack loading system allows the instruments to be placed near the chamber itself without the risk of over-heating, which leads to premature wear of the instruments.

Rotational motion door vacuum assisted (RMDVA)
The automatic closing system adopted by Dental X is innovative and original.
Unlike all the competing systems which mainly use 2 fixing points and a beam, DX has adopted a rotational system with 4 fixing points.
The DX system that ensures 4 anchoring points is clearly safer. Even if one retainer fails, the chamber does not explode or create risks.

To facilitate the closing movement, the vacuum pump generates a small depression in order to reduce resistance during rotation of the disks.
The entire closing movement is thus soft and precise.

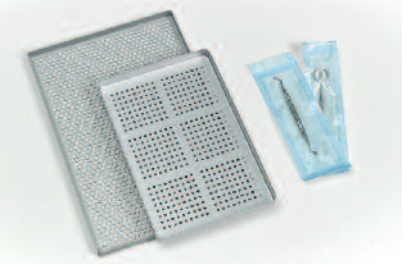
A special damper gives the closure improved sensitivity, thus preventing accidental closures.



Standard Interactive with 5 trays. The greater capacity compared to conventional loading systems is clearly visible.

Interactive special: It allows to house 4 large boxes + 4 small boxes … and even more.

Interactive special: The shelves can house any type of tray and can be used or removed as desired.



The trays used in the MX 230 autoclave are clearly more spacious than standard trays commonly used.

MX 230 ...committed to quality and innovation

Process evaluation system
This system allows to monitor the steam saturation.
The microprocessor continuously verifies the temperature – pressure correlation.

The process evaluation system checks that the temperature and pressure detection systems are correct and there are no false readings. In other words, the system is capable of self-control, as if there were 2 control systems inside the autoclave.
In this situation the margins of error are practically null.

Many alluring low-cost autoclaves do not have this system, which is required by standard EN 13060 for class B autoclaves as well as those of class S and N.
Without the process evaluation system the autoclave will not signal any malfunctions, thereby placing sterilization safety at risk.

Pump for the vacuum
The air is expelled by a double-head diaphragm pump which guarantees fast and quiet expulsion.
Under normal conditions, the pump can perform about 10,000 cycles.

The vacuum pump in the autoclaves of the MX series has a triple function:
1) Create the vacuum before sterilization.
2) Create a forced ventilation during the drying phase.
3) Facilitate the closure of the door by reducing resistance.

The specific diaphragm pump for autoclaves not only offers excellent performance even in the presence of humidity and high temperatures with guaranteed reliability, it also eliminates the environmental impact of liquid-ring pumps which consume enormous quantities of water to perform a single cycle.

Touchscreen display
The touchscreen display allows the operator to view commands and information simply on the display.
The touchscreen technology combines the performance of a touchscreen panel with the high visibility of LEDs.
The indicators are clear and highly visible, even from a distance or angled position.
In comparison with LCD technology, this system guarantees improved visibility and greater reliability.
LCD systems undergo significant deterioration if exposed to high temperatures.

Water Warm Up
This is an innovative system for preheating the water in the tank at zero cost, while cooling the steam and improving pump performance.
The preheating of the water in the tank also helps to degas the water and thus improve sterilization times.

Cooling system
For steam cooling during the depressurization phase, Dental X uses a large radiator with two-stage fan.
Cooling the steam improves the efficiency and service life of the pump as well as the sterilization times.

Inspectable filters
The quality of a product can also be found in the details.
The entire hydraulic circuit is protected by filters that prevent any impurities from entering the circuit and compromising proper operation of the solenoid valves and pump. All the filters can be easily inspected, cleaned or changed by the operator without requiring expensive service calls.

Air-water separator
To preserve the pump as long as possible and optimize efficiency, the separator eliminates the water and allows the pump to aspirate air only.

«The customer is the most important part of the production line»

Edward Deming

Volumetric doser
The autoclave uses water to generate steam.
The quantity of water that flows in the chamber is crucial for the overall quality of the sterilization process.
If too little is used, the cycle may fail due to lack of water. But if too much water is used, the cycle slows down and the times become longer.
The volumetric doser is a very reliable component, designed by our engineers and used exclusively by Dental X, that precisely measures the quantity of water.

In conventional systems with micropump, the quantity of water that enters the chamber is timed and thus may vary depending on the flow rate, which may decrease over time due to impurities or operating defects of the pump.

Water quality control system
To avoid using inadequate water and risking malfunctions or stains on the instrumentation, the autoclave is equipped with a water hardness control system.

Water autonomy
The autoclave is equipped with 2 large tanks (4.5 liters).
A special filter combined with a volumetric meter makes it possible to remove any algae or impurities that may inhibit operation of the autoclave.

The tanks have been designed for connection to the water mains. All the autoclaves can be connected to the drain.

