

Orbital Shaken Bioreactors: The Scale Up Fast Track (from mL to 2500L)

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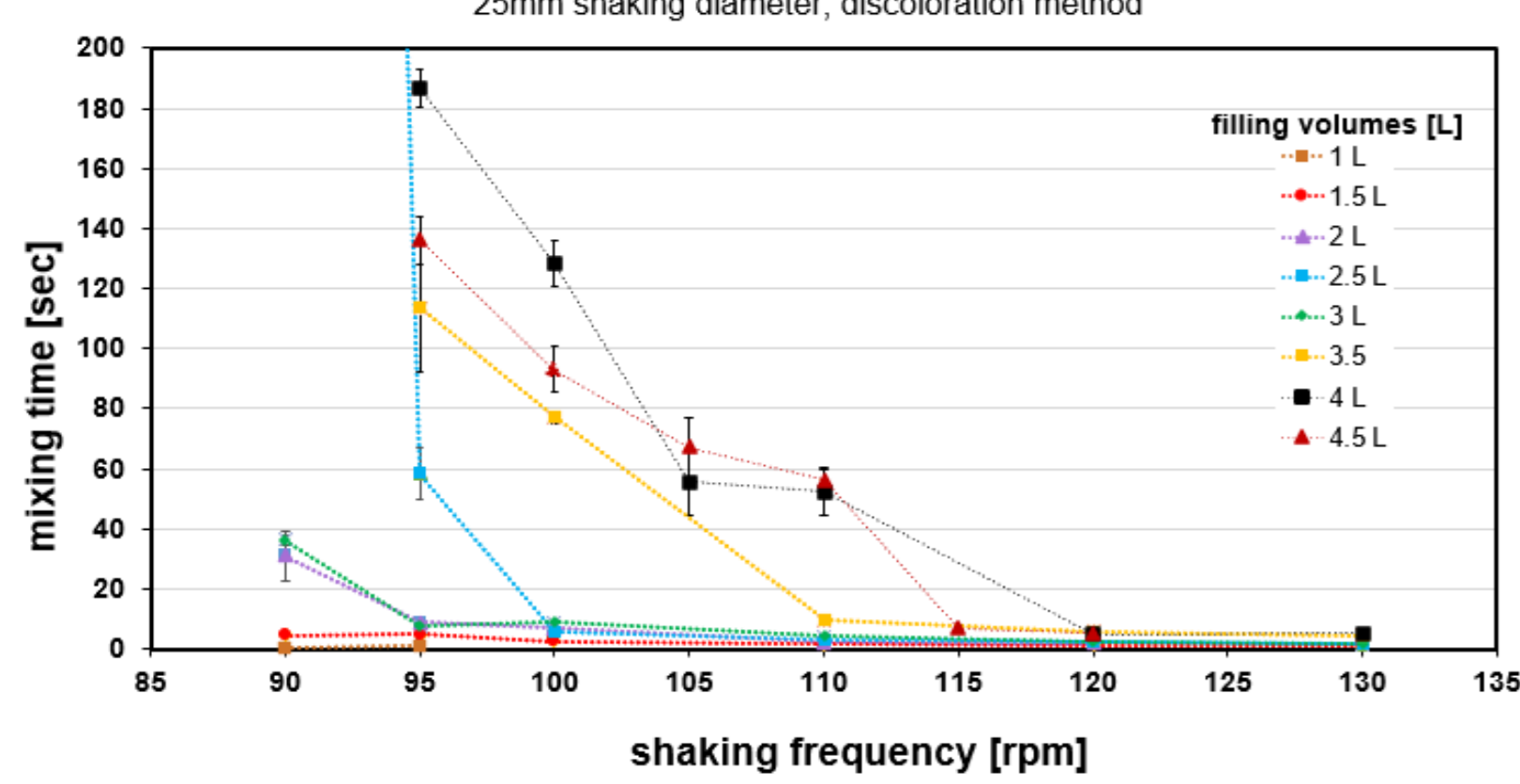
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Commercial-scale production of therapies requires scale-up from small scale to large scale for delivery of product to market. Here, orbital shaken bioreactors are presented as an alternative to stirred-tank vessels for process development and scale-up. Orbital shaken bioreactors offer a low shear and technically conservative approach capable of preserving mixing hydrodynamics from the μ l stage to scales as large as 2500L. The speed of scale-up is fast and the cost of implementation is low in comparison to stirred systems. k_La 's and mixing times for scales from 3L to 2500L are presented here.

