MONOSTAGE LIQUID/LIQUID CENTRIFUGAL CONTACTORS
MODEL BXP

FOR SOLVENT EXTRACTION
OR LIQUID / LIQUID SEPARATION

TYPES OF APPLICATIONS:
- PHARMACEUTICALS: Purification of active principles (e.g. Antibiotics).
- CHEMICALS: Washing (e.g. polymers) or Extraction (e.g. Acetic acid).
- FOOD INDUSTRY: Purification of food components (e.g. Lactic and Citric acids)
- HYDROMETALLURGY: Separation or purification (e.g. Precious metals)
- VARIOUS INDUSTRIES: Perfumes, aromas, essential oils, ....

COMMON FEATURES OF ROUSSELET ROBATEL
CENTRIFUGAL EXTRACTORS AND SEPARATORS:
- Direct motor coupling to the main shaft.
- No bottom bearing in process area.
- Unique all-fluoropolymer construction for corrosive applications.
- Optional CIP systems for cGMP applications.
- Optional pharmaceutical grade polishing.
- Centrifuges perfectly adapted to both batch and continuous operations.
- Short retention time and low liquid hold-up.
- Efficient phase separation utilizing centrifugal force
- Various agitator designs to accommodate a wide range of solvent systems
- Low mix turbines for shear sensitive applications.
- Unattended operation.
- High throughputs achieved in compact unit.
- High extraction efficiency due to thorough mixing.
- Each extractor corresponds to a theoretical extraction stage.
- Rapid operational equilibrium
- Internal recycling of heavy or light liquid phase.
- Can serve as liquid/liquid separator and/or liquid/liquid extractor.
- Possibility to connect several BXP in series (no inter-stage pumps required) to achieve the required number of stages.
EXTRACTION CONFIGURATION

2 stage battery for counter-current extraction

OPERATING PRINCIPLE:

When operating as a centrifugal extractor for performing liquid/liquid extractions, a feed solution, containing one or more solutes (shown in yellow), and an immiscible solvent (shown in purple) with a different density than that of the feed solution are fed to the mixing chamber located on the bottom of the centrifuge housing.

A rotating agitator disc mixes the two immiscible liquids into a dispersion (shown in green). Different agitator disc designs can be used depending upon the liquids’ interfacial tension. The efficient mixing creates a large interfacial area between the two liquids to ensure maximum mass transfer of the solutes.

The dispersion is aspirated into the centrifuge bowl by a turbine located on the bottom of the rotating bowl. The liquids are separated by the centrifugal force generated by the rotating bowl. The heavier liquid (shown in yellow) occupies the outer portion of the bowl. The light liquid (shown in purple) occupies the inner portion of the bowl. The position of the liquid/liquid interphase is regulated by a heavy phase weir. Interchangeable heavy phase weirs of different diameters accommodate a wide range of density ratios. The heavy phase underflows to a static receiving chamber. The light phase overflows to a separate static receiving chamber.

The liquids are discharged by gravity to the next BXP centrifugal extractor or to downstream equipment. For multi-stage extraction processes, BXP centrifugal extractors can be installed in series to provide the required number of stages. No inter-stage pumps are required between the extractors.

The external inter-stage piping allows liquids to be fed into or routed out of the extraction process (main extraction, scrubbing, back extraction) as required for optimum flexibility.
SEPARATION CONFIGURATION

OPERATING PRINCIPLE:

When operating as a liquid/liquid centrifugal separator, a mixture of two immiscible liquids (shown in green) with different densities is fed to the pumping chamber located on the bottom of the centrifuge housing.

The liquid/liquid mixture is aspirated into the centrifuge bowl by a pumping turbine located on the bottom of the rotating bowl. The liquids are separated by the centrifugal force generated by the rotating bowl. The heavier liquid (shown in yellow) occupies the outer portion of the bowl. The lighter liquid (shown in purple) occupies the inner portion of the bowl.

The position of the liquid/liquid interphase is regulated by a heavy phase weir. Interchangeable heavy phase weirs of different diameters accommodate a wide range of density ratios. The heavy phase underflows to a static receiving chamber. The light phase overflows to a separate static receiving chamber. The liquids are discharged by gravity to downstream equipment.
## METALLIC CONSTRUCTION:
ROUSSELET ROBATEL liquid/liquid centrifuges can be fabricated from a variety of alloys such as 316L stainless steel, 904L stainless steel, Hastelloy C and other materials of construction (upon request, and upon mechanical compatibility). If used as extractors, these machines can be installed on single or common frames and are interconnected with flexible inter-stage piping.

### MONOSTAGE CENTRIFUGES FABRICATED FROM METAL.

<table>
<thead>
<tr>
<th>Model</th>
<th>Ø (mm)</th>
<th>Useful capacity (l)</th>
<th>Rotor speed (RPM)</th>
<th>Nominal flow rate (l/h)</th>
<th>Motor power (kW)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>50 Hz</td>
<td>60 Hz</td>
<td>50 Hz</td>
<td>60 Hz</td>
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<tr>
<td>BXP040</td>
<td>40</td>
<td>0,11</td>
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<td>3600</td>
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<td>12000</td>
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<tr>
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<td>970</td>
<td>870</td>
<td>60000/80000</td>
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</tbody>
</table>

The hourly flowrates depend upon the viscosity, emulsification tendency, density ratio and flow ratio of the liquids being processed.

## PVDF CONSTRUCTION:
Unique construction in which all process contact surfaces are fabricated from PVDF. This construction is advantageous if the process materials are corrosive and it is not possible to use metallic construction. If used as extractors, these machines can be installed on single or common frames and are interconnected with flexible inter-stage piping.

### MONOSTAGE CENTRIFUGES FABRICATED FROM PVDF.

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<tr>
<th>Model</th>
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<td>1170</td>
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<td>580</td>
<td>60000</td>
<td>60000</td>
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</table>

The hourly flowrates depend upon the viscosity, emulsification tendency, density ratio and flow ratio of the liquids being processed.

## LABORATORY MODELS:
For performing feasibility tests with minimum quantities of material.

### LABORATORY MONOSTAGE CENTRIFUGES (Metallic construction only)

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<td></td>
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<td>60 Hz</td>
<td>50 Hz</td>
<td>60 Hz</td>
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<td>0,0190</td>
<td>8000</td>
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<td>10</td>
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</tr>
</tbody>
</table>

The hourly flowrates depend upon the viscosity, emulsification tendency, density ratio and flow ratio of the liquids being processed.

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