For those who intend to connect both the filling and draining processes to the water mains, Dental X offers the Purity Plus reverse-osmosis system compliant with standard EN 1717.

For those, however, who are unable to connect to the water mains, water can also be filled automatically from an external tank.

Traceability and archiving of the sterilization cycles

Traceability
The MX autoclaves are equipped with a USB device to allow traceability and archiving of the cycles.

The USB system allows orderly storage of the sensitive data of the cycle in a file. The operator can download the files on the computer periodically and open them with a normal text program.

For those who also desire a paper report, a printer can be connected to the serial port housed inside the utility case.

Printers for adhesive labels
For an increased level of traceability, a special adhesive label printer is also available.
This printer can be used to print a number of labels equal to the number of bags inserted in the autoclave.
The label printer also allows to print barcodes.

Fan-assisted drying
Inadequate drying can compromise sterilization safety or cause deterioration or breakage of the instrumentation.
Sometimes, for the drying process, autoclaves raise the temperature well above the sterilization temperature, damaging the more delicate instrumentation.

MX 230 uses an exclusive drying system: the temperature, even during the drying process, never exceeds the sterilization temperature, and this is made possible by 2 exclusive factors:
- The high conductivity of copper
- The large contact surface of the tray rack.

The drying process is assisted by forced ventilation achieved by the vacuum pump. The air taken in through the bacteriological filter eliminates traces of condensate residue, thus guaranteeing dry bags.

The utility box, under the display, houses and protects some utilities:

N 1 USB flash drive (2GB)
N 1 RJ45 socket for technician/PC interface
N 1 Bacteriological filter
N 2 Quick connectors for draining the tanks
N 1 Serial socket for external printer

When traceability becomes simplicity and safety.

MX 230 ...connection to the water mains and more

Intensive use of class S autoclaves, high water consumption and the importance of the water quality have led to growing interest in supplying demineralized water.
Although the autoclave is equipped with two large 4.5 liter tanks, it is also possible to use some optional solutions.

Supplementary tanks with automatic filling
There is also the possibility to use 2 external tanks.
A special pump allows to automatically fill the tank of the autoclave.
This system is useful for increasing autonomy without resorting to external connections with the water mains.

DX425 Demineralizer
The DX425 demineralizer is available for those who cannot connect the autoclave to the water mains but have no desire to continue buying tanks of water.

This is a resin-based demineralizer that produces high-quality demineralized water directly in the practice.

This system is simple to install and remarkably efficient: 50 liters/hour. It practically allows to fill the tank instantaneously. The system uses cartridges which can be easily changed by the operator.

Purity Plus
Reverse-osmosis system
MX230 is set up to be connected to the PurityPlus reverse osmosis system. This system allows the autoclave to be connected directly to the water mains in conformity with standard EN 1717.

With its powerful pump, the Purity system functions correctly even on higher floors and in areas with low water pressure.

The water produced by Purity is high-quality water which sterilizes without leaving traces of scale on the instruments and components, with important advantages in terms of reliability.

Purity Plus:
The semplicity
of connecting
the autoclave
to the water mains.

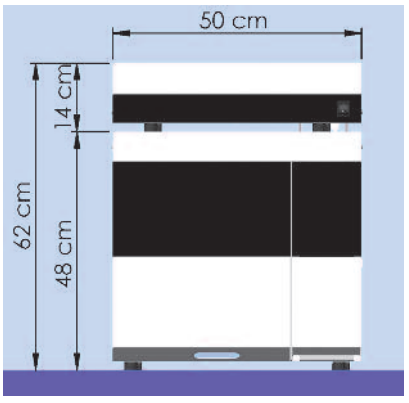
Technical characteristics

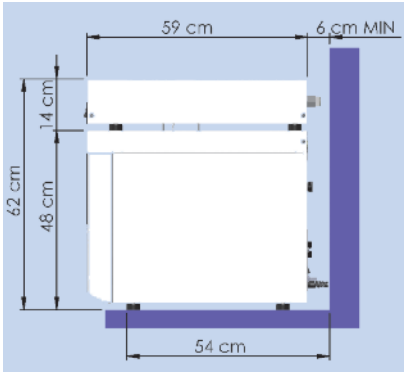
	Programs	Parameters	Indications	CL	Cycle* time	Drying Time
1	**1** All load Universal	134 °C - 5 min - 3 vac	For every load at 134°C included hollow instruments type A and B (helix test)	B	25 - 42	10
2	**2** All load Delicate	121 °C - 20 min - 3 vac	For every load at 121°C included hollow instruments type A and B (helix test)	B	37 - 43	11
3	**F** Unwrapped fast	134 °C - 4 min - 2 vac	Rapid sterilization for unwrapped instruments, included hollow instruments type A and B	S	18 - 24	3 - 5
4	**P** All load Prion	134 °C - 18 min - 3 vac	Prion cycle for every load at 134°C included hollow instruments type A and B (helix test)	B	38 - 54	10
5	**3** Critical Load	134 °C - 5 min - 4 vac	For very critical load at 134°C included hollow instruments type A and B (helix test)	B	28 - 45	13
6	**4** Critical Load	121 °C - 20 min - 4 vac	For very critical load at 121°C included hollow instruments type A and B (helix test)	B	40 - 55	13
7	**S** Special	from 105 to 135 °C from 3 to 90 min 2 - 3 - 4 vac	Parameters can be selected by the operator			
8	**5** High Porous	134 °C - 5 min - 3 vac	For all load which absorb a lot of water at 134°C included hollow instruments type A and B (helix test)	B	41 - 58	11
9	**6** Small load B	134 °C - 5 min - 3 vac	For small load at 134°C included hollow instruments type A and B (helix test) (max 0,5 Kg)	B	20 - 22	3 - 5
	BD Bowie & Dick	134 °C - 3,5 min	The Bowie & Dick enable to check the steam penetration in porous loads		25 min	
	Vacuum test	20 min at cold	This test enable to check the vacuum performances		20 min	

