



For Quality and Innovation.

 **VISCOTHERM**

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## For Quality and Innovation.

Viscotherm AG ranks internationally as the leading manufacturer and supplier of decanter drive systems. We owe this leading position to the acceptance of our products on the market.

This is based on:

- intensive research and development
- quality surveillance
- extensive application know-how and experience

Our equipment is designed with the future in mind. Early knowledge of economic and technical change gives us a competitive edge. That is how we create exceptional customer benefits.

Innovation has always been a distinctive feature of Viscotherm AG. After years of fundamental research, the company placed its range of products on the market and secured technological leadership in its field from the outset. Viscotherm AG continues to safeguard that leadership through constant innovation and development in the field of hydrostatic, electronic and sensoric systems.

With constant innovative adaptations and further developments in the field of hydrostatic, electronic and sensoric systems, Viscotherm AG safeguards their position at the top of their field in terms of technology.



## Motivation is our driving force.

Motivated members of staff implementing high aims.

In the fields of:

- Research / Development
- Marketing / Sales
- Engineering / Production / Quality control
- Project management / Order processing
- After-sales and spare parts service
- Installation and maintenance service

Marketing / Sales

- targeted, customer-oriented market research
- market shares, optimum price / performance

Research / Development

- patents
- market-oriented developments
- use of the latest technologies
- continuous introduction of improvements and developments

Engineering / Production / Quality control

- ISO 9001 certified
- close cooperation between these sectors safeguards our quality policy
- customer-oriented designs
- use of CAD to produce drawings, manuals etc.
- modern CNC production machinery, rational production processes
- environmentally-conscious production
- guarantee of product durability

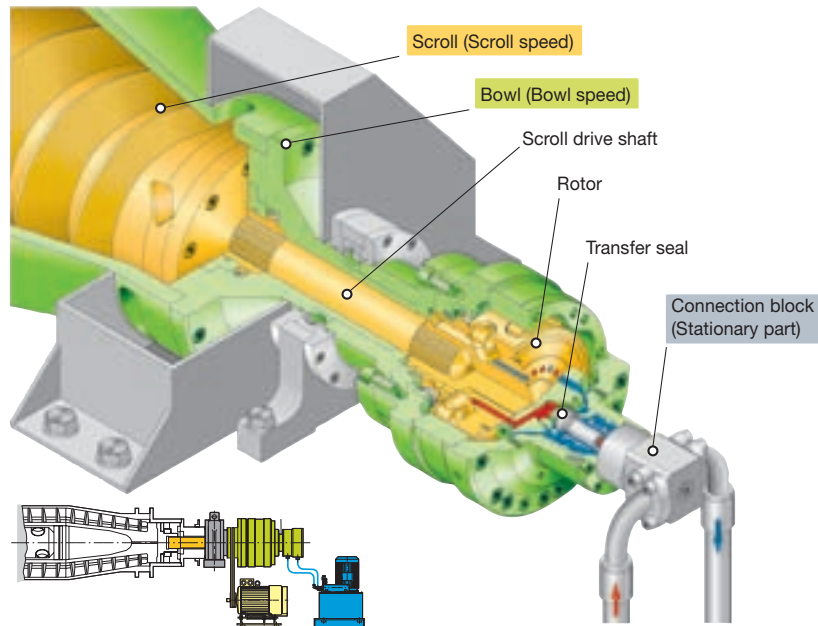
The solid bowl decanter centrifuge serves for the continuous mechanical separation of the mixtures containing solids and liquids separation of suspended material from liquids.

The removal of water from sludge and suspensions, clarification or thickening of slurries and for the classification of fine particles, classification/separation of 3-phase mixtures.



## Technology with potential.

### Working principles of a horizontal solid bowl decanter centrifuge with a hydrostatic drive system



The solid bowl decanter centrifuge serves to continuously separate suspended solids from liquids or to clarify or thicken liquids or to classify fine particles. The sludge is accelerated in the centrifuge to a multiple of the earth's gravity. Because of this high G-force, the heavier sludge is pressed against the inside diameter of the rotating bowl and is transported from there by means of the scroll into the conical part of the centrifuge, from where it discharges through the cake outlet. The centrifuge effluent flows through adjustable weir plates via the run-off pipe. The hydrostatic Viscotherm drive consists of the hydraulic motor ROTODIFF which is fed by a hydraulic pump unit. This means that the scroll can be operated totally independent from the bowl drive.

