ROUSSELET ROBATEL
703 West Housatonic Street – Ste L15
Pittsfield, Massachusetts 01201-6616
manufacturing centrifuges and centrifugal extraction equipment

ROUSSELET ROBATEL MODEL BXP CENTRIFUGAL LIQUID / LIQUID SEPARATOR

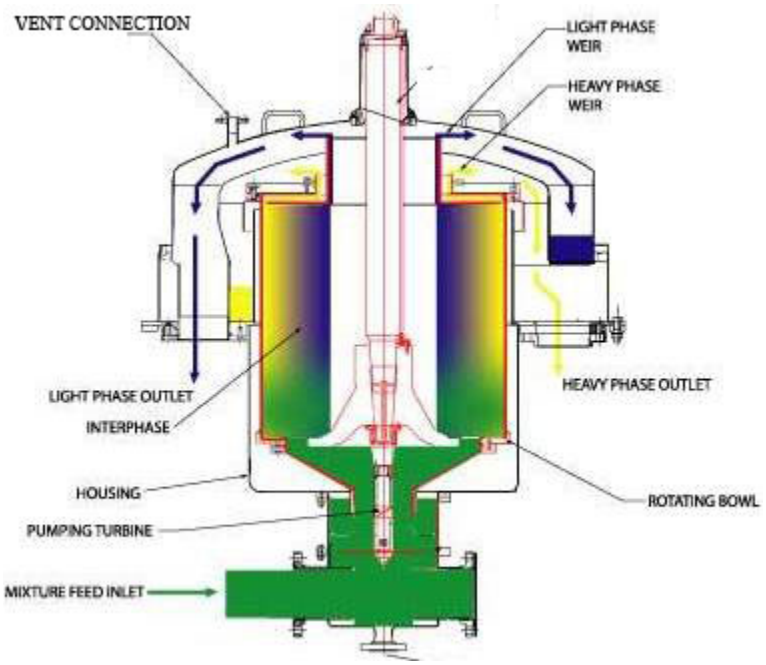

Figure 1: Model BXP liquid / liquid separation centrifuge

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 light liquid (shown in blue) 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. Low mix pumping turbines are available for shear sensitive applications.

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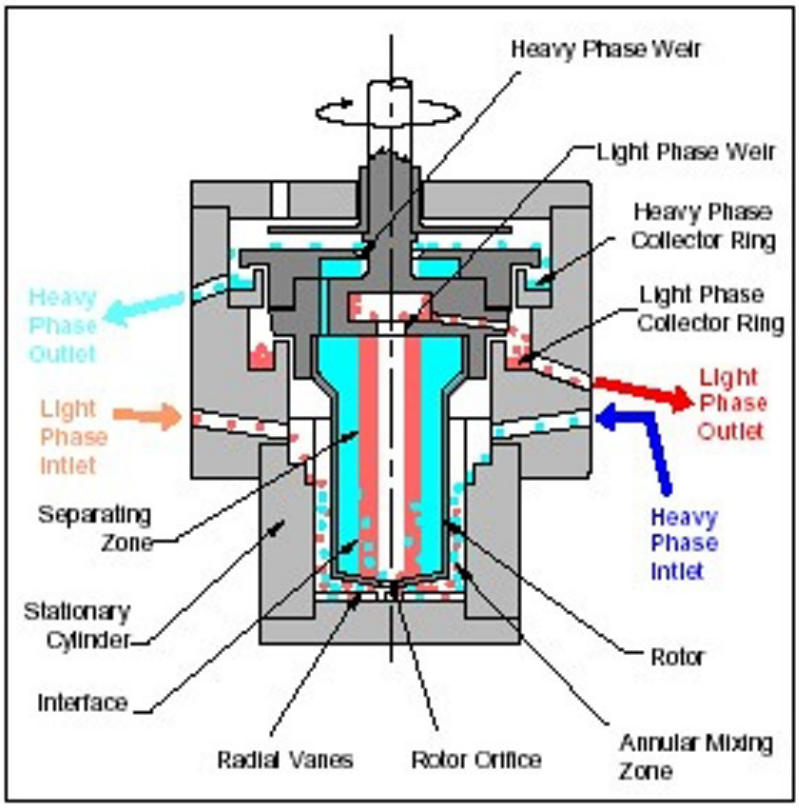

Figure 2: Annular centrifugal contactor design for low shear applications

We also offer annular centrifugal contactors as shown in Figure #2. The liquid / liquid mixture is fed to the annular zone between the rotating bowl and the static casing. The mixture is drawn into the bowl and separated under centrifugal force.

