GUARDIAN™

Hotplates & Stirrers Comparison Guide

The Guardian Hotplates & Stirrers Comparison Guide gives you an in-depth look into the differences between the 4 levels of the Guardian series. Use both the chart and frequently asked questions to find which Guardian works best for your lab.

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GUARDIAN™ *Comparison Chart*

				
Features	**GUARDIAN 7000**	**GUARDIAN 5000**	**GUARDIAN 3000**	**GUARDIAN 2000**
Functions	Hotplate-Stirrer	Hotplate-Stirrer Hotplate Stirrer	Hotplate-Stirrer	Hotplate-Stirrer Hotplate Stirrer
Top Plate Dimensions	7x7 inch (17.8 x 17.8 cm) 10x10 inch (25.4 x 25.4 cm) Round 5.3 inch diameter (13.5 cm)		4x4 inch (10.2 x 10.2 cm) 7x7 inch (17.8 x 17.8 cm) Round 5.3 inch diameter (13.5 cm)	
Top Plate Material	Ceramic = 7x7 and 10x10 Aluminum = Round	Ceramic = 7x7 and 10x10 Resin = 7x7 Stirrer Aluminum = Round	Ceramic = 4x4 and 7x7 Ceramic Coated Steel = Round	Ceramic = 4x4 and 7x7 Resin = 4x4 and 7x7 Stirrer Ceramic Coated Steel = Round
Housing	SmartHousing™		Painted Aluminum	
Control	Digital/Microprocessor			Analog
Hot Top Indicator	Triangle and Progress Bar	Triangle Only		
SmartLink™	Yes	–		
SmartPresence™	Yes	–		
SmartRate™	Yes - Temperature and Speed	–		
SmartHeat™	Yes	–		
SafetyHeat™	Yes			–
Programmability	Yes	–		
LCD - Display	4.3 x 1.3 in (10.9 x 3.3 cm)		2.9 x 0.8 in (7.4 x 2.0 cm)	No Display
LCD - Timer	Yes	–		
LCD - Temperature	Set and Actual	Toggle to see Set and Actual		No Display
LCD - Speed	Set and Actual	Set		No Display

				
Features	**GUARDIAN 7000**	**GUARDIAN 5000**	**GUARDIAN 3000**	**GUARDIAN 2000**
Front Panel Material	Glass	Polycarbonate	PET	
Temperature Range	Ambient +5°C - 500°C (ceramic) Ambient +5°C - 380°C (Aluminum and Ceramic Coated Steel)			70°C - 500°C (ceramic) 50°C - 380°C (Aluminum and Ceramic Coated Steel)
Temperature Stability - plate	+/- 1% >100°C +/- 1°C < 100°C	+/- 3% >100°C +/- 2°C < 100°C		–
Temperature Stability - probe	+/- 0.5% >100°C +/- 1°C < 100°C	+/- 1% >100°C +/- 1°C < 100°C	+/- 2% >100°C +/- 2°C < 100°C	No Probe Connector
Temperature Accuracy - probe	+/- 0.5°C (@100°C after SPC)	–		No Probe Connector
Temperature Readability	0.1°C	1°C		–
Temperature Calibration - plate	5 points	3 points	1 point	–
Temperature Calibration - probe	5 points	3 points	1 point	–
Time to Boil	1 L in 2 L beaker 7x7 = 21 min 10x10 = 25 min Round = 24 min		500 mL in 1 L beaker 4x4 = 30 min 7x7 = 18 min Round = 25 min	
Stir Capacity	7x7 = 15 L / 10x10 = 18 L / Round = 20 L		All Models = 15 L	
Speed Range	60 - 1600 rpm		80 - 1600 rpm	200 to 1600 rpm
Speed Stability	+/- 2%			–
IP Rating	IP21			
Footprint	7x7 = 12.2 x 8.8 in (30.9 x 22.3 cm) 10x10 =16.3 x 11.3 in (41.5 x 28.6 cm) Round = 10.5 x 6.8 in (26.7 x 17.3 cm)		4x4 = 10.4 x 6.4 in (26.4 x 16.3 cm) 7x7 = 12.5 x 8.8 in (31.8 x 22.3 cm) Round = 10.4 x 6.4 in (26.4 x 16.3 cm)	
Power Consumption	7x7 = 1080W (120V) / 1242W (230V) 10x10 = 12110W (120V) / 1149W (230V) Round = 896W (120V) / 952W(230V)		4x4 = 550W 7x7 = 1050W Round = 550W	4x4 = 535W 7x7 = 1035W Round = 535W