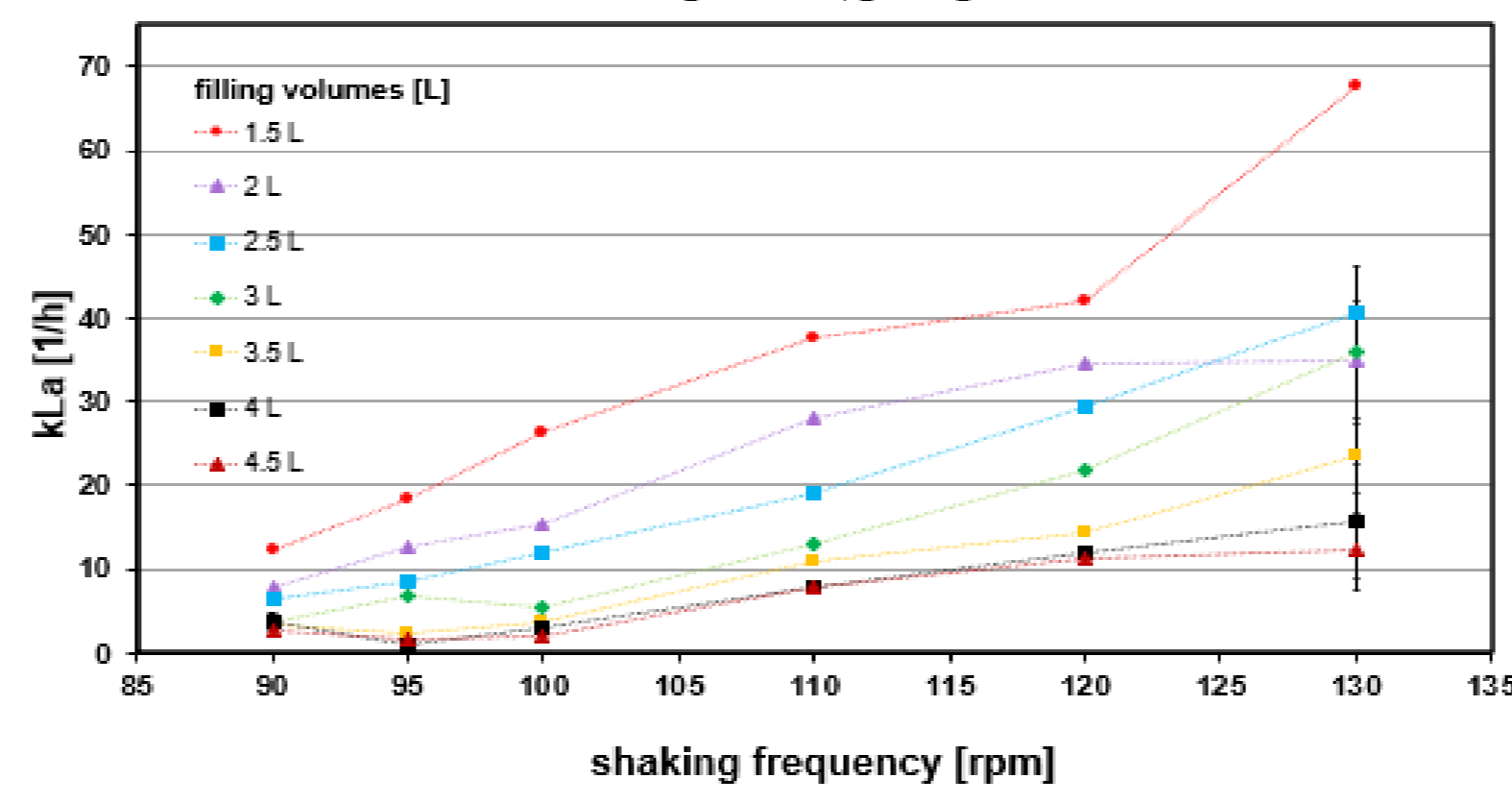
mixing

k_La

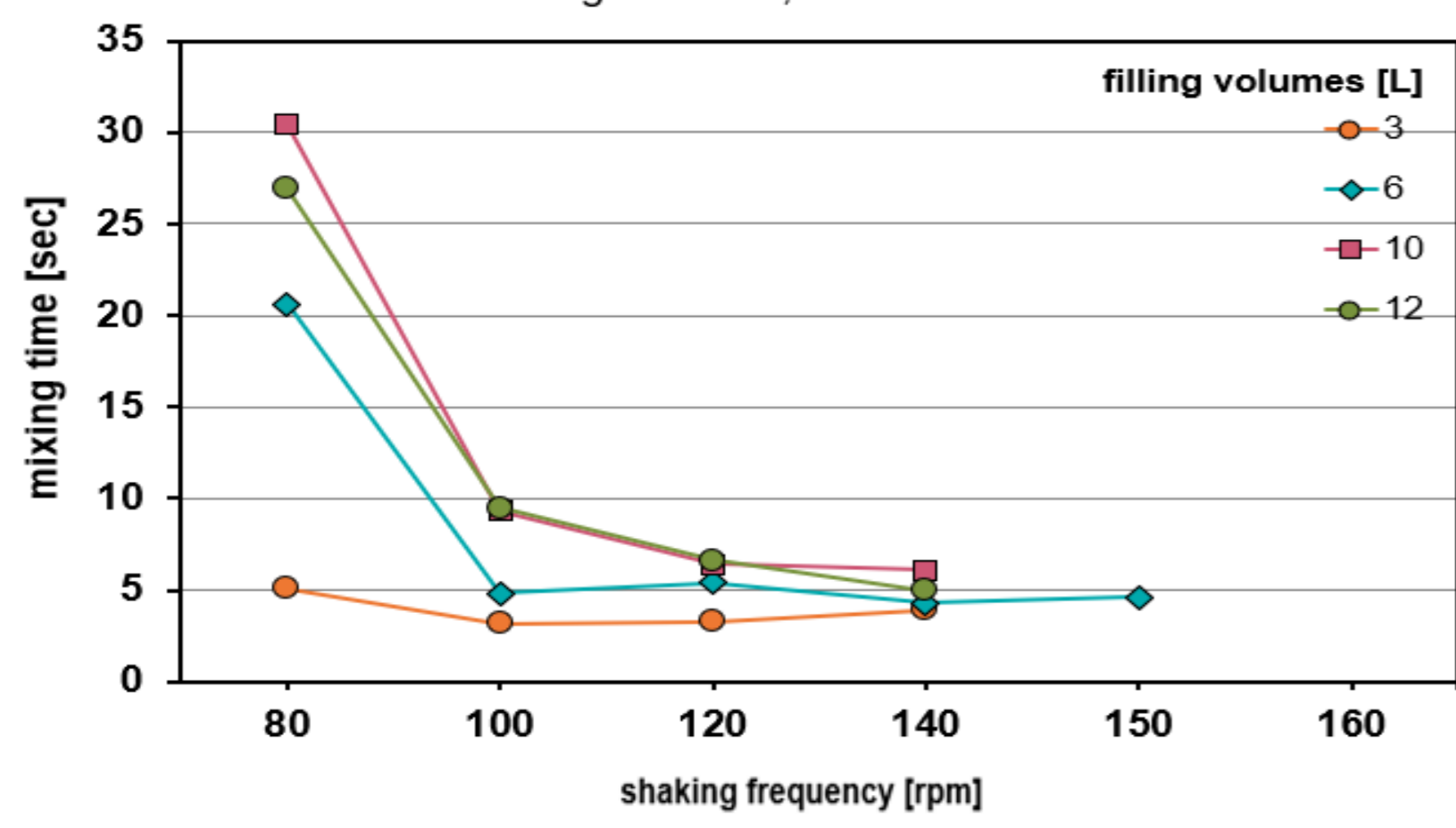
Mixing time in the