



LCC Engineering & Trading GmbH.

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Company Profile & Product List of LCC Engineering & Trading GmbH Spring 2015

LCC Technology AG was founded in 1995 as a **specialist in chromatography** and converted to **LCC Engineering & Trading GmbH by 1997**. In the meantime, we have advanced to an internationally known LC specialists. We are an independent private company, led by founder Irene & Willi Glettig.

Our mission is to offer the best and most competitive chromatography columns, consumables and advanced specialty systems, to offer competent technical service and customer training and to provide quick and uncomplicated delivery. (see http://www.chromatographyshop.com/html/our_services.html)

For us it is important to understand the needs and desires of our customers. Vice versa, we want to show our customers that we are better than our competitors.

The liquid and gas chromatography-industry is dominated by four to five giants that supply chromatography system. The rest of the suppliers consist of approximately 60 to 70 smaller, highly innovative specialty product providers who create unique analytical and prep chromatography solutions and novel applications so as to advance chromatography as a separation/purification technology. Unfortunately, industrial chromatography made little progress during the past 10 years.

The smaller specialists suppliers are mostly privately owned globally operating companies led by the founders. They all survive because they create unique products and have a deep understanding of market needs.

We sell approximately 90% of the LC products manufactured around the globe and develop together with partner specific productivity enhancing tools and equipment. We know most of our supplier partner personally for many years. Many made us to represent them as their sole-distributors in Switzerland or in Europe.

Specialty tools / equipment we sell application-focused, around the globe and if possible through our network partner.

Some selected customers are located in complex economies. To simplify purchasing the export marketing well and provide fast delivery combined with high quality technical service. Many of our clients are pioneers that permanently try to solve problems with new innovative products to improve their market value and safety.

As entrepreneurs, we don't have a job - we have a deep professional commitment to assist our clients on their path to success. Some customers are with us for the last 20 years. We accompanied them around the globe on their path into many new endeavors. Many of them are our friends with whom we have done a lot of pioneering work. This makes live so interesting.

In the fast-paced Internet age large quantities of orders are afflicted with errors. Clients must choose from a range of about 4 million items the appropriate one and often including the correct serial numbers. In such a large diversity mistakes happen. With LCC, all orders are checked and checked again to avoid frustrations. The same applies to application questions.

The internet is an infinitely large collection of data and information. People visit the Internet to quickly find answers for their application problems. What they find are publications or forums where they can ask questions. Problems always have a context. What they usually find are publications that trigger more questions. It is very difficult to find context related and validated know-how. Forums are a little better. Help from the forums is free of charge and therefore rather superficial.

Many customers call us to discuss their problem in context. Sometimes we are able to instantly provide very good solution. For more complex problems we contact our relevant business partners around the globe. They provide very quickly high quality answers. This is by far the fastest and best way, if you do not like surprises! Of course we help with commercial motives. We know that if our proposed solution solves your problem competitively you will return to procure our products. You can be sure that we evaluate different options. As independent operator this will assure you that we enable you with the very best and most productive solution. Don't hesitate, take advantage of this service

We are the official representatives of the following companies:

ACT manufactures **ACE columns**. ACE columns are among the **best columns on the market**. They are **very well packed and very popular** especially in the pharmaceutical industry. They show unparalleled reproducibility, efficiency, selectivity and column lifetime. ACE has a well structured product range with the following categories **Classic ACE for HPLC, ACE EXCEL for UHPLC and SFC, ACE SUPER for HPLC, UHPLC and SFC and ACE ULTRA CORE for HPLC and UHPLC** applications. ACE also produces **excellent Prep columns**. Thanks to serious research and development ACE has advanced to a leading column producer that fulfill all customer needs. http://www.chromatographyshop.com/html/ace_columns.html

AKZO CHEMICALS, manufacturers of **classic Kromasil, Kromasil UHPLC**, the new hybrid material **Kromasil Eternity XT** and very **stable Chiral materials**. Kromasil is well known to manufacture unique and highly stable silicate materials since many years. Kromasil separation materials are in great demand in the preparative and industrial chromatography. We provide only original columns and materials produced by AKZO
http://www.chromatographyshop.com/html/kromasil_akzo.html

