



S T E R I D I U M

Australia's premium manufacturer
of medical and laboratory products

SD series

MEDICAL & LABORATORY AUTOCLAVES

TECHNICAL DATA SHEET

The SD series of high temperature steam sterilizers (autoclaves) have horizontal chambers with vertical sliding doors. The chambers are fully jacketed over all four sides and back. They are available in various sizes and configurations of materials, doors, vacuum systems, steam generation, sterilizing cycles, recording systems, and loading equipment.

DIMENSIONS

There are three basic cross-sections of chamber:

- 460mm x 460mm square
- 660mm x 660mm square
- 660mm x 960mm rectangular

The chambers can be manufactured to any specified depth - common sizes are shown below.

model number	chamber volume (litre)	chamber dimensions (mm)
SD 460 X 760	160	460 (w) x 460 (h) x 760 (d)
SD 460 X 950	200	460 (w) x 460 (h) x 950 (d)
SD 460 X 1200	250	460 (w) x 460 (h) x 1200 (d)
SD 460 X 1450	300	460 (w) x 460 (h) x 1450 (d)
SD 660 X 915	400	660 (w) x 660 (h) x 915 (d)
SD 660 X 1250	550	660 (w) x 660 (h) x 1250 (d)
SD 660 X 1500	650	660 (w) x 660 (h) x 1500 (d)
SD 660 X 1850	800	660 (w) x 660 (h) x 1850 (d)
SD 960 X 1600	1000	660 (w) x 960 (h) x 1600 (d)
SD 960 X 1900	1200	660 (w) x 960 (h) x 1900 (d)

MATERIALS

The chamber and jacket are manufactured in various grades of stainless steel. Many sterilizer pressure vessels fail from pitting and stress corrosion cracking as a result of poor water quality in the steam generators. *Steridium* autoclaves incorporate an automatic blowdown feature into its steam generators which reduces this risk and makes the use of exotic materials such as 316Ti and SAF 2205 unnecessary. However they can be supplied on request in order to meet client's individual requirements or tender specifications. Chambers are electro-polished to give a high quality surface finish.

Chamber	304 L stainless steel	
	316 L stainless steel	STANDARD
	316 Ti stainless steel	
	SAF 2205 duplex stainless steel	
Jacket	304 L stainless steel	STANDARD
	316 L stainless steel	
	316 Ti stainless steel	
	SAF 2205 duplex stainless steel	
Door	304 L stainless steel	STANDARD
	316 L stainless steel	
	316 Ti stainless steel	
	SAF 2205 duplex stainless steel	

PRESSURE VESSEL DESIGN

The pressure vessels are designed and manufactured in accordance with the European pressure equipment directive (PED) 97/23/EC, European standard PD 5500, and Australian standard AS 1210. The designs are appraised by internationally registered inspection authorities (*e.g. Lloyds Register*) who also carry out the inspection during production, testing and final certification.

Maximum working temperature	140 C
Maximum working pressure	265 kPag

INSULATION

The chamber and doors are insulated with high density, CFC-free, mineral wool insulation. This is bright aluminium backed to protect the insulation from damage and reduce heat loss through radiation.

Insulation thickness	25mm
Maximum surface temperature	45 C

FRAMEWORK

The framework is manufactured from welded tubular steel.

Material	304 stainless steel	STANDARD
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PANELLING

The door cover and front panelling are made of satin finish, grade 304 stainless steel fitted to an anodised aluminium trim. Where machines are free-standing and not recessed into a partition wall, stainless steel side covers are fitted which can be easily removed for maintenance purposes.

PIPES AND VALVES

Pipes are welded or soldered wherever possible to minimise the risk of leakage. Valves and other components are installed using high quality compression fittings for ease of removal for maintenance.

Valves	220V electric solenoid pilot operated pneumatic	STANDARD
Piping	high pressure copper stainless steel	STANDARD

VACUUM SYSTEMS

Vacuum is created by means of either a liquid ring vacuum pump, or a water ejector driven by a centrifugal pump. Liquid ring vacuum pumps are fitted with high efficiency tube condensers between the chamber drain and the pump to prevent overheating and cavitation of the pump, and resulting in a long service life.

The standard vacuum system uses water ejectors which have no moving parts and require no condenser to achieve the high levels of vacuum required in medical sterilizers.

Liquid ring vacuum pumps are required where instruments containers are sterilized and which require high degrees of drying using *Steridium's* pulsed-air drying techniques. Liquid ring vacuum pumps are used as standard on low temperature steam & formaldehyde (LTSF) sterilizers, as pulsed air-drying is required to effectively dry the loads at temperatures as low as 55 C.

AIR FILTRATION

Air admission to the autoclave is via a high performance sterile air filter which removes all bacteria and viruses.

Material	PTFE impregnated microfibre
Maximum particle size	0.01 micron

DOORS

All doors are counterbalanced, vertical-sliding.

MANUAL OR AUTOMATIC

The **SD 460** doors can be operated manually (STANDARD) or automatically, while the **SD 660** and **SD 960** doors are only operated automatically. In the case of manual operation, the doors are perfectly counterbalanced, enabling the user to close or open the door with the slightest effort. Automatic doors are actuated by an electric motor.