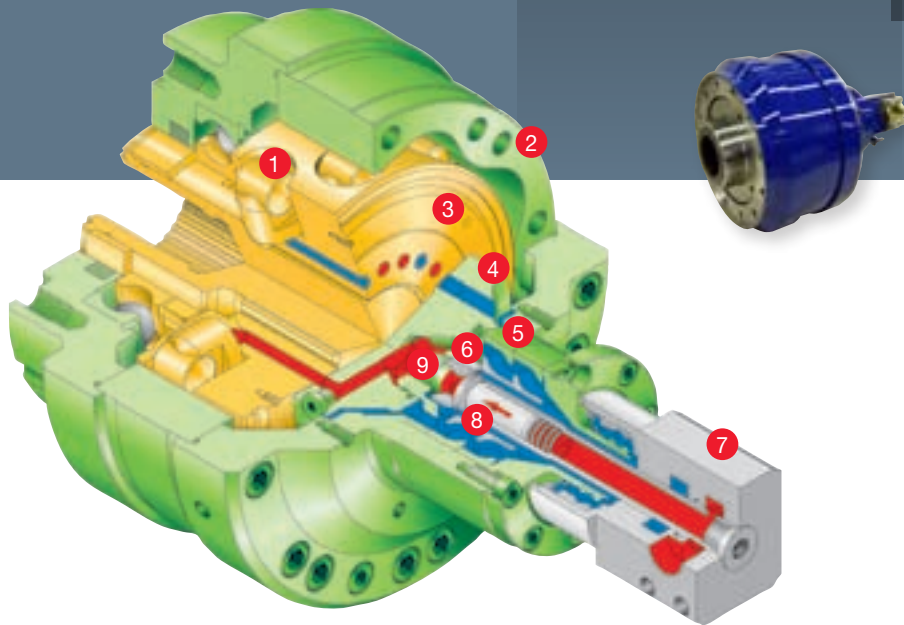
The hydraulic oil pressure is directly proportional to the scroll drive motor torque of the ROTODIFF and this is in turn, directly proportional to the volume of the solids loading in the bowl. This context enables a closed loop that allows the differential speed of the scroll to be regulated in accordance with the deposited solids.

This means that when the scroll torque increases, the differential speed of the scroll automatically increases directly proportional to this. The solid loading in the bowl will remain constant which results in a constant maximum solid dryness with a maximum discharge capacity. As a result, the centrifuge can be operated at its optimal performance without plugging.

Differential speed variation strongly influences:

- the solids throughput and therefore the solids production
- the solids retention time
- the solids loading in the decanter

1. Piston-Roller
2. Cam
3. Rotor
4. Distributor
5. Angular ball bearing
6. Double cone floating excenter ring
7. Connection block
8. Compensation cap
9. Excentric ball cone



#### Advantages Hydraulic Scroll Drive Systems

- Technology and quality = robust build to suit harsh operation conditions
- Outstanding weight / torque ratio
- Long service life, high dependability even in the most adverse conditions especially on products which cause "chatter" or "slip-stick"
- Overload protection
- Behaviour of the drive during special operation sequences (CIP, ...)
- Automatic regulation and controllability
- Operation in hazardous areas possible (Ex-proof and ATEX certification)