SB10-X with 3L vessel module



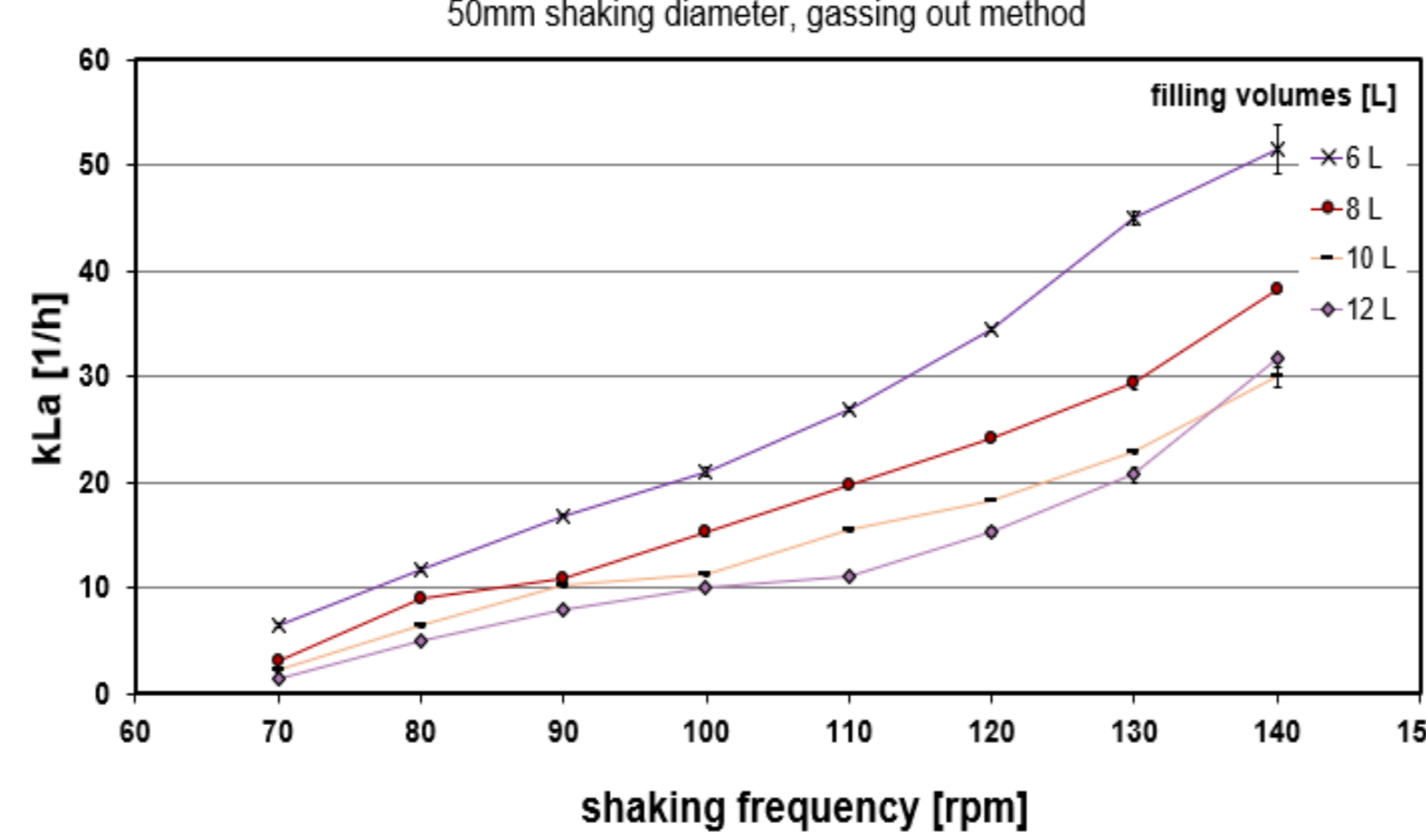
k_La in the SB10-X with 3L vessel module