SAFETY

Limit switches are fitted to detect when the doors are fully open or fully closed. Safety interlocks prevent the sterilizing cycle from being started unless the doors are fully closed, and also prevent the doors from being opened unless the pressure within the chamber is within safe limits. A safety flap is fitted to the top leading edge of automatic doors so that in the event of the door being jammed by personnel or equipment, the door will automatically open.

The control system monitors the operation of the automatic doors and will alert the operator to a faulty or jammed door should it not open or close within a set period of time.

PASS-THROUGH SYSTEMS

Automatic double door systems can be programmed to operate depending on the specific material flow requirements. However the two doors are interlocked to prevent both doors being opened at the same time.

DOOR GASKETS

The doors are sealed by high temperature silicone gaskets fitted into grooves machined into the body of the autoclave. The gasket is inflated by steam to provide a leak-free seal during a cycle, and retracted by vacuum at the end of the cycle to ensure it is clear of the door surface.

CONTROL SYSTEMS

Every autoclave is fitted with *Steridium's* microprocessor based embedded control system. This is a modular system which uses discrete modules for digital inputs, digital outputs, and analogue inputs. Each unit can hold up to 20 sterilizing cycles, while the simplicity of the system enables users to easily modify cycles or built completely new cycles.

Main control unit	
Microprocessor	AMD 80188 / 80186 series
Communications ports	RS232, RS 485
Memory	512k SRAM
Analogue inputs	
Channels	Jacket temperature
	Boiler temperature
	Chamber temperature (control)
	Chamber temperature (monitor)
Input type	PT100
Temperature resolution	0.1 C
Pressure resolution	0.1 kPa
Sampling rate	10 samples / second
Digital inputs	
Channels	20 – single door systems
	36 – double door systems
Isolation Voltage	3750Vrms
Indication status	LED for each channel
Digital outputs	
Channels	16 – single door systems
	32 – double door systems
Isolation Voltage	3750Vrms
Indication status	LED for each channel
Operator display	Alpha numeric 2-line vacuum fluorescent display
Printer	Panel mounted – RS 232.
	Plain paper

STERILIZING CYCLES

The following cycles can be installed on each machine, up to a limit of 20 cycles per machine. The cycles can easily be edited by an authorised person using the software supplied by *Steridium*. There is no need for any specialised programming knowledge to add new cycles or change existing cycles. However it is recommended that only those persons trained in the operation of autoclaves be authorised to add or change cycles.

MEDICAL CYCLES	Packs (porous loads) @ 134 C
High temperature	Packs (porous loads) @ 121 C
	Fluids @ 121 C
	Pouched instruments @ 134 C
	Open instruments (flash) @ 134 C
	Containers @ 134 C
	Containers @ 121 C
	Prions @ 134 C
	Prions @ 121 C
Test cycles	Bowie & Dick Test @ 134 C
	Vacuum Leak Test

MEDICAL CYCLES	LTSF @ 60 C, 70 C, 80 C
Low temperature steam & formaldehyde (LTSF)	
Test cycles	LTSF cleaning cycle LTSF vacuum leak test
WASTE CYCLES (Medical & Laboratory)	Solid waste @ 134 C Liquid waste @ 121 C
LABORATORY CYCLES	Packs (porous loads) @ 134 C Packs (porous loads) @ 121 C Fluids @ 121 C Metalware @ 134 C Plasticware @ 121 C Culture media @ 121 C Culture media @ 115 C Culture media @ 105 C Prions @ 134 C Prions @ 121 C Decontamination (pasteurising) @ 70C
Test cycles	Bowie & Dick Test @ 134 C Vacuum Leak Test

STEAM GENERATORS

The autoclaves require a reliable source of pressure regulated steam. When this is not available, integral steam generators can be supplied, either built-in to the sterilizer or as freestanding packages.

Material	304L (standard), 316L, 316Ti
Maximum working pressure	400 kPa
Safety features	Over pressure cut-out Low- water cut-out Pop-type side discharge safety valve
Water level control	Float-less conductance switches Pressure booster feed pump
Power ratings	18kW, 36kW, 45kW, 60kW, 72kW depending on process, chamber volume and application

WATER QUALITY SYSTEMS

The steam generators are fitted with a boiler blowdown system which allows the use of normal potable tap water. It maintains water quality within the boiler and prevents the levels of TDS (total dissolved solids) and chlorides within the boiler rising to unacceptable levels. Without this system, boiler priming would occur and water would be carried over into the steam supply and result in wet packs and corrosion of the chamber.

SERVICE CONNECTIONS

Steam	Regulated @ 300 – 350 kPa. Saturated. Dry.	¾" BSP
Water	Regulated @ 100 – 700 kPa. Potable	½" BSP
Power	No steam generator – manual door	220V, 1-phase, 10A
(Other voltages available on request)	No steam generator – automatic door	380V, 3-phase, 10A/phase
	Steam generator – 18 kW	380V, 3-phase, 32A/phase
	Steam generator – 36 kW	380V, 3-phase, 60A/phase
	Steam generator – 45 kW	380V, 3-phase, 80A/phase
	Steam generator – 60 kW	380V, 3-phase, 100A/phase
	Steam generator – 72 kW	380V, 3-phase, 125A/phase
Compressed air	For pneumatic valve option only	Regulated 600 – 700 kPa
Drain	Must be able to withstand up to 100 C	1", 1 ¼" BSP