Sustainability, Energy Efficiency and Lab Equipment

Drying Ovens – Genlab E3 Drying Cabinets

The Genlab E3 range are the most energy efficient drying cabinets available.

Some of the key features and benefits include:

- Lowest Energy Consumption and Heat Output
- Being fully insulated with adjustable vent cover
- An programmable 7 day timer
- A microprocessor controller with fixed over-temperature safety cut-out
- Being Salix funding approved.
- UK Manufactured
- Long lifespan (~15 years)

Manufacturer	Fan/Convection	Capacity (L)	Set Temp. (°C)	kWh/Day	W/L/Day	Warranty (Years)	Estimated Life Span (Years)	Origin	Insulation	Temp. Controller	Built-in Timer
Genlab (C)	Convection	200	75	8.65	43.24	2	15	UK	Yes	Microprocessor	Yes
Genlab (F)	Fan	200	75	12.97	64.84	2	15	UK	Yes	Microprocessor	Yes
LEEC	Convection	200	75	15.25	76.25	1	15	UK	No	Simmerstat	No
LTE	Convection	200	75	19.48	97.40	1	15	UK	No	Simmerstat	No

The following case studies highlight some of the energy and running costs savings that have been achieved by customers who have already purchased Genlab E3 glassware drying cabinets as part of an equipment replacement project.

- **King's College London:**

The university achieved an energy saving of at least 139,507.82 kWh per year, an electricity cost saving of at least £15,206.36 per year and at least a 56% reduction in CO2 emissions.

- **University of Warwick:**

The university achieved an energy saving of 85,106.31 kWh per year, a cost saving of £8,510.63 per year and a 71% reduction in CO2 emissions.

Centrifuges – Thermo Scientific Range

Centrifuges within the Thermo Scientific range have the following sustainability features.

- The operation of Heraeus® Multifuge® centrifuges are energy efficient as their design saves up to 40% of energy on industry standard protocols, such as blood separations or conical-tube processing.
- With the Heraeus® Megafuge® centrifuges less energy is consumed per tube –up to 40% fewer watts per tube than competing models – since larger capacity reduces number of runs required for a given batch of samples. The "powersave" feature, enabled by default, that turns off the display when not in use achieves a 15% energy saving compared with standard stand-by power consumption
- Medifuge™ small benchtop centrifuges have a lightweight composite rotor that saves energy during acceleration/deceleration

Centrifuges - VWR Collection

Centrifuges within the VWR Colllection Range are as energy efficient as the Thermo Scientific range. For example, the Heraeus® Megafuge® 16 and the VWR Mega Star 1.6 both have a power consumption figure of 1010W. Also, as the VWR Mega Star 1.6 centrifuges are fully compatible with the Thermo Scientific centrifuge rotors, they have the same capacity; and therefore also use up to 40% fewer watts per tube as the larger capacity reduces number of runs required for a given batch of samples.

-80 ULT Freezers – NBS/Eppendorf CryoCube F570h

The CryoCube ULT freezers are energy efficient without compromising their temperature performance.

Some of the key features and benefits include:

- Low energy consumption (7.6 kWh/day at -80 °C)
- High-efficiency fan, compressor, and condenser
- The use of HC refrigerants which are more energy efficient and have a significantly lower Global Warming Potential than HFC refrigerants
- High quality insulation to allow for cabinet stability and slow warm up times
- Flexible flat door seals to prevent ice buildup
- Long lifespan (15+ years)
- Low heat output
- 5 year parts & labour

- UK Manufactured
    - Spares readily available / more affordable
    - Servicing cheaper & quicker
    - Smaller carbon footprint than those manufactured outside of the UK

Manufacturer	Model	kWh/day	W/L (Day)	Warranty (Years)	Estimated Life Span (Years)	Refrigerant Type	Origin	Insulation	Noise dB
NBS	F570h	7.6	13.33	5	20	HC	UK	VIP & PUF	59.1
Thermo	TSX400V (SP Mode)	7.90	14.42	5	10	HC	Outside Europe	VIP & PUF	47.5
NBS	U570HEF	8.20	14.12	6	20	HC	UK	VIP & PUF	58
DaiHan	WUF-D500 (Eco Mode)	8.30	16.50	2	?	HFC	Outside Europe	VIP	?
Thermo	TSX600V (SP Mode)	8.7	10.67	5	10	HC	Outside Europe	VIP & PUF	45.5
Panasonic	MDF-DU500VH-PE	9.3	17.68	5	10	HC	Outside Europe	VIP & PUF	52
Thermo	TSX400V (HP Mode)	9.40	17.50	5	10	HC	Outside Europe	VIP & PUF	47.5
Thermo	TSX600V (HP Mode)	10.2	12.52	5	10	HC	Outside Europe	VIP & PUF	45.5
Haier	DW-86L728J	10.50	14.74	5	15	HC	Outside Europe	VIP & PUF	50
DaiHan	WUF-700	10.70	14.99	2	?	HFC	Outside Europe	VIP	?
DaiHan	WUF-D700	11.20	15.69	2	?	HFC	Outside Europe	VIP	?
Panasonic	MDF-DU700VH-PE (KM-DU73Y1E)	11.50	15.73	5	10	HC	Outside Europe	VIP & PUF	52
NBS	U725G	12.20	16.80	6	20	HC	UK	VIP & PUF	57.6
Skadi	DF8520GL	12.24	20.24	5	10	HC	Europe	PUF	49
VWR	-86C Upright 650L	13.1	20.15	2	10	HFC/HC	Outside Europe	PUF	59
Panasonic	MDF-U76V-PE	13.50	18.47	5	10	HFC	Outside Europe	VIP & PUF	49
Binder	UFV700	13.90	19.56	6	12	HC	Europe	VIP & PUF	49
Skadi	DF8524GL	14.16	19.41	5	10	HC	Europe	PUF	50
Telstar	Igloo U570	16.56	29.40	5	10	HC	Europe	VIP & PUF	50.1
Thermo-Revco	UxF40086V	16.90	30.78	3	10	HFC	Outside Europe	PUF	np
Thermo-Forma	88400D	16.90	30.86	3	10	HFC	Outside Europe	PUF	np
Thermo-Revco	UxF50086V	17.00	24.90	3	10	HFC	Outside Europe	PUF	np
ESCO	UUS-597**	18.10	30.35	3	10	HC	Europe	PUF	50
Thermo-Revco	ExF400	19.30	29.53	2	10	HFC	Outside Europe	PUF	np
Panasonic	U7386S	27.36	40.95	5	10	HFC	Outside Europe	PUF	49
Nuaire	NU-9668E (HFC)	29.04	43.46	4	10	HC	Outside Europe	PUF	