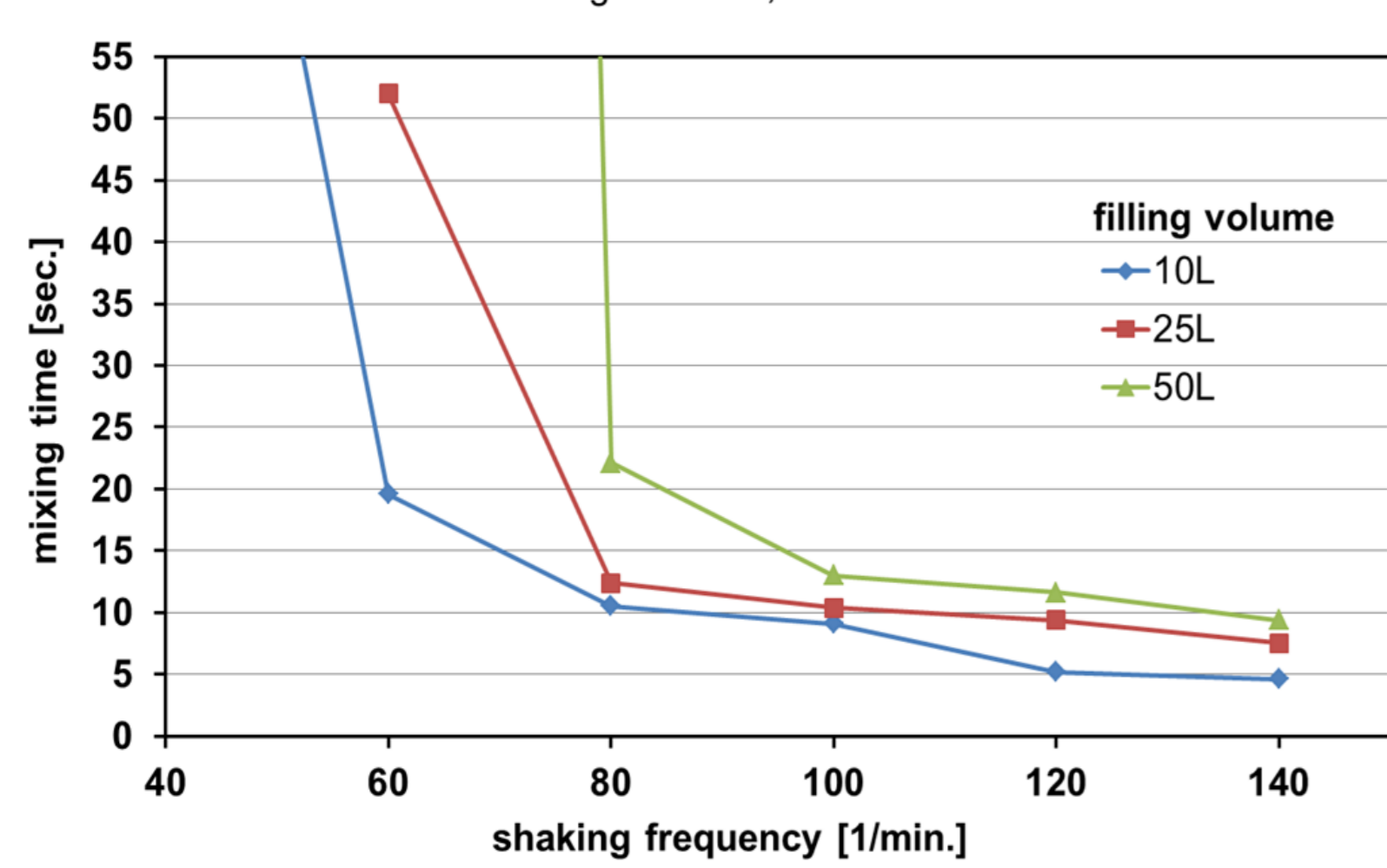
Mixing time in the SB10-X



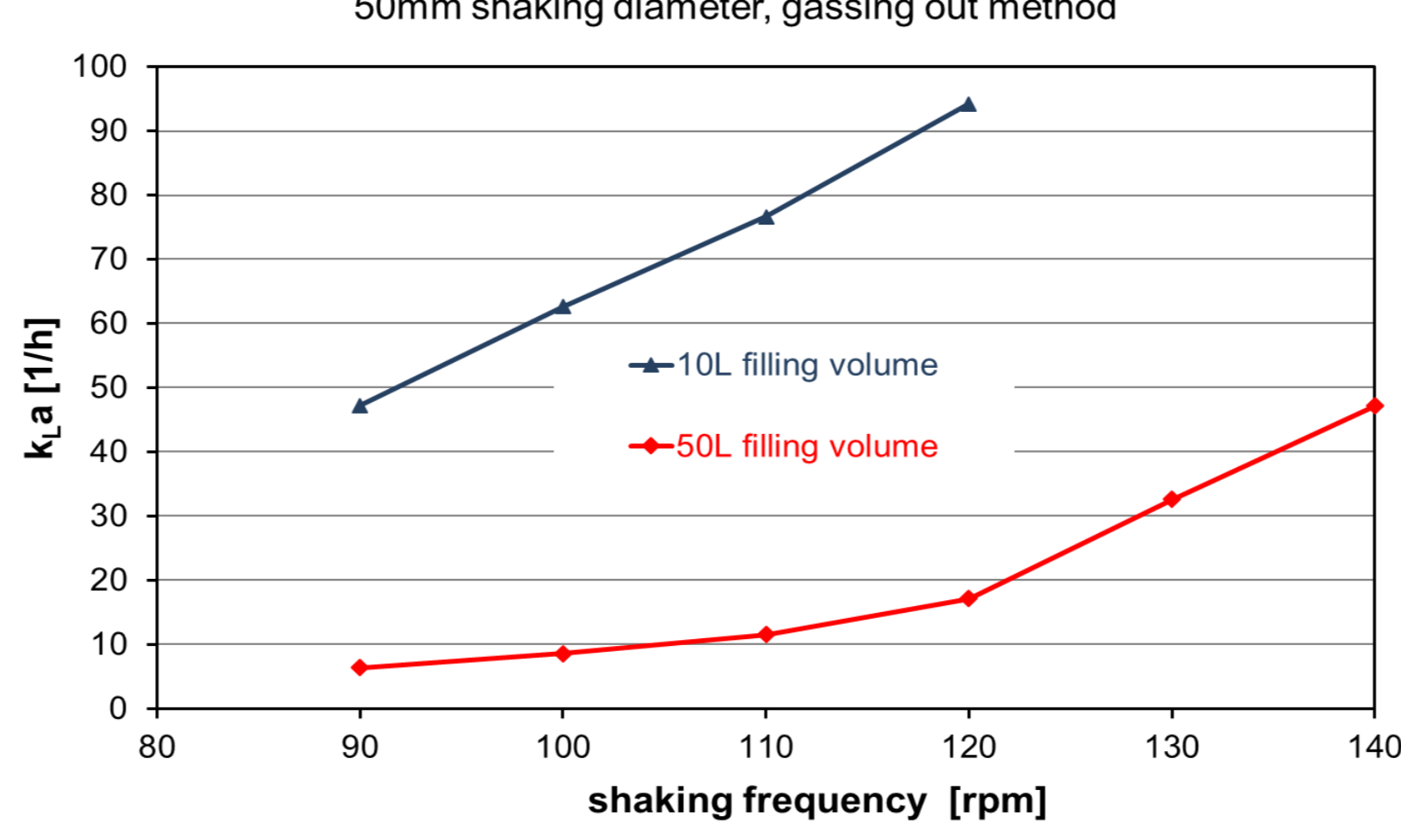
k_La in the SB10-X



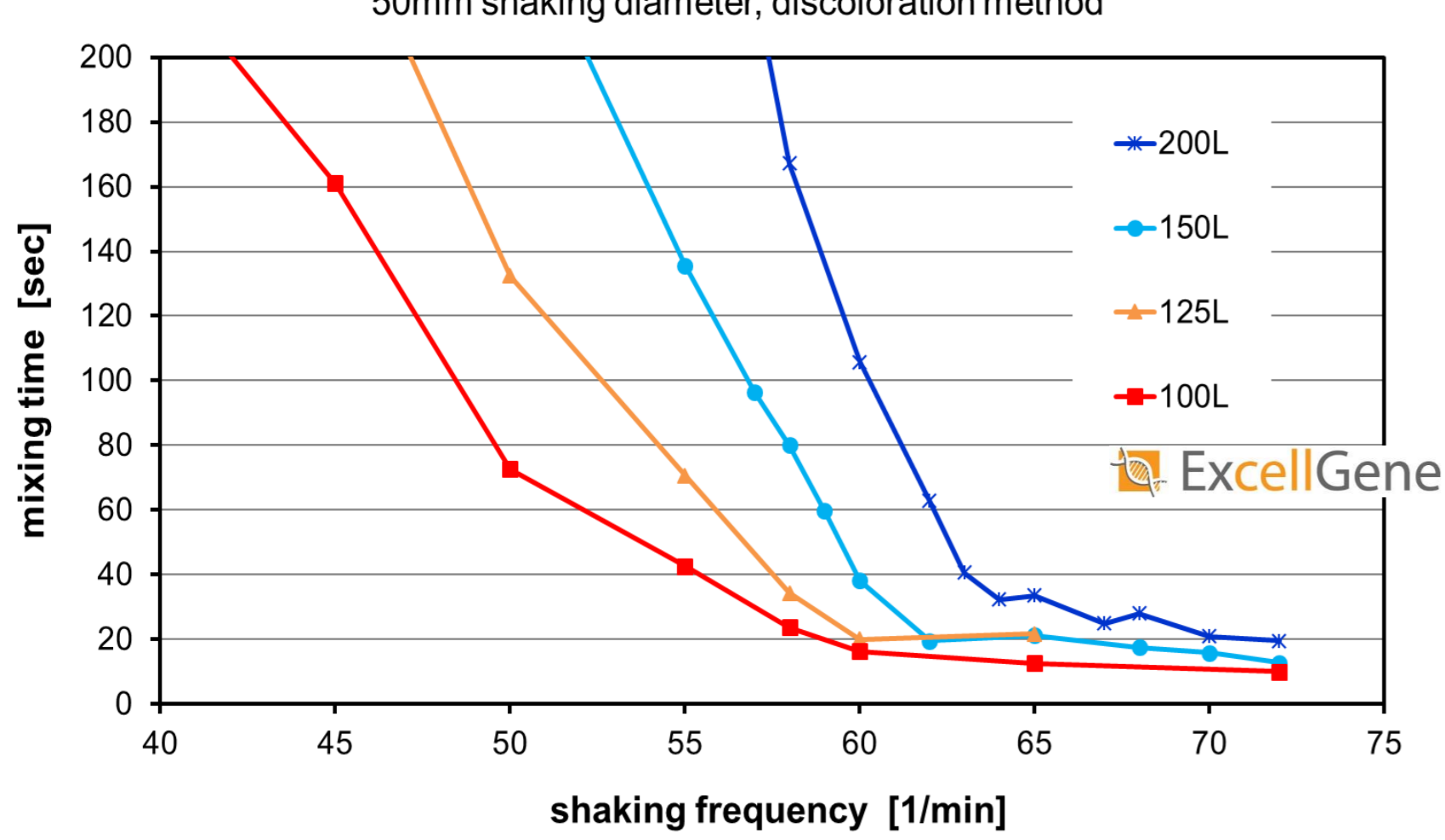