Chiral Technologies is a leading global manufacturer of chiral polysaccharide columns. A wide range of products and training is offered. We help to find the best column choice for your application <http://www.chromatographyshop.com/html/daicel.html>

DIKMA Technologies, manufacturer of **Endeavorsil™** 1.8 micron UHPLC columns, **Leapsil™** 2.7 micron HPLC / UHPLC Columns, **Inspire™** fast separation materials supplying high resolution, **Spursil™** Polar-modified phases, **Bio-Bond™** columns for protein and peptide separations, **Platisil™** recommended for solvents with high water content. Dikma offers very good prep columns. In addition, a wide range of GC and SPE columns which include the world famous **ProElut™** **QuEChERS** kits. Page is under construction

DIAMOND ANALYTICS, a division of the large U.S. Synthetic was the first company to incorporate **nanotechnology with chromatography**. They produce "**Flare**" – a **Solid Core material**. On top of a non-porous carbon based solid carrier material with 3.4 um diameter is a 0,1 um thick highly crosslinked Polyallylamine matrix embedded with nano-diamonds. C18 and HILIC configurations are available. **Flare is a multimode solid phase**. Polyallylamines shows low ion exchange capacity. The materials exhibit **high chemical and thermal stability** and differs in their properties from polymer or silica-based materials. The Hydrophobic Subtractions Model clearly indicates that the RP properties compared to conventional RP are different. This column is ideal for use as orthogonal column.

http://www.chromatographyshop.com/html/diamond_analytics.html

EPROGEN, a manufacturer **non-porous silicate (NPS)**, **porous reversed phase (RP)**, **ion exchange and size exclusion columns**. Eprogen focuses on **bio-chromatography** and is working on a method to improve the **biomarker production**. (The web page is under construction)

Hichrom, was founded in 1978 and today regarded as the **largest and most famous LC / GC column packer**. In the earlier years Hichrom developed unique and stable **chiral chromatography columns**. They have taken over products from Beckmann (**Ultrasphere**) and HPLC products from Whatman / GE Healthcare (**Partisil & Partisphere**). In recent years Hichrom have built the **largest application database**. Hichrom issues every two to three years a very **popular product catalog** in which most known columns are listed and their properties well explained. Hichrom sells **fittings and other chromatography consumables**. They regularly **conduct training seminars** with famous chromatography popes such as Prof. Mel Eubry. <http://www.chromatographyshop.com/html/hichrom.html>

IMTAKT, highly innovative manufacturer of **Scherzo mixed mode HPLC columns** for easy separation of positively and negatively charged or neutral compounds in RP mode. 2014, they introduced the **first dedicated amino acids column for LC-MS** applications. **Presto FF-C18** is a non-porous 2 um RP material for the separation of peptides, proteins, synthetic organic polymers. **Intrada WP-RP** is a low polar, large pore RP column material for the separation of proteins. The **Cadenza** range is a high-resolution, low-pressure HPLC column material with different selectivities. **Unison UK** range are traditional RP columns. Imtakt is very successful in the separation of complex natural products

<http://www.chromatographyshop.com/html/imtakt.html>

MicroSolv Technologies,

MicroSolv Technologies, manufactures **Cogent columns**. These materials are based on **Silicahydrid or Silica Type-C**. The columns equilibrate very quickly and may be run in **Normal, Phase, RP or ANP** mode. They are easy to handle, use less solvent and are almost indestructible. Cogent columns are popular for metabolomic applications. Microsolv also offers various specialty and **chiral columns and neutrally coated CE columns**

http://www.chromatographyshop.com/html/cogent_microsolv.html

Many chromatographers are not aware that glass vial surfaces can turn into ion exchanger. Microsolv offers the first unique inert **RSA autosampler glass vials** (Reduced Surface Activity).

