LIPEX® Flow Thermobarrel Extruder packages

OVERVIEW
LIPEX® Flow Thermobarrel Extruders are the industry-leading bench-top extruders for R&D and cGMP manufacturing of liposomal formulations in both academia and industry.

The innovative and patent-pending design maximizes the effective filtration area, resulting in lower extrusion pressures and high-flow processes. This translates to increased throughput, a wider formulation application range, faster processing times, and minimized process risks.

1. HIGH THROUGHPUT
2. WIDE OPERATING RANGE
3. FAST PROCESSING TIME
4. MINIMIZES PROCESS RISK
5. 6X INCREASE IN EFA*
6. 3X INCREASE IN MAOP**
7. UP TO A 50 % DECREASE IN REQUIRED EXTRUSION PRESSURE COMPARED TO PREVIOUS LIPEX® MODELS (individual results will be formulation and process dependent)

*EFA = Effective Filtration Area  **MAOP = Maximum Allowable Operating Pressure

The units are designed to produce a homogenous population of large unilamellar vesicles from a non-homogeneous population of multi-lamellar vesicles. The unilamellar vesicles are formed by utilizing a constant pressure force of between 100 and 2400 psi to force the vesicles through filters of a predefined pore size. These units have a maximum operating pressure and temperature of 2450 psi and 80 °C, respectively. The side walls of the thermobarrel and filter support are jacketed to provide efficient temperature control of the extruder for optimal size reduction results.

PACKAGE CONTENTS
- (1x) LIPEX® Flow Thermobarrel Extruder
- (1x) Package of polyester drain discs (100/pack)
- (1x) Package of polycarbonate filters with 100 nm pore size (100/pack)
- (1x) Spare O-ring set
- (1x) High pressure nitrogen line
- (1x) Turnover package USB
  - Operating manual
  - Declaration of conformity
  - Certificate of inspection & testing
TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>LIPEX® Flow Model</th>
<th>10 mL</th>
<th>100 mL</th>
<th>1000 mL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MAOP</strong>&lt;sup&gt;*&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· psig</td>
<td>2450</td>
<td>2450</td>
<td>2450</td>
</tr>
<tr>
<td>· bar</td>
<td>170</td>
<td>170</td>
<td>170</td>
</tr>
<tr>
<td><strong>MAOT (°C)</strong>&lt;sup&gt;**&lt;/sup&gt;</td>
<td>80</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Min. Extrusion volume</td>
<td>1 mL</td>
<td>20 mL</td>
<td>100 mL</td>
</tr>
<tr>
<td>Max. Extrusion volume</td>
<td>10 mL</td>
<td>100 mL</td>
<td>1000 mL</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>3</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>Material</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>· Body</td>
<td>316L Stainless steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>· O-Ring</td>
<td>EPDM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface finish</td>
<td>Mechanically finished</td>
<td></td>
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</tr>
</tbody>
</table>

<sup>*</sup>MAOP = Maximum Allowable Operating Pressure  <sup>**</sup>MAOT = Maximum Allowable Operating Temperature

REQUIRED ANCILLARY EQUIPMENT/SUPPLIES

The following is a list of commonly used ancillary equipment and materials required for efficient operation of the extruder.

- polyester drain disc (included)
- polycarbonate filter (included)
- heated re-circulator
- high pressure gas cylinder (nitrogen)
- gas regulator with a minimum delivery pressure of 2500 psi

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LIPEX® Flow – reg. trademark of Evonik Industries AG and its subsidiaries

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