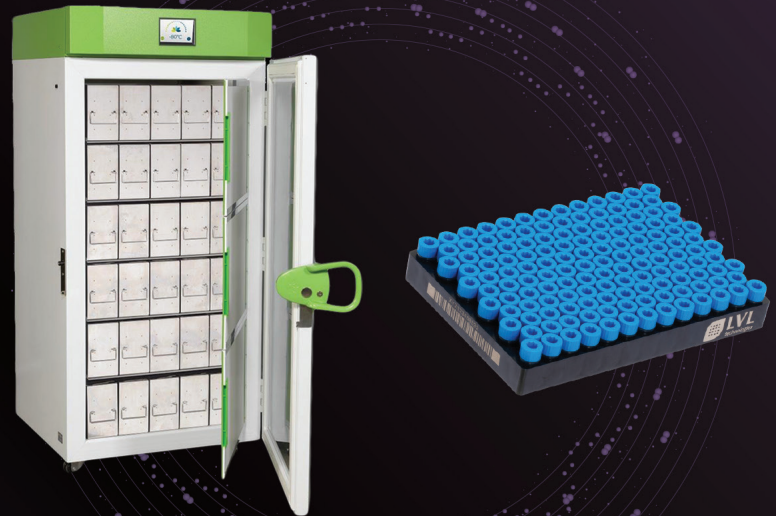


Sustainable and Cost-Efficient Sample Storage



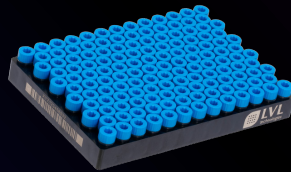
Contact our LVL technologies
Product Specialist to learn more:
enquiriesuk@calibrescientific.com

With LVL technologies SBS 2D tube racks and Stirling Ultracold ULT Freezers

The optimisation of storage processes and the use of environmentally friendly technologies are not only essential to protect the environment, but also for the long-term integrity and availability of biological samples.

Utilising storage tubes from LVL technologies in combination with an energy efficient ULT freezer can make a positive contribution to achieving these aims. The switch from conventional cryoboxes to LVL technologies SAFE® 2D tubes and racks makes sample storage in freezers much easier and safer, as well as more efficient and sustainable. Furthermore, by choosing an energy and space efficient freezer such as the Stirling Ultracold SU780XLE ULT freezer, organisations can reduce their energy usage and maximise their storage capabilities.

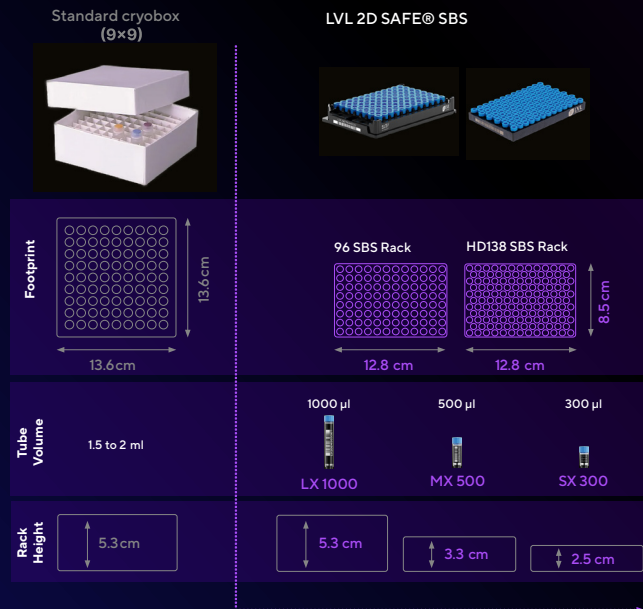
Store up to
231,840 samples
in one freezer!



Join the Space-Saving Revolution

Conventional cryoboxes are designed for volumes of at least 1-2 ml. In many cases, these volumes are not required, especially in the life science sector.

