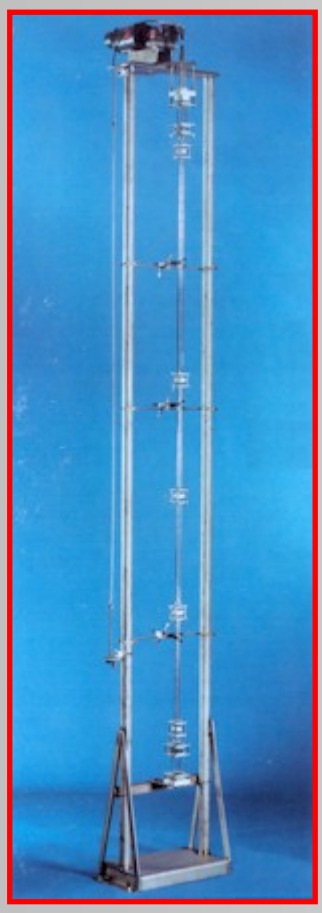
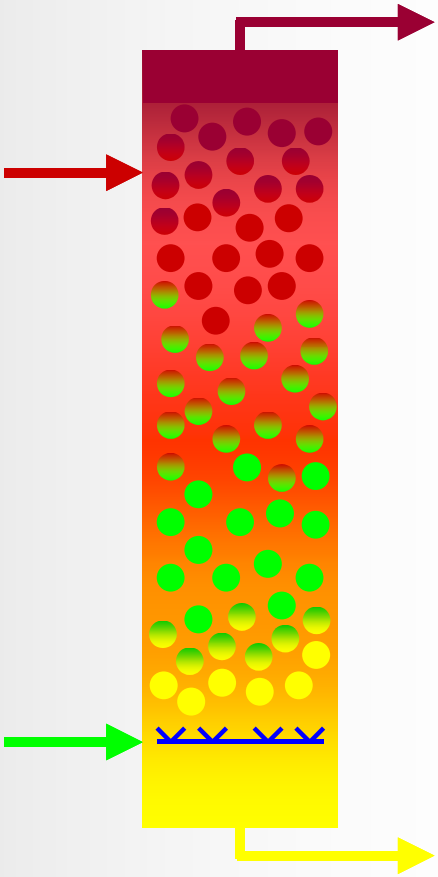
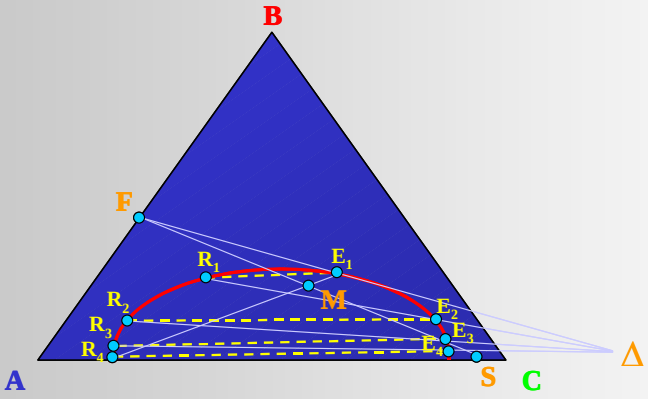
Extraction Technology Group

Liquid-Liquid Extraction Column Design
KARR®, SCHEIBEL® and More – Complete Modular Systems



Pilot Extraction Columns





K·M·P·S

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INTRODUCTION

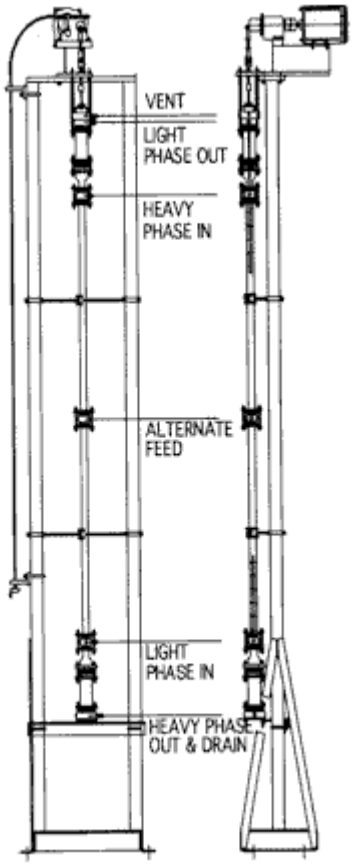
Design of liquid-liquid extraction (LLE) equipment with any reasonable degree of accuracy remains very difficult without some type of pilot plant testing. This is due to the complexity of the process taking place within an extraction column, e.g. droplet breakup and coalescence, mass transfer, axial mixing, and the fact that small amounts of impurities can dramatically affect performance.