LC-MS users in trace analysis should evaluate RSA vials!

http://www.chromatographyshop.com/html/autosampler_vials.html

Mitsubishi

Under the name **MCI gel** Mitsubishi presents a wide range polymer phases for analytical separation of small and large biomolecules. **DIAION®**, **NEKROLITH**, **RELITE** and **SEPABEADS** are ion exchangers and adsorber materials for industrial applications.

http://www.chromatographyshop.com/html/mitsubishi_mci.html

PolyLC, Dr. Andrew Alpert, owner of PolyLC is world renowned as a manufacturer of **special columns for peptides and protein chromatography** with small (100 Å) to very large pores (1000 Å), Alpert invented 1990 the **HILIC** method. 2011 he invented the **ERLIC** method.

PolyCAT A is a weak cation exchanger, **PolyGLYCOPLEX A** was developed for the separation of complex carbohydrates. **Polyhydroxyethyl A** is an extremely polar separation material for the separation of peptides, carbohydrates, nucleic acids and many proteins. **Polymethyl, Polyethyl and Polypropyl A** are HIC columns for protein and peptide separations. **PolySULFOETHYL A** is a cation-exchanger for peptides and is considered the standard for **multidimensional SCX-RPC LC Methods in Proteomics**. **Polywax LP** is a weak anion-exchangers for protein and peptides. Since 2014 PolyLC materials are also available as 2 µm particles.

<http://www.chromatographyshop.com/html/polylc.html>

Princeton Chromatography Industry (PCI) is in business since 1993 and specialist for **Supercritical Fluid Chromatography (SFC)**. PCI also offers custom separation which they carry out on two Berger SFC instruments.

Princeton offers a range, competitively priced analytical and preparative HPLC column (Princetonspheres). Over the past years they created extremely stable HPLC columns for specific niche applications, such as a C30 RP column.

In addition, they pack SMB columns up to 50mm ID

<http://www.chromatographyshop.com/html/princeton.html>

Purolite is one of the largest manufacturer of **polymer-based bio separation materials for Adsorption, Immobilization of enzymes, Catalysts, and Solid Phase Extraction for analytical and industrial applications**. In addition, they manufacture a range of special materials for **Hydrometallurgy**. 2014 LCC has been appointed soledistributor for the Chromalite product range in Switzerland.

We also develop entirely new applications together with the chemist at Purolite.

Materials for RPC, SPE und Adsorption-LC you find here:

http://www.chromatographyshop.com/html/chromalite_rpc.html

Ion Exchanger you find here:

http://www.chromatographyshop.com/html/chromalite_ionexchange.html

Pages for Hydrometallurgy, Enzyme-carriers and heterogeneous Catalysts are under construction.

SIELC manufactures **innovative mixed-mode HPLC columns**. The **cationic column** is known as **Primesep 500** (RP material with embedded ion-pairing groups) **Primesep 200** (RP material with weakly acidic ion-pairing groups), **Primesep A** (RP material with strongly acidic ion-pairing groups) **Primesep C** for complex interactions and **Primesep P** for aromatic compounds. The **anion exchanger columns** are: **Primesep SB** (strongly basic), **Primesep B2** (Slightly alkaline), **Primesep D** was developed for the **direct analysis of blood plasma**. **Primesep AB** is used to **separate complex mixtures of anionic and cationic compounds**, such as Diquat / Paraquat. **Primesep X** is a hydrophobic amino column), **Primesep AP** (Hydrophilic-amino column), **Primesep S** (normal phase with acidic ion-pairing groups), **Primesep PB** (aromatic and basic ion-pair groups) **Primesep B4** (separation of inorganic anions), **Primesep N** (Normal phase). **Primesep S2** (hydrophilic material with acidic groups)

The **Obelisc range** consists of two complementary Obelisc phases R and N for the separation of **polar and non-polar compounds** with multiple release mechanisms, such as **RP, NP, ion exchange and size exclusion chromatography**

The **Promix range** consists of four different columns for efficient separation of proteins and peptides with ionic and hydrophobic forces.