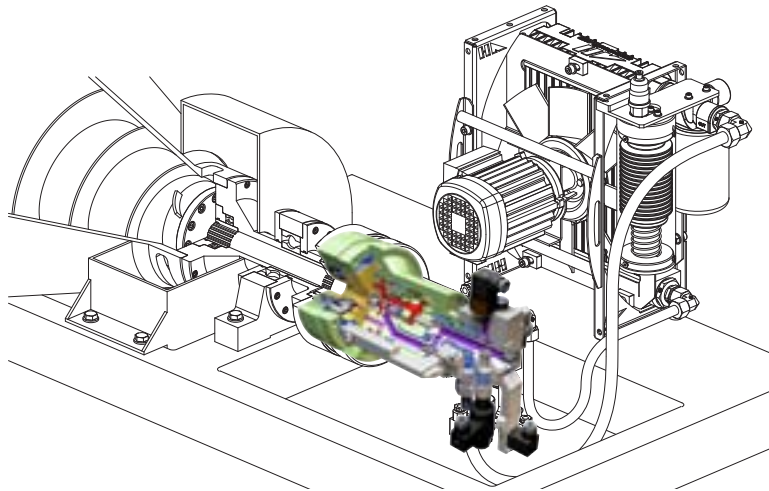
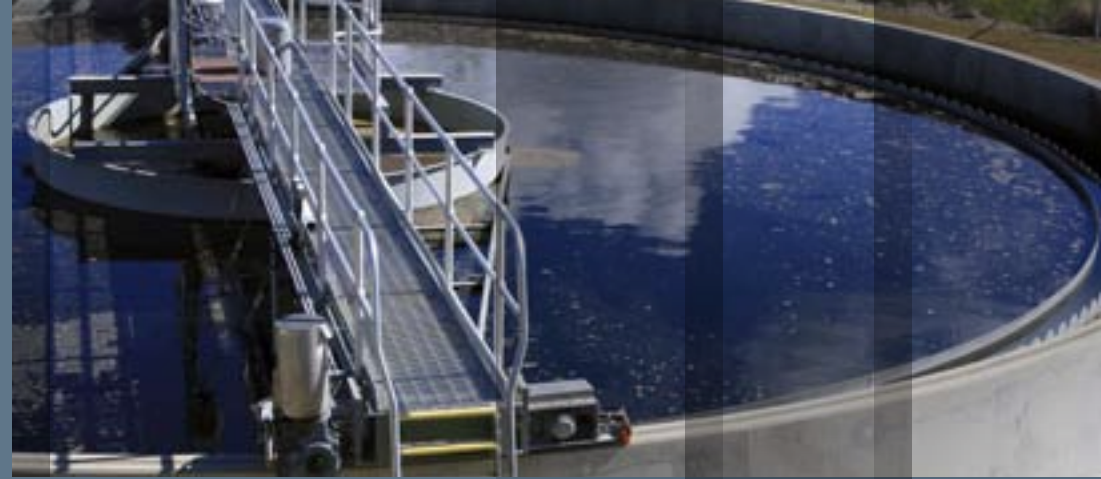
## The heart – the hydrostatic drive ROTODIFF®

The hydraulic motor ROTODIFF is a slow speed high-torque radial piston motor, whose housing is bolted to the bowl. The Rotodiff rotor is connected with the scroll by a splined shaft, and this second speed is consequently the scroll speed.

Hydraulic solid bowl centrifuge drives from Viscotherm have all the essential benefits to process technically difficult products. With products, such as, animal meal, fish meal, casein, lactose, starch, PVC, cellulose derivatives etc. that tend to product dependent oscillation or 'chatter' as a result plasticizing of the sediment, or torsional vibrations from "slip-stick", the lifetime of a ROTODIFF drive is considerably higher than that of a gear-box. Applications in ex-protection are completely ensured thanks to the ATEX certification.

With electronically controlled operating and control systems from Viscotherm, important values such as the hydraulic pressure, bowl and differential speed can be monitored, displayed and set. The scroll drive can also be controlled remotely. Thanks to field bus technology, these control units can simply be integrated into other process control systems.

Hydraulic motor ROTODIFF® and hydraulic pump station in one unit!  
Compact - ROTODIFF