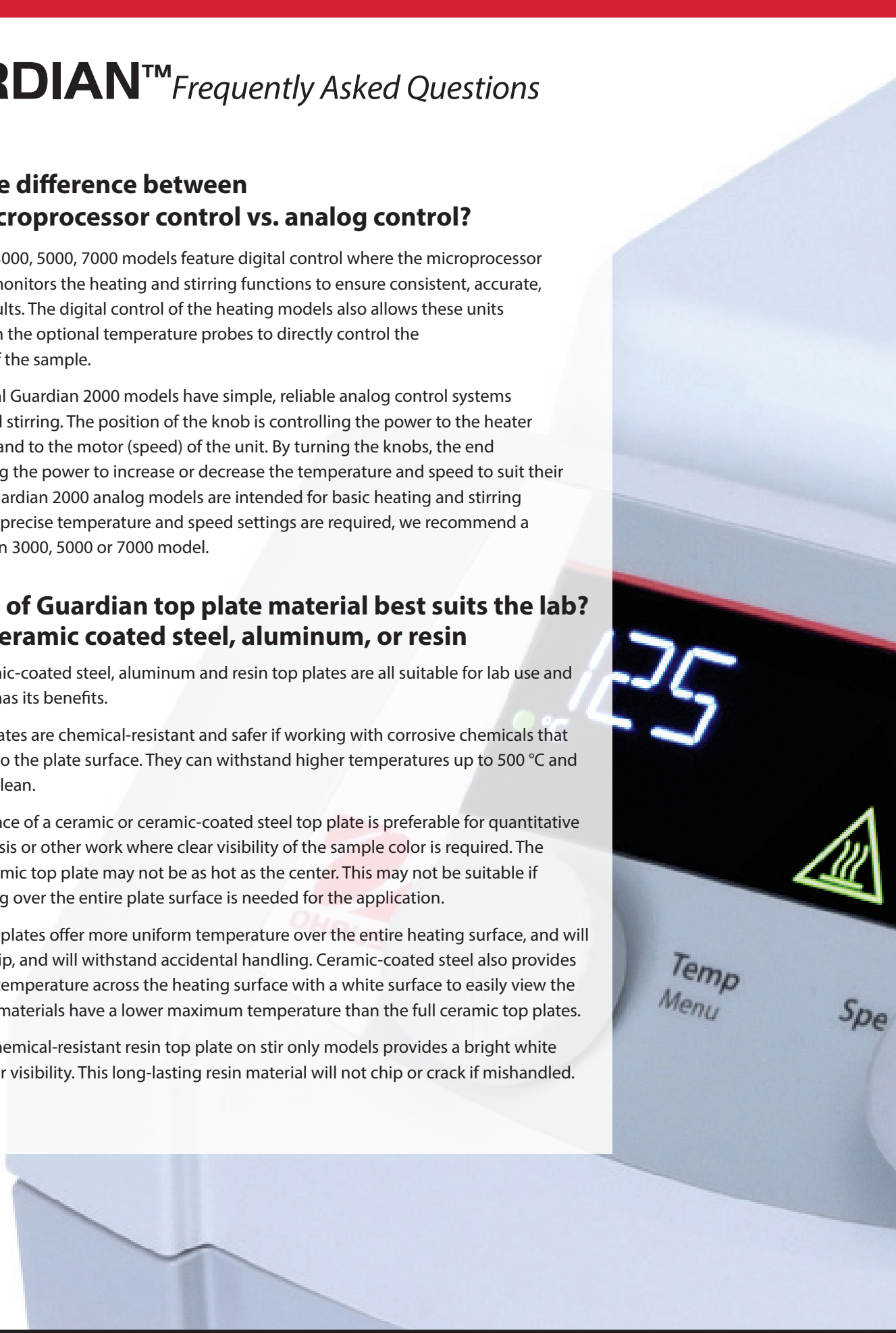
GUARDIAN™ *Frequently Asked Questions*

What is the difference between digital/microprocessor control vs. analog control?