KMPS offers a broad range of laboratory and pilot plant liquid-liquid extraction equipment to assist you during feasibility studies, process development and equipment design stages of your project. The picture to the right shows a pilot scale extraction column.

Our equipment is available on either a sale or rental basis and includes the following:

- Laboratory scale extraction columns to screen solvents, evaluate feed variables and determine the feasibility of liquid-liquid extraction for specific applications.
- Small pilot scale columns (static and dynamic designs) to optimize the extraction parameters for scale up to commercial equipment.
- Large pilot columns for semi-works or small scale production facilities.
- Portable units, which can be rented for testing on site.

KMPS can provide trained service personnel to assist you in installing the pilot extraction column at your facility. KMPS is also available to help you set up an effective pilot plant test procedure and will work with you to interpret the test results and apply them to the design of your commercial column.



Pilot Scale KARR® Column

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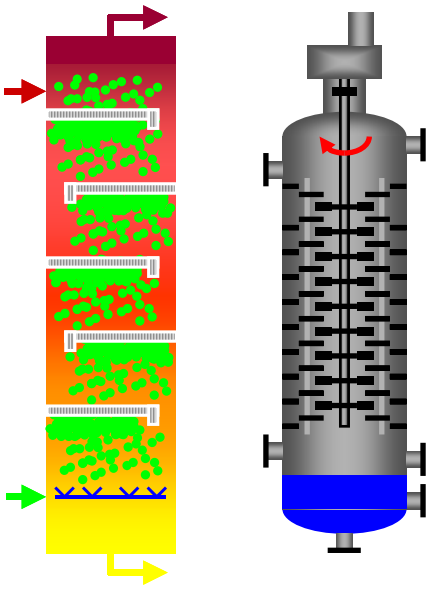
PILOT EXTRACTION COLUMNS

Agitated Columns

KMPS offers a number of agitated liquid-liquid extraction columns. These columns are normally provided with a borosilicate glass shell for observation of the process. Such observation is critical for optimization of the column performance. The standard designs are the 1" diameter KARR® Reciprocating Plate Column and 3" diameter SCHEIBEL® and RDC columns.



Static Columns

KMPS also offers a 4" diameter static column packed with either SMV or SMVP extraction packing. This unique packing promotes good radial mixing while suppressing axial (back) mixing providing better plug flow characteristics and improving efficiency compared to random packing. The pilot column is offered with a glass shell (atmospheric pressure operation) and stainless steel shell (for operating at elevated pressures).

KMPS Pilot Plant

KMPS has a pilot plant located in Houston, TX dedicated to liquid-liquid extraction testing. Besides extraction we can also test the downstream distillation steps and develop entire process flowsheets.

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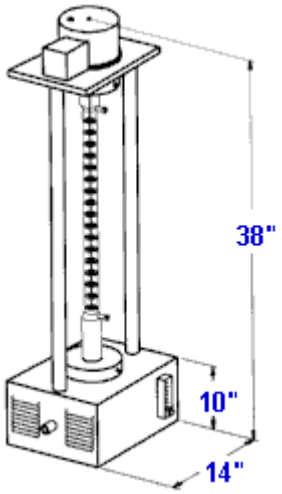
PILOT EXTRACTION COLUMNS

Bench Top KARR® Column



KMPS also offers a Bench Top KARR® Column that consists of a 5/8" diameter glass column with a 24" plate stack height. Two (2) plate stack assemblies are included (316SS and Teflon perforated plates and spacers) with 1/2" plate spacing. An air motor is provided to regulate the agitation in the column. The unit comes in a stainless steel frame as shown in the sketch to the left. KMPS has demonstrated that up to 2.7 theoretical stages per foot of agitated height can be achieved with this unit.

Extraction Screening Unit

Sometimes the nature of process materials being handled prohibits testing at our pilot plant. In these cases, KMPS can deliver portable units and operating personnel to the plant for on site testing. Such as our portable Extraction Screening Unit (ESU) ideally suited for this purpose, see picture to the right. This unit consists of a 3" diameter x 12 - 18 stage, SCHEIBEL® Column with glass shell and air drive motor. Two stainless steel tanks with sight glasses and rotometers for flow control are mounted with the column onto a portable frame. Powered by air or nitrogen, it is ideal for use in hazardous areas.

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