## Innovation Compact-RODODIFF.

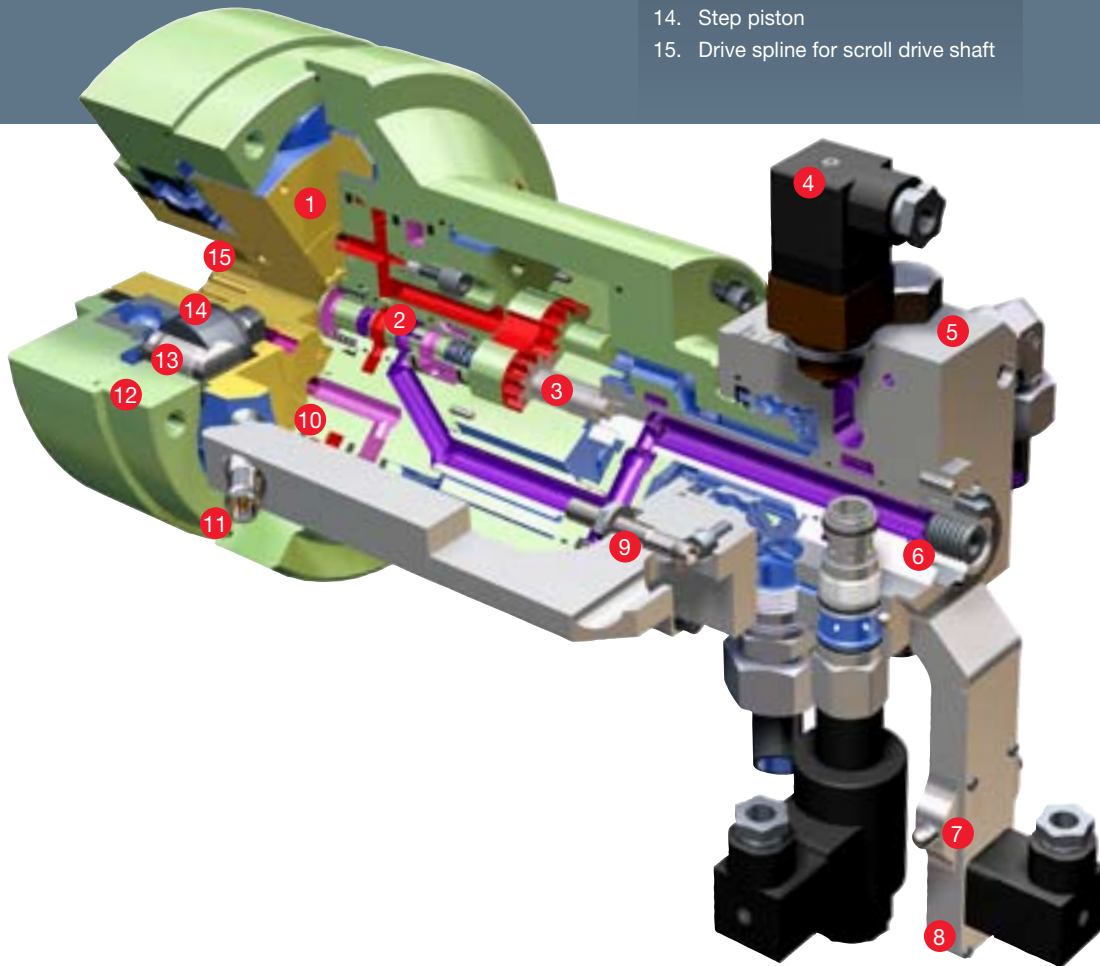
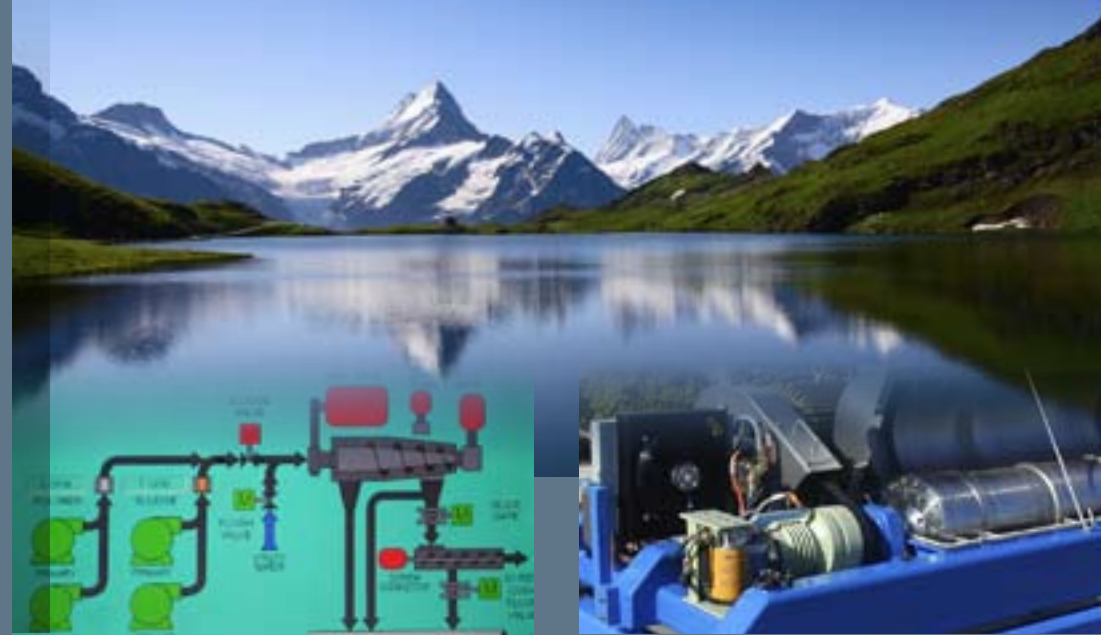
The major application growth will continue to be in the processing of waste slurries due to the increased demands of municipal and industrial waste treatment.