Mixing time in the SB50-X



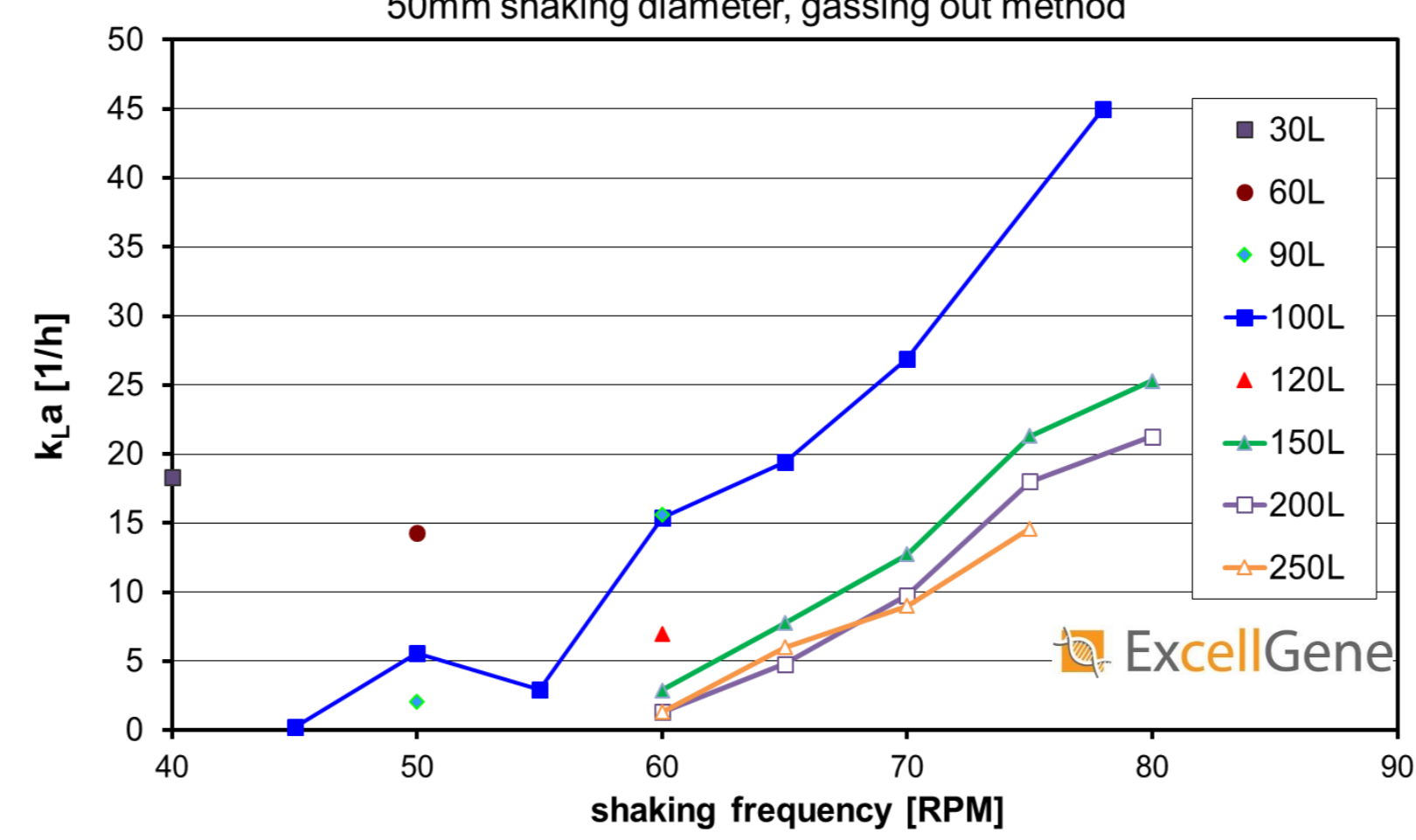
k_La in the SB50-X



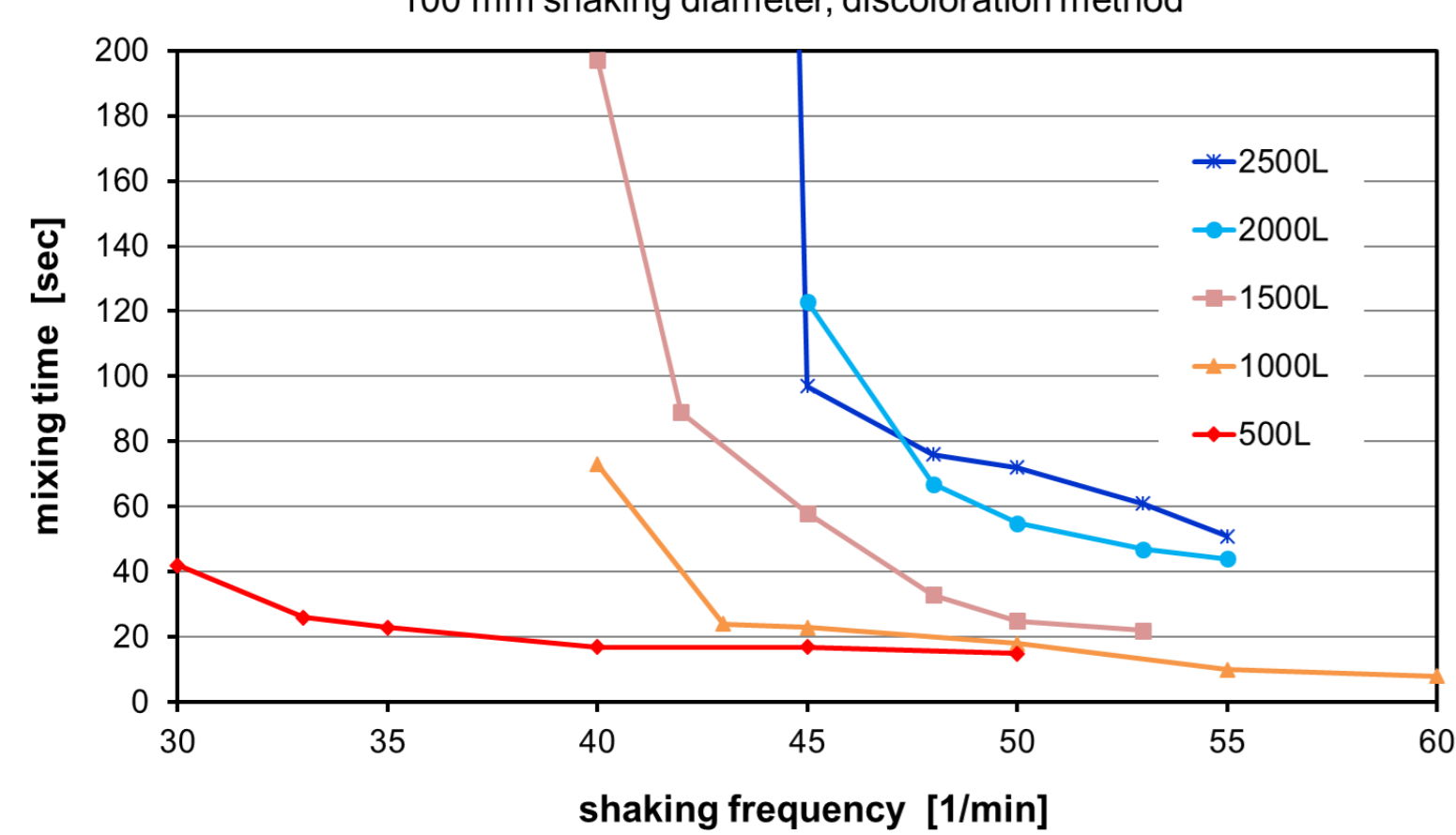