For these applications, LVL technologies offers tubes with 500 μ l or 300 μ l sample volume. And even for a sample volume of 1000 μ l, the storage space requirement is reduced thanks to the sophisticated rack and tube design. Space efficiency can be further increased by using LVL SAFE[®] SBS High Density (HD) racks.



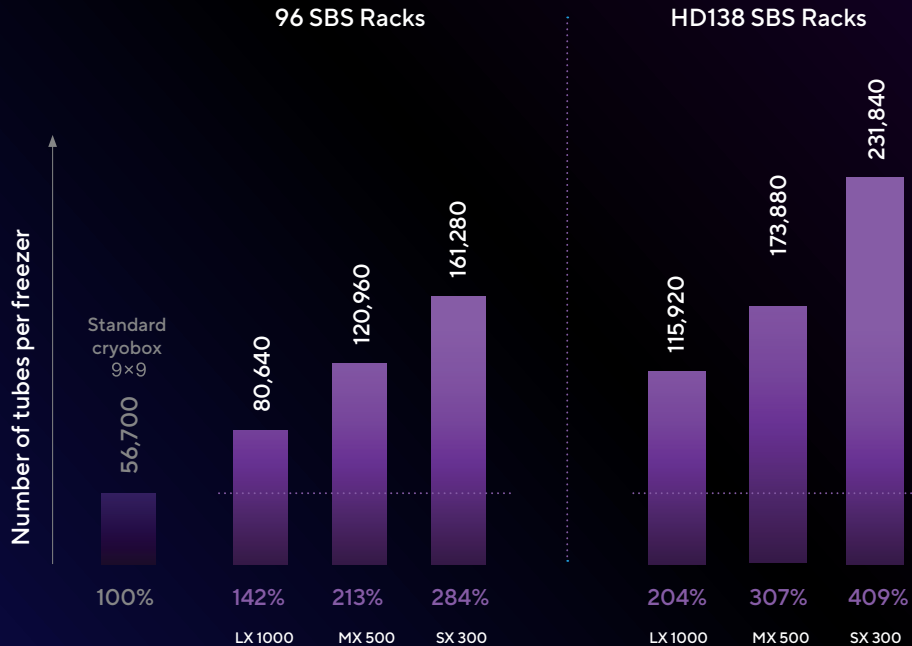
Increase storage capacity by up to 409% using LVL SAFE 2D tubes⁽¹⁾

(1) Based on LVL technologies SX 300 HD138 SBS Racks. See table 2).

Use Case

Optimise Storage Capacity

Switch from standard cryoboxes to LVL SAFE® HD138 SBS Racks.
Store up to 231,840 samples using SX300 2D tubes.⁽²⁾



Increase storage capacity by up to 409%

The Stirling Ultracold SU780XLE ULT freezer has a footprint of just 0.8m²

(2) See table 2) for full data.

Use Case

Reduce the number of freezers required for storing large sample quantities:

Reducing the number of freezers required by using LVL SAFE® 2D storage tubes significantly reduces ongoing electricity consumption and carbon emissions.

Save valuable laboratory space:

- Store up to 231,840 samples in only one Stirling Ultracold SU780XLE ULT freezer.

Make Further Energy Savings

By increasing the temperature of the Stirling Ultracold ULT freezer to setpoint -70°C could save more than 700 kWh/year, which is equivalent to running up to two energy efficient laboratory fridges or a -20°C freezer for a year! ^(4,5)

Increase freezer temperature from setpoint -80°C to -70°C :



Save up to £177 in running costs per year per freezer



Save up to 786 kWh/year



Save up to 162.80 kg CO₂e per freezer

**Run 1 freezer
rather than 4!**



**Use 0.8m² instead
of 3.18m² laboratory
floor space⁽³⁾**

(3) Freezer footprint: DxW: 870 x 915mm; 0.80 m²

(4) STIRLING ULTRACOLD SU780XLE - Green Light Laboratories 2022.

(5) <https://www.medlinescientific.co.uk/sustainable-solutions/refrigeration/> See table 1) for full data.