Viscotherm's latest development is a cost-effective centrifuge scroll drive for the market segment for small centrifuges. The compact ROTODIFF is a hydraulic scroll drive whose hydraulic motor also includes the hydraulic pump, and therefore the hydraulic oil supply. This enables us to offer a new drive system that shows all of the benefits of our classical hydraulic drive but on a more cost-effective basis. Because the hydraulic pump is integrated in the ROTODIFF, we are able to forgo a pump unit completely. As a result, this innovative drive system contains just the ROTODIFF hydromotor and an external oil conditioning made up of an oil cooler which includes all the required filtration, control and measuring devices.

Initial equipment installations and up-upgrades of existing gear drives are possible thanks to simple installation with the absolute minimum of effort.

With these new developments and numerous further customer-specific adaptations and innovations Viscotherm proves once again its innovative and leading position in the field of decanter centrifuge drives.

1. Rotor
2. Flow control valve
3. Gear pump
4. Temperature switch
5. Connection block (stationary)
6. Stationary shaft
7. Torque sensor
8. Torque arm
9. Bowl speed sensor
10. Distributor
11. Scroll speed sensor
12. Cam
13. Roller
14. Step piston
15. Drive spline for scroll drive shaft



## Highlights.

- Very price competitive drive system
- Technically advanced compact design
- Robustly built with integrated pump giving high operational security
- Excellent weight to torque ratio
- Good center of gravity position & low weight drive system
- Very low noise level
- No overload, a pressure relief valve protects the drive
- Minimal operational costs through small oil volume and increased oil and filter life due to a closed oil circuit. The oil is kept out of contact with air
- Simple attachment to the centrifuge reduces installation costs. One electric motor powers the bowl and scroll drive
- Automatic operation! Control and monitoring of the operation with easy integration into a process controller through standard interface (field bus interface)
- Air blast cooling reduces operating costs and downtime

Hydrostatic drive systems from Viscotherm AG for test rigs and renewable energy sectors.

- Hydromotors for helicopter test rigs
- Hydropumps for wind power stations



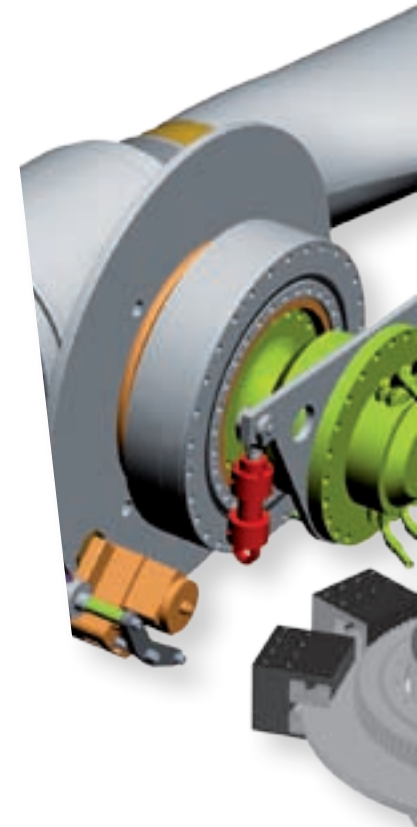
## In the Upwind – Hydromotors for the aviation industry.

Viscotherm radial piston motors are used to carry out testing on helicopter gear box drive systems.

Manufacturers of helicopters use test rigs for new production and for maintenance and reconditioning purposes to test the helicopter gears on both the main and the rear drives. The main motor gear MGB (Main Gear Box) is in each case thoroughly tested.

The test criteria include, alongside the revolutions of the rotor and the torque, also the oil pressure of the gear box, the temperature of the lubricant and the oil temperature. These measurements are carried out with the gear box placed under load and are tested to ensure that threshold values are maintained.

Hydrostatic radial piston motors with integrated rotary transfer seals from Viscotherm are the main components of such complex test rigs.