2014 SIELC created two new product ranges, the **Coresep** and the **Sharc** materials. Coresep is the **first multimode solid core separation materials**. **SHARC** stands for **Specific Hydrogen-bond Adsorption Chromatography**. Its separation mechanism is based primarily on hydrogen bonding. <http://www.chromatographyshop.com/html/sielc.html>

Sepax Technologies are specializes in **biochromatography**. **Carbomix** phases are specialized for high resolution separation of water soluble organic compounds such as carbohydrates, organic acids, peptides or metabolic active substances. **Antibodix** are non-porous phase for the separation of antibodies. **Proteomix** for separating proteins, oligonucleotides, carbohydrates and peptides by ion exchange. **Sepax Polar** are special phases for the separation of highly polar and hydrophilic substances. **Sepax PolyRP** are monodisperse PS / DVB copolymers. **Zenix and SRT** are highly stable silica-based size exclusion chromatography phases. **Zenix-C and C SRT** are size exclusion chromatography phases with highly mobile Monolayer molecules. **Nanofilm SEC** are monodisperse Silicagel phases with hydrophilic surfaces for use in size exclusion chromatography. **Sepax CNT** was developed for **size exclusion of nanomaterials**. **Sepax BR C18** are porous Silicagel phases with high pH stability. **SepaxBio** are special organic phases for the RP-HPLC of biomolecules. **Sepax GP** and **Sepax HP** are classical Silicagel materials for RP chromatography. **Sepax SFC**, are monodisperse Silicagel materials for Super Critical Fluid Chromatography (SFC) (Page is under construction)

Shinwa Chemical Industries Ltd. produces **Ultron ES** columns for **chiral separation**. **Ultron ES-OVM** and **Ultron ES-Pepsin** are silicate phases with immobilized proteins. **Ultron ES-CD** and **ES-pHCD** carry Cyclodextrin ligands.

http://www.chromatographyshop.com/html/ultron_shinwa.html

Welch Materials produce columns with **very good price / performance ratio**. The **Ultisil range** consists of **Ultisil XB RP column** (C18, C8, C4, C1, phenyl), **Ultisil XB-polar columns** (CN, Si2O, NH2, Diol), **Ultisil XB ion exchange columns** (SAX, SCX), **Ultisil chiral column** (Chiral AD, AS, OD and AJ), **Ultisil XB Polar embedded HPLC column** (Polar RP, phenyl ether), **Ultisil XB fluorine-containing columns** (PF-phenyl, F-C8), **Application specific Ultisil XB columns** (PAH, amino acids, C30), **Unique Ultisil XB columns** (LP-C18, C18-AQ) is the

latest development. **Ultisil HILIC Amphion with multi-mode separation mechanism.** All columns are available as 3, 5 and 10 µm materials. **Ultisil UHPLC** range (1.8 to particle diameter) is available with the following modifications C18, phenyl, Polar RP and HILIC. **Xtimate range are hybrid and chemically stable HPLC columns** and available with the following modifications: **Xtimate RP** (C18, C8, C4), **Xtimate phenyl-hexyl**, **Xtimate CN**, **Xtimate Polar RP** and **Xtimate saccharides** columns. Ultisil columns show solid growth in the market with applications in natural products, generic pharmaceuticals, food and environmental protection. **Welch Chrome** stands for **high quality solid-phase extraction cartridges**
http://www.chromatographyshop.com/html/welch_materials.html

Zirchrom provides a broad range of **pH and temperature stable HPLC and UHPLC Columns** based on **zirconium and titanium oxide**. The materials have large pore diameter (300 Å) and a relatively small surface area (30 m² / g). In contrast to polymeric phases Zirchrom products **don't shrink or swell in solvents**. They show **different and unique selectivity** compared to silica phases. The range consists of seven different reverse phase, two normal phase, three anion exchange and two cation exchange columns.