- The Guardian 3000, 5000, 7000 models feature digital control where the microprocessor continuously monitors the heating and stirring functions to ensure consistent, accurate, repeatable results. The digital control of the heating models also allows these units to be used with the optional temperature probes to directly control the temperature of the sample.
- The economical Guardian 2000 models have simple, reliable analog control systems for heating and stirring. The position of the knob is controlling the power to the heater (temperature) and to the motor (speed) of the unit. By turning the knobs, the end user is adjusting the power to increase or decrease the temperature and speed to suit their application. Guardian 2000 analog models are intended for basic heating and stirring applications. If precise temperature and speed settings are required, we recommend a digital Guardian 3000, 5000 or 7000 model.

What type of Guardian top plate material best suits the lab? Ceramic, ceramic coated steel, aluminum, or resin

- Ceramic, ceramic-coated steel, aluminum and resin top plates are all suitable for lab use and each material has its benefits.
- Ceramic top plates are chemical-resistant and safer if working with corrosive chemicals that may splash onto the plate surface. They can withstand higher temperatures up to 500 °C and can be wiped clean.
- The white surface of a ceramic or ceramic-coated steel top plate is preferable for quantitative chemical analysis or other work where clear visibility of the sample color is required. The edges of a ceramic top plate may not be as hot as the center. This may not be suitable if uniform heating over the entire plate surface is needed for the application.
- Aluminum top plates offer more uniform temperature over the entire heating surface, and will not crack or chip, and will withstand accidental handling. Ceramic-coated steel also provides more uniform temperature across the heating surface with a white surface to easily view the sample. These materials have a lower maximum temperature than the full ceramic top plates.
- The durable, chemical-resistant resin top plate on stir only models provides a bright white surface for clear visibility. This long-lasting resin material will not chip or crack if mishandled.



Which safety features are built into the Guardian Series for use in academic settings?

- All Guardian heating models feature a prominent 13 mm Hot Top Indicator Light to alert the end user that the top plate surface is hot and not safe to the touch. This hot top light stays on even when the power switch is turned off. This important feature will help prevent accidents in all settings and especially academic labs where students are using hotplates and hotplate stirrers.
- The Guardian 2000 models feature simple overheat protection where the unit will turn off the heating function if the temperature exceeds the upper limit.
- Guardian 3000, 5000 and 7000 Series heating models feature SafetyHeat™; an industry leading early detection system that uses two independent safety controls to monitor the electronics and stop heating before an overtemperature condition occurs. This important feature protects the sample, the user, and the lab by preventing accidents that occur due to overheating samples.
- The digital control Guardian 3000, 5000 and 7000 models are designed so the user must press the knob to start the heating and stirring function. This knob press is also needed to change a setting. This secondary step provides an additional layer of safety by making the user acknowledge the setting. The analog control Guardian 2000 are simple knob control and easy to use where turning the knob starts the function or adjusts the current setting.
- All Guardian Series models have chemical-resistant housings and feature an easy-to-clean design that channels spills away from internal components and the front panel which protects the unit. The Guardian 5000/7000 Series models are constructed with the SmartHousing™ that remains cool to the touch at all temperature settings. The Guardian 2000/3000 Series feature a rugged metal housing that will withstand harsh conditions in the lab and also remains safe to the touch at all temperatures.

GUARDIAN 7000

GUARDIAN 5000

GUARDIAN 3000

GUARDIAN 2000

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