## Technology meets forces of nature – Hydropumps for wind power plants.

The characterising feature of all Viscotherm drive systems is the optimal adaptability to different conditions of use.

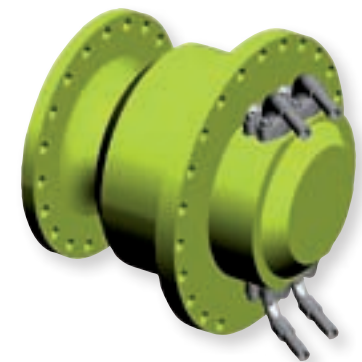
Hydrostatic drives have long since been implemented as standard in places where it is necessary to convey large forces and energies reliably. In wind turbines, the mechanical gearbox between the rotor shaft and the generator is replaced by the hydrostatic drive. With this technology, the essential benefits of the wind power plants without gears are to be united, for the construction of wind farms. The hydrostatic drive is, in essence, made up of a hydropump at the rotor shaft and one or more fast running hydromotors that drive synchronous generators, as well as the hydraulic systems with oil tank, hoses, valves and accumulators.

The drive technology of wind power plants must meet many special requirements in addition to the traditional demands: Variable wind loads, reduced construction space, and as small a mass as possible, along with a high capacity and operational life time.

Radial piston pumps from Viscotherm are ideally suited to meet the requirements of such systems and to fulfil the high demands with the corresponding level of reliable security.

Compact and reliable:

- No main gear box
- Constant generator drive thanks to the hydraulic system
- No frequency converters
- No heavy transformers
- Increased reliability
- Reduced operating costs
- Flexible and compact construction
- Reduction of the system weight at the pod
- Reduction of the structural load of the drive train
- Improvement of the ease of assembly



The variable transmission ratio means that it is possible to use high-voltage synchronous generators which have the advantage that no heavy transformers and expensive frequency converters are required. This construction has the additional benefit that the drive train can be divided into smaller components that can be lowered by crane from the pod.



## In the use for the Ecology.

For more than 35 years, Viscotherm AG has taken separation technology forward through continuous innovation with its ROTODIFF decanter centrifuge drives. This development is typified by exceptional flexibility of the equipment, adaptation to widely varying operational conditions.

- Waste Water Treatment Plants
- Chemical industry
- Food industry
- Drilling technology
- Bio fuels
- Environmental technology
- General industry



Swiss Quality – world wide – thousands of drive systems in operation!

**Environmental technology**

Communal waste water, Industrial waste water, Slop oil, Slurry, Tannery sludge,

Bio ethanol, Wind power plants

**Geo-drilling technology**

Treatment: Reclamation of drilling fluids, reclamation of barite, removal of water and conditioning of drilling mud, Tunnelling

**Mining and ore preparation**

Aluminium hydroxide, Bentonites, Calcium carbonate, Coal mines, Kaolin, Titanium dioxide

**Chemical products**

Alum sludge, Bio substrate, Dye pigments, Gypsum, Insulin, Intermediate pharmaceutical products, Lead oxide, Mineral oil, Polyethylene, PVC, Silica, Various salts, Zinc oxide

**Foodstuffs**

Animal fats, Beer yeast and wine lees, Blood, Casein, Cheese production, Distillers malt, Drinking water processing, Fish meal, Fish press water, Fruit juices, Gelatine, Gluten, Lactose, Meat extracts, Monosodium glutamate, Plant extracts, Potato starch, Proteins, Vegetable juices, Vegetable oil, Starch, Wheat starch, Wine yeast and wash

# Viscotherm – Service Worldwide.

We are where you need us. We believe proximity to the market is the fundamental requirement for added value from partnerships, and it secures the long-term success of our clients.



Viscotherm Service & Wartungs GmbH | 65366 Geisenheim | Deutschland  
R&C Valve Repair, Inc. – Viscotherm | Santa Fe Springs CA 90670 | USA  
Viscotherm - Swiss Precision Pte. Ltd. | 608781 Singapore | Singapore  
Beijing Vislong Drive Equipment Co., Ltd. | Beijing 101113 | P.R. China



Headquarters

Viscotherm AG | Neuhaus | 8132 Hinteregg-Zürich | Switzerland | Telefon +41 (0)44 986 28 00 | Fax +41 (0)44 986 28 28 | [www.viscotherm.ch](http://www.viscotherm.ch)