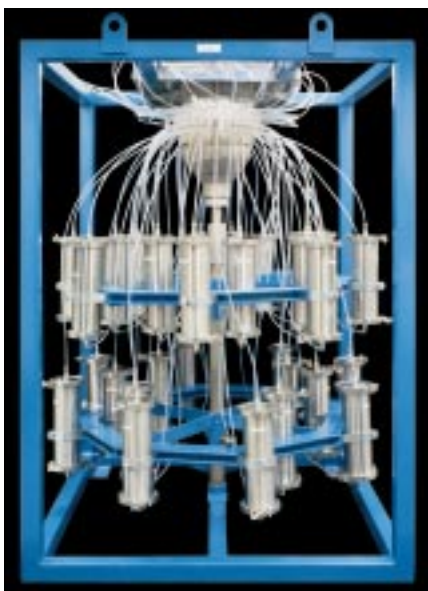


ISEP®/CSEP® L100C SERIES

Continuous Ion Exchange and Chromatography Technology For Small Production Scale and Pilot Operations

The L100C series offers compact, uncomplicated process technology to develop pilot and production scale systems.



Significant process enhancements are achieved with Calgon Carbon Corporation's continuous chromatography and ion exchange systems, including:

- Increase in yield
- Higher purity and concentration
- High sorbent utilization
- Significant reduction in chemicals and eluents
- Less waste

Advantages

- Continuous Ion Exchange
- Continuous Chromatographic Separations
- Multi-component Separations
- Steady State Operation
- Simple Mechanical Design
- Multi-component Streams
- High Configuration Flexibility
- Direct Scale-up to Production Unit
- Programmable Step Time
- Suitable for IX Resin and Other Adsorption or Separation Media

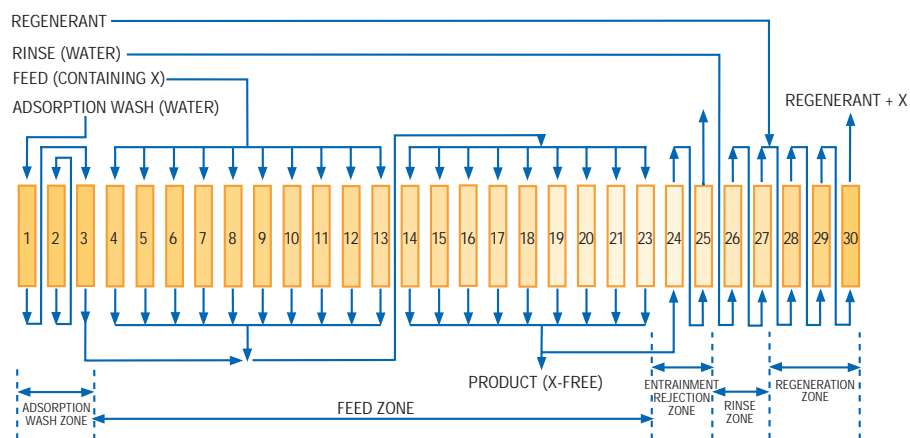
Applications

- Antibiotics, Vitamins
- Chiral Separations
- Nitrate Removal
- Mineral Processing
- Demineralization
- Decolorizing
- Amino Acids
- Nutraceuticals

Industries

- Sugar and Sweeteners
- Pharmaceutical/Biotechnology
- Hydrometallurgy
- Fine Chemicals
- Fermentation
- Water and Wastewater Treatment
- Bulk Organics and Inorganics

Continuous Ion Exchange Process Flow Diagram showing Parallel and Series Feed



Equipment and Systems

Visit our website at www.calgoncarbon.com, or call 800-422-7266 to learn more about our complete range of products and services, and obtain local contact information.

ISEP®/CSEP® L100C SERIES

Continuous Ion Exchange and Chromatography Technology For Small Production Scale and Pilot Operations

All models include:

- Distributor: Hastelloy C and Teflon
- Fittings and Tubing: PFA, Polypropylene or PEEK
- Columns: Glass, Polypropylene, CPVC, Teflon, Stainless Steel or PVDF
- Epoxy Coated Carbon Steel Frame
- Mobile Construction
- Construction Materials to Suit Applications



CCC's Pittsburgh pilot plant and laboratory.

Electrical Data

Power supply unit: 230 V, 3ø 60Hz,
or 220 V, 50Hz

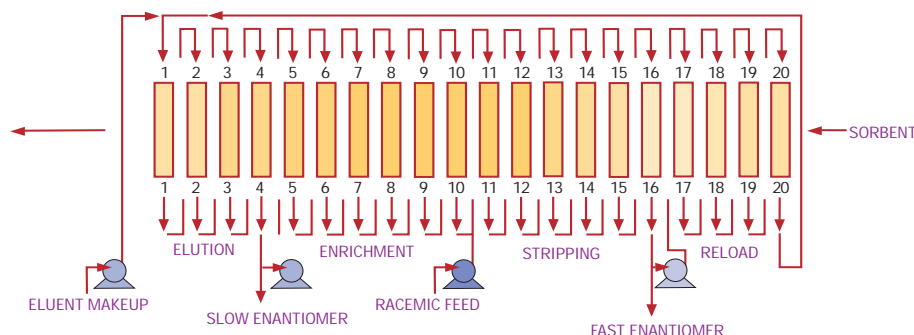
Step time: 15 sec. – 9999 sec.

Auxiliary Packages

- Equipment packages including pumps, instrumentation, heating/cooling, tanks, etc. are available upon request.
- Rental/lease and piloting services available.
- Toll manufacturing available.

Technical data	
Model	L120C/L130C
Number of Columns	20 or 30
Maximum Column Length	100 cm (39")
Fitting and Tubing Size	1/4" or 3/8"
Overall Height	225 cm (89")
Width	130 cm (51")
Depth	130 cm (51")
Weight	1100 kg (2425 lbs.)
Maximum Pressure	6 bar/87 psi
Maximum Temperature	120°C (248°F)
Flow Rates	0 to 1000 l/h (0-4.4 gpm)

CSEP® Chiral Separation Process Flow



1. Enrichment Zone – The feed is entrained in the voids of the sorbent. The feed column steps into the enrichment zone. One (slow) enantiomer adsorbs preferentially. The other (fast) enantiomer is washed forward by the eluent. The slow enantiomer increases in purity as the column steps across the enrichment zone.

2. Stripping Zone – Racemic feed enters along with eluent moving forward from the enrichment zone. The slow enantiomer is removed by the sorbent as the eluent moves across the zone. The fast enantiomer increases in purity.

3. Reload Zone – The fast enantiomer is removed at Port 16. A relatively small portion of that flow is sent forward to the reload zone. All of the fast enantiomer is carried back to the stripping

zone by the sorbent. This increases the concentration of the fast enantiomer. This zone also cleans up the eluent for re-use in the elution zone, reducing the amount of makeup eluent needed.

4. Elution Zone – The sorbent carries the slow enantiomer to the elution zone. A high flow of eluent in that zone removes the enantiomer from the sorbent as the cell steps across the zone. A portion of the flow is sent forward to the enrichment zone to effect the separation. The sorbent leaves the elution zone clean and ready to perform separation in the other zones.

5. Countercurrent flows – The efficiency of separation in each zone is enhanced by the countercurrent nature of the flows. The components encounter the sorbent multiple times because the sorbent moves counter to the eluent.

Visit our website at www.calgoncarbon.com



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