Incubators – Thermo Scientific Range

The Heracell 150i CO2 incubator with solid copper interior has the following sustainability features.

- Low energy consumption (0.06 kWh/h @ 37 °C)
- Long lifespan (~15 years)
- DC fan
- The 100% pure antimicrobial copper interior provides non-stop bactericidal and fungicidal properties on contact; and therfore reduces the need for high temp energy intensive decontamination cycles which consume 2.5kWh of energy per cycle.

Manufacturer	Model	Capacity (L)	(kWh/hr)	(kWh/day)	W/L	Decontamination Cycle	Fan?	Warranty (Yrs)	Estimated Life Span	Origin	Noise Level (dB)	Interior Material
Thermo	Heracell 150i	150	0.06	1.44	9.60	90°C Moist heat 2.5kWh per cycle (25 hrs)	Fan DC	2	15	Europe	50	Stainless Steel or Copper
NBS/Eppendorf	Galaxy 170 S/170 R	170	0.08	1.92	11.29	High temp. 120°C 3 kWh per cycle (estimated)(14 hrs)	Convection	1	10	Europe	Not Shared	Stainless Steel or Copper
BINDER	CB 160	150	0.1	2.40	16.00	Hot air 180°C 4 kWh per cycle (10 hrs)	Fan	2	10	Europe	48	Stainless Steel
Panasonic/Sanyo	MCO-170AIC	165	0.1	2.40	14.55	UV and Hydrogen peroxide	Fan AC	1	10	Outside Europe	29	Copper-enriched Stainless Steel
Esco	CCL-170	170	0.08	1.92	11.29	90°C moist heat 2.5kWh per cycle (estimated)(15 hrs)	Fan	2	6	Outside Europe	Not Shared	Stainless Steel

Autoclaves – Priorclave

Priorclave autoclaves have the following sustainability features.

- Energy consumption is reduced by automatically turning off the elements in chamber at the end of a cycle.
- Selected external panels and surfaces are thermally insulated to reduce heat output into the room and reduce energy usage.
- Steam is generated by an element in the chamber which provides a water saving over that of a steam generator.
- UK Manufactured
    - Spares readily available / more affordable
    - Servicing cheaper & quicker
    - Smaller carbon footprint than those manufactured outside the UK

Microbiological Safety Cabinets – Envair Eco Safe Comfort+

The Envair Eco Safe Comfort + has the following features and benefits.

- Low energy consumption 0.084 kWh/hr
- DC motors which use 40% less energy than AC motors and are quieter.
- Energy efficient LED lighting
- 100% polyester plenum rather than a metal plenum – reduces noise.

- Low pressure drop HEPA filters – having a thicker filter reduces noise and also reduces enrgy consumption as less effort is required to transfer the air.
- The advantage of having a large cabinet depth (855 mm) is that there is a larger gap for the air to go through; therefore, energy consumption is reduced as less effort is required to move the air and the noise level is reduced.

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Manufacturer	Model	kWh/hr	kWh/8 Hrs	Warranty (Yrs)	Estimated Lifespan (Yrs)	Noise dB	Filter Depth	Fans	Lighting	Origin	EN12469 Certified
Scanlaf	Mars Silence1200	0.08	0.64	5	15	43	110mm	DC	LED	Europe	Yes
Envair	eco safe Comfort Plus	0.084	0.67	2	15	42.5	110mm	DC	LED	Europe	Yes
Monmouth	Guardian MSC1200	0.12	0.96	5	Not shared	54	Not shared	DC	LED	UK	No
Walker	Walker 1200	0.16	1.28	5	15	56	66mm	AC	Fluorescent	UK	No
CAS	BioMAT2	0.19	1.52	3	10	58	66mm	AC	Fluorescent	UK	No
Thermo	Safe 2020	0.20	1.60	2	15	55	94mm/117mm	DC	Fluorescent	Europe	Yes
Esco	EC24LA/4SA	0.22	1.76	3	10	56	66mm	DC	Fluorescent	Outside Europe	Yes
Nuaire	NU480-400	0.30	2.39	4	15	56	Not shared	DC	Fluorescent	Outside Europe	Yes

Note: The warranties for the Monmouth, Walker and Nuaire units are subject to a yearly service by the respective manufacturers.