PILOT SCALE TESTING

For any liquid / liquid centrifugal separator, the maximum throughputs and separation ability can only be determined by testing the technology on a laboratory and pilot scale. The performance parameters of a liquid / liquid centrifugal separator will vary depending on the viscosity, temperature, density ratio, surface tension, and phase flow rate ratio.

Specifically, for a centrifugal separator, G-force and the mixing energy are important factors to consider during testing. As shown in the tables below, increased rotational speed provides a higher driving force for separation. However, as rotational speed increases, this will also increase the amount of shear imparted on the liquid / liquid system.

Therefore, the maximum rotational speed may not yield the best results. The shearing at higher speed may create a dispersion that is more difficult to separate. Typically, there is a “bandwidth” of rotational speeds that

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balances the right amount of mixing with adequate G-force for effective separation. By testing at several different rotational speeds on a pilot scale, this bandwidth can be quickly evaluated.

Rousselet Robatel BXP centrifuges can be equipped with low shear pumping systems for liquid / liquid systems with low surface tension that can be emulsive. The low shear pump consists of a cone that gently aspirates the liquids into the centrifuge bowl.

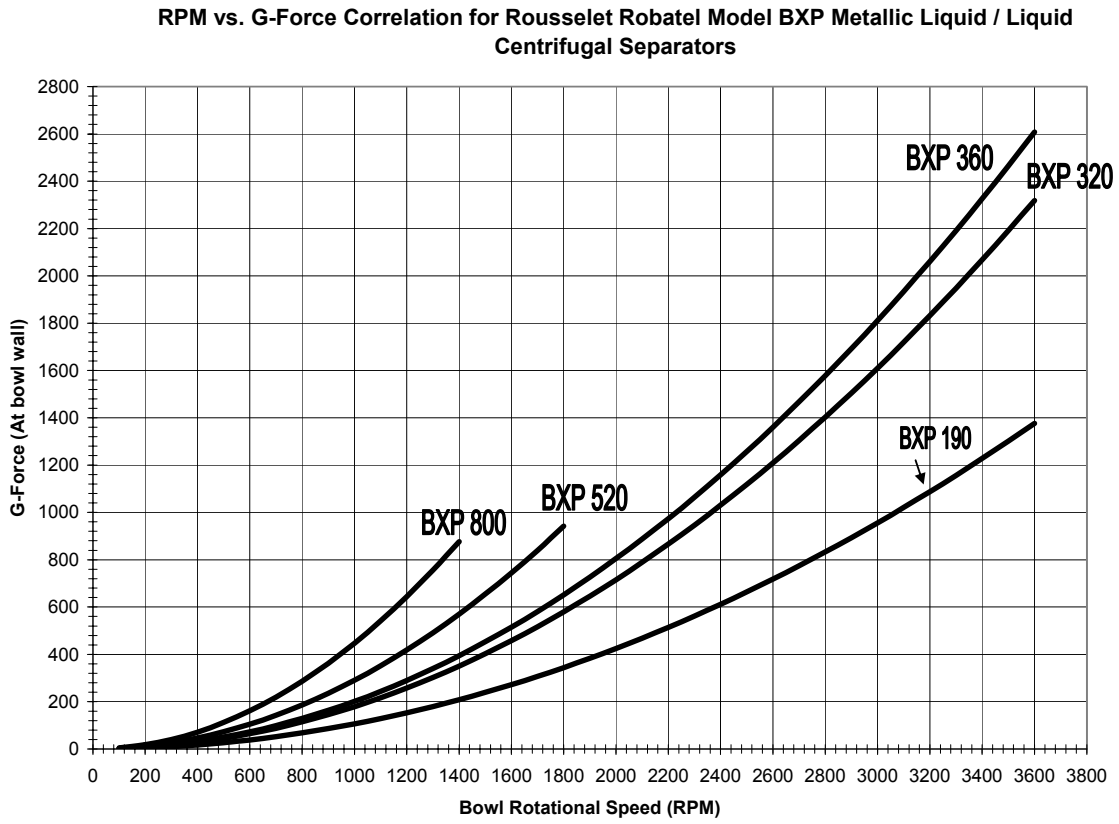

Figure 3: G-force vs. rotational speed for BXP metallic models

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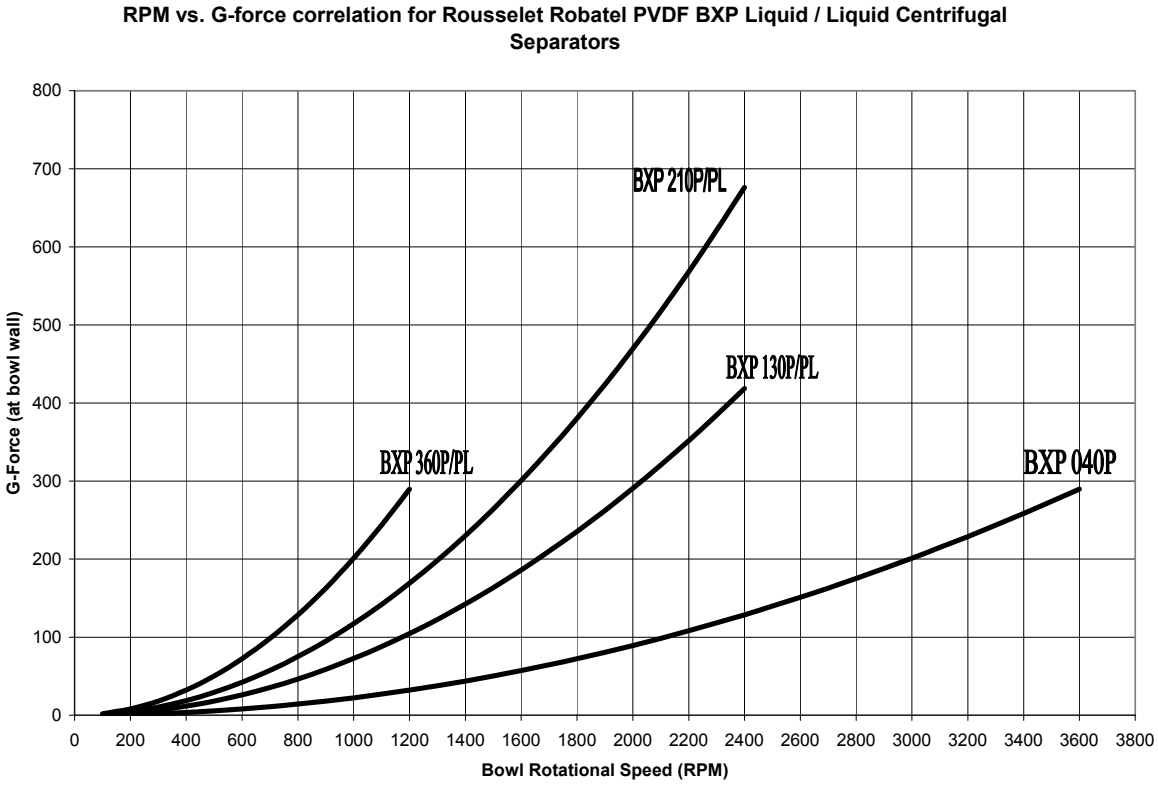

Figure 4: G-force vs. rotational speed for BXP Kynar models