* The cycle time can change depending on load's type and quantity, the pre-heating, the power voltage and the use and maintenance conditions. The maximum load permitted is 6 kg for wrapped instruments and 7 kg for unwrapped instruments.

Steri Cart MX
The Steri Cart MX has been specifically designed to support the MX 230 autoclave. Equipped with solid wheels and counterweights, it allows the operator to move the machine easily and safely for service and maintenance operations and to house the 2 backup tanks for filling and draining the reservoirs. The cart also provides a convenient support surface to facilitate loading and unloading operations.

External dimensions





Technical specifications	MX 230
External dimensions	L. 500 x H. 480 x D. 590 mm
Minimum top deepth	540 mm
Supply voltage	230 V - 50 / 60 Hz
Average power consumption	900 W
Max power consumption	2700 W
Net weight	62 kg
Chamber capacity	23 lt
Chamber dimensions	Ø 260 x P. 430 mm
USB Log	■
Process evaluation system (EN13060)	■
Vacuum pump	■
Heating system	«Adaptive Heat»
Night cycle	■
Auto-diagnosis	■
Automatic programs	9
Drying system	with vacuum pump
Water recervoirs	N 2 recevoirs 4,5 lt each
Pre-heating	■
Serial Plug	■
PC connection*	■
Cycle counter	■
Protection filters	■
Volumetric doser	■
Water pump	■
Warm-up System	■
Interactive System	■
Water separator	■
Warranty 2 years / 2000 cycles	■
Cycles (Type)	B and S

* The PC connection can only be made through a special interface provided to the technicians.

Sterilization tests

To verify the sterilization quality, regulations indicate some tests which demonstrate the effectiveness of the autoclave.

Multi-parameter tests
These are test samples which ascertain exposure to temperature, pressure and time. Normally they are inserted in various positions within the load.

Helix test
This is a test used to verify the penetration of steam in the hollow bodies. It is a very important test which should be carried out every day before performing the first cycle.

Bowie & Dick Test
This test verifies the penetration of steam in porous material. It is a test which is not used much in the sector of bench autoclaves intended mainly for the sterilization of instruments.

Barcode Printer
For those who desire an increased level of traceability, a barcode adhesive label printer is available.
The printer can be connected to the serial port in the utility box and prints the desired number of labels complete with barcode.

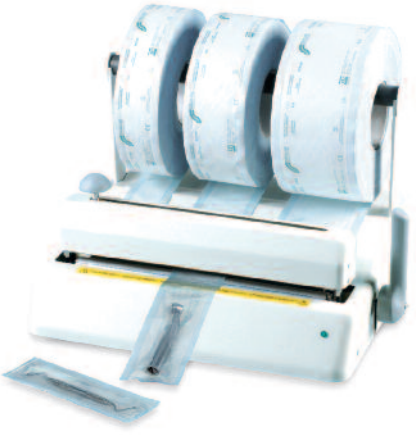
Dental X ... the sterilization company

Sealer
The bag sealer can be used to preserve sterility even after the sterilization cycle (EN 11607-2 and EN 868-5).

All the Dental X sealers can be used to seal bags simply and safely while eliminating any risk of over-heating.

The use of Steriline rolls is recommended, as they allow to preserve sterility for 90 days and do not cause inconvenient malfunctions of the autoclave due to disintegration of the paper (often seen in the low-cost rolls).

Newseal
Linear sealer with roll holder and retractable blade.
Guarantees a 10 mm seal.
Available with 1 or 2 LEDs.



Steriline Med-V
Roll sealer with the possibility to adjust the temperature and pressure. It can also be validated.

Dental X spa
is ISO 900 1 and ISO 13485 certified since 1995.

The certification has been issued by SGS, one of the most prestigious certification bodies worldwide.

The reputable SGS certification body is recognized worldwide for its expertise and reliability.

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