Mixing time in the SB200-X



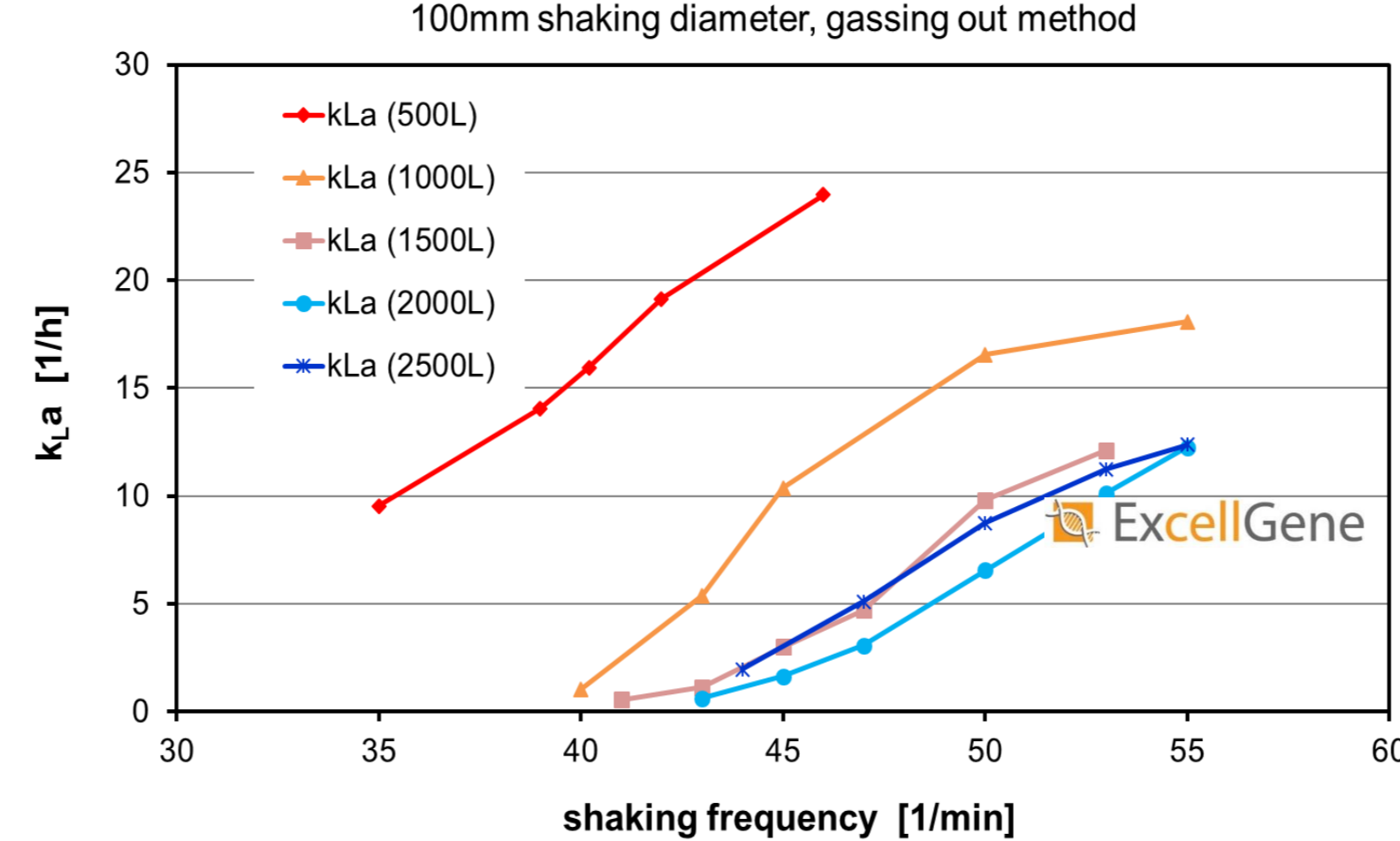
k_La in the SB200-X



Mixing time in the SB2500-X



k_La in the SB2500-X



SB10-X with 3L-Vessel module: 1.5L – 12L



SB50-X: 15L – 50L



SB200-X: 50L – 200L



SB2500-X: 500L – 2500L

- Orbital shaken bench-scale experiments scale well to 2500L.
- Mixing times and k_La data are available at each scale.
- All scales allow sensors for process monitoring.
- Simple 'no-impeller' bag is low cost and flexible.