<http://www.chromatographyshop.com/html/zirchrom.html>

We also provide:

We offer different **sample preparation techniques** as follows:

MatrixEx. Until today it was impossible to automate pesticides analysis inexpensively. After sample preparation food matrix is carried into the chromatography process contaminating the column and causing signal suppression in MS. The resulting analysis data is wrong, irreproducible and column life short. There are two solutions, the first one is to buy a high-resolution MS and the second one is to buy **MatrixEx**. The difference is in the cost and ultimately in productivity and competitiveness of your business. With the MatrixEx strategy the MatrixEx system is **installed between the existing LC and MS**. With **intelligent software**, a **novel column switching module and column oven**, it is now possible to remove the food matrix contamination, the analytical data is precise, column lifetime is extended several times, and the whole process can be completely automated for a very competitive costs. MatrixEx enables pesticide analytical labs to **compete with low-cost competitors**. MatrixEx is a productivity milestone in pesticide analysis

<http://www.chromatographyshop.com/html/matrixex.html>

Of course, we also offer a wide range of

Syringe filters http://www.chromatographyshop.com/html/syringe_filters.html

Solid-phase extraction materials : <http://www.chromatographyshop.com/html/spe.html>

QuEChERS: <http://www.chromatographyshop.com/html/quechers.html>

Flash chromatography : http://www.chromatographyshop.com/html/flash_chrom.html

Prep and process chromatography is still in its infancy. Chromatographic purification and separation is considered expensive and thus avoided. Many methods have been developed but further advancement is cumbersome. Silicate-based separation material development has gone asleep and is dominated by a few suppliers. Polymers based separation and adsorption material development is expected to make substantial progress in the coming years.

Industrial chromatography desperately needs a variety of new technologies, new perspectives and new business models. But this will come only with new applications. We are experimenting with new and very bold strategies to advance production scale chromatography.

Customers contact us from all over the globe with new ideas. We have a large selection of inexpensive components that can be customized according to customer needs so that they can face new challenges.

We develop under Confidentiality Agreement for selected clients novel chemical resistant materials and columns for applications in biotechnology, fine chemicals, catalysis, solid-phase synthesis and hydrometallurgy

We are convinced that one day chromatography will compete successfully with recrystallization. Together with our partners we have a large pool of highly innovative and constructive players that permanently evolve new progressive technologies

http://www.chromatographyshop.com/html/process_chromatography.html

Often professors, students, inventors and developers contact us to enquire whether or not we are willing to market their new technology, components, software, etc.. If your "new to the world" technology has clear potential applications or target customers we are very much interested to pursue your project. Important for us is the quality and maturity level of the novelty. Don't hesitate to contact us!

To prevent that chromatography is reduced to a commodity technology we run every year high quality seminars with chromatography gurus from around the globe. Enquire with us what courses will be available in future and when?

http://www.chromatographyshop.com/html/seminars_workshops.html

On the web page http://www.chromatographyshop.com/html/knowledge_education.html there are various, **non-commercial, knowledge-based pages.**

The first group of pages is about **basic chromatographic theories and tools**

The second group of pages is about **methods in chromatography**

The third group of pages is about **columns and separating materials**

At the moment you find the following pages:

What purification or separation method should I use to solve my problem?

- Reversed Phase Liquid Chromatography
- Normal Phase Liquid Chromatography
- Hydrophilic Interaction Liquid Chromatography
- Aqueous Normal Phase Liquid Chromatography
- Electrostatic Repulsion-Hydrophilic Interaction Chromatography
- Ion Exchange Chromatography
- Ion Chromatography)
- Hydrophobic Interaction Chromatography
- Affinity Chromatograph
- Chiral Separation
- Size Exclusion Chromatography
- Super Critical Fluid Chromatography
- Multi Mode Liquid Chromatography
- Metabolomics
- Proteomics



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- Preparative & Process Scale Chromatography
- Multi Dimensional Liquid Chromatography
- Capillary Electrophoresis

Tools for purification, separation and chromatography specialists

- Therms used in chromatography
- Solvents used in chromatography
- Wide range of Buffers
- Column Care
- Columns in Process Chromatography
- Columns in Analytical Chromatography
- Conversion from HPLC to UHPLC

What column or phase to I use?

- Column / Phases Selector

Web-sites are sometimes being hacked, re-organized or changed. Please contact us if you find some problems with the site. We appreciate if you report a problem or tell us if content is not up to the latest state of technology.

Since the introduction of zero-base budgeting researchers are forced to procure some products before the end of finance year. Unfortunately, research is not always on-time or schedule. We offer a **subscription system** enabling researchers to get their required products after the annual budget time whenever the products are needed. Please enquire!

Products, price and technical information, please contact us :

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