Insights

Basic data used for calculations:

Capacity of standard cryoboxes per unit: 700

Energy consumption of freezer: 8.86 kWh/day @ -80 °C; 6.71 kWh/day @ -70 °C*

Freezer footprint DxW: 870 x 915 mm; 0.80 m²

Basic values of energy/cost calculation:

Electricity costs UK: £0.2252 per kWh/day**

Carbon emissions: 1 kWh = 0.207074 kg CO₂e***

Sources

Racking solutions supplied by Calibre Scientific.

*STIRLING ULTRACOLD SU780XLE – Green Light Laboratories: 2022. Full details available on request.

**Green Light Laboratories.

***<https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023>

Table 1) Calculation for Energy Usage

ULT Freezer: Stirling Ultracold SU780XLE ULT

Freezer Temperature Setpoint (°C)	kWh/day	Cost per year (£) (365 days)**	kWh/year*
-80	8.864	728.60	3235.36
-70	6.710	551.55	2449.15
Energy/cost savings	2.154	£177.05	786.21

Table 2) Calculation of storage capacities

ULT Freezer Temperature Setpoint: -80 °C

Storage Box/ Tube Type	Racking Solution	No. of Boxes	No. of Samples	Cost per Box (kWh/year)	Cost per Box per Year (£)	Cost per Sample (kWh/year)	Cost per Sample per Year (£)	% Increase in Storage Capacity	% Saving per Box (kWh/year)	
Standard 9x9" 2 Inch Cryoboxes	4xBH528/14T & 2XBH529/14NMT	700	56,700	4.62	1.04	0.057	0.013	—	—	
96 SBS Format Racks										
1ml LVL Tubes LX1000	AH948/4NMTM, 28 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	840	80,640	3.85	0.87	0.040	0.009	142%	-17%	
500 µl LVL Tubes MX500	AH948/6NMT, 42 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	1260	120,960	2.57	0.58	0.027	0.006	213%	-44%	
300 µl LVL Tubes SX300	AH948/8MT, 56 Boxes per rack 5 racks per shelf 6 shelves (30 total)	1680	161,280	1.93	0.43	0.020	0.005	284%	-58%	
HDI38 (High Density) Format Racks										
1ml LVL Tubes LX1000	AH948/4NMTM, 28 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	840	115,920	3.85	0.87	0.028	0.006	204%	-17%	
500 µl LVL Tubes MX500	AH948/6NMT, 42 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	1260	173,880	2.57	0.58	0.019	0.004	307%	-44%	
300 µl LVL Tubes SX300	AH948/8MT, 56 Boxes per rack, 5 racks per shelf 6 shelves (30 total)	1680	231,840	1.93	0.43	0.014	0.003	409%	-58%	
ULT Freezer Temperature Setpoint: -70 °C										
Standard 9x9" 2 Inch Cryoboxes	4xBH528/14T & 2XBH529/14NMT	700	56,700	3.50	0.79	0.043	0.010	—	—	
96 SBS Format Racks										
1ml LVL Tubes LX1000	AH948/4NMTM, 28 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	840	80,640	2.92	0.66	0.030	0.007	142%	-17%	
500 µl LVL Tubes MX500	AH948/6NMT, 42 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	1260	120,960	1.94	0.44	0.020	0.005	213%	-44%	
300 µl LVL Tubes SX300	AH948/8MT, 56 Boxes per rack 5 racks per shelf 6 shelves (30 total)	1680	161,280	1.46	0.33	0.015	0.003	284%	-58%	
HDI38 (High Density) Format Racks										
1ml LVL Tubes LX1000	AH948/4NMTM, 28 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	840	115,920	2.92	0.66	0.021	0.005	204%	-17%	
500 µl LVL Tubes MX500	AH948/6NMT, 42 Boxes per rack, 5 racks per shelf, 6 shelves (30 total)	1260	173,880	1.94	0.44	0.014	0.003	307%	-44%	
300 µl LVL Tubes SX300	AH948/8MT, 56 Boxes per rack, 5 racks per shelf 6 shelves (30 total)	1680	231,840	1.46	0.33	0.011	0.002	409%	-58%	



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