



FINNCHAIN

Keeping up your process

Scraper Systems for Rectangular tanks

International product development

Finnchain Oy represents strong expertise in environmental technology and invests in continuous product development in order to find new and innovative solutions. Years of development work have resulted in a number of patents for water and wastewater treatment that are being utilised all over the world.



Innovative and experienced

New types of solutions for chain scraper systems since 1984.



Reliable

Reliability in operations and deliveries is the cornerstone of our operations.



Environmentally friendly

Sustainable products with a long life time represent friendliness towards the environment at its best.



Fully economical

The products' long life time and low operating and maintenance costs stand for profitable investments.



Partners

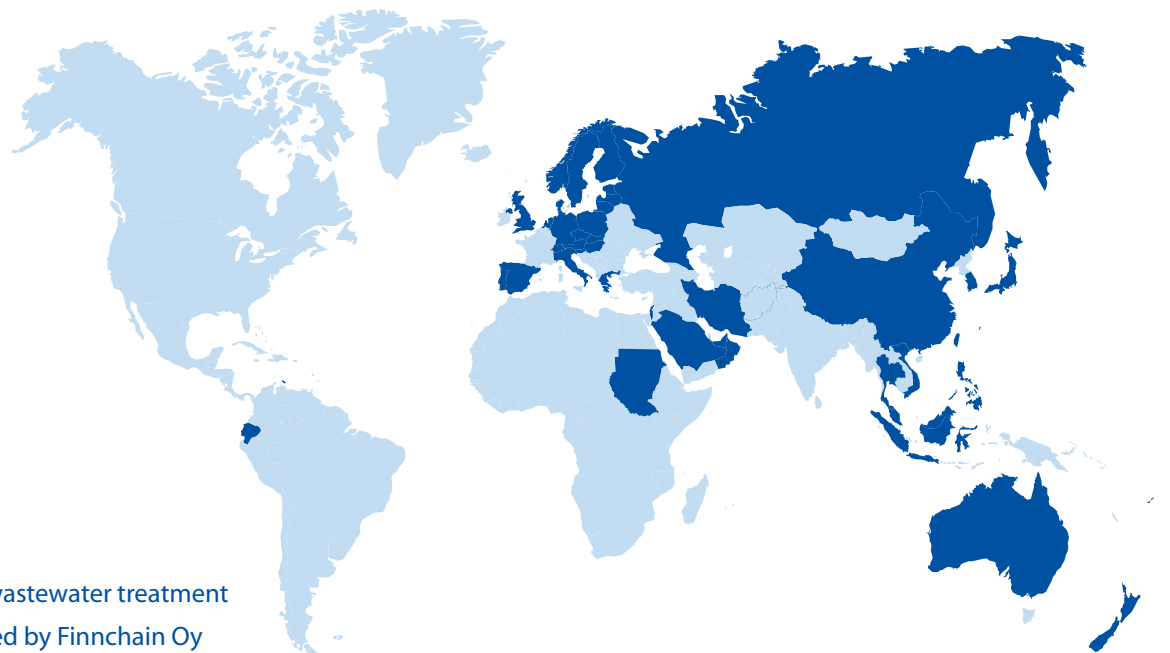
A functional and profitable partnership consists of trust and commitment towards common goals.

Company

Finnchain Oy represents strong know-how in the field of chains, specialising in environmental applications.

The company develops, manufactures, markets, installs, and maintains firstclass sludge scraper systems for water and wastewater treatment. We want to serve our customers by providing them with the latest technology and as maintenance-free and reliable overall systems as possible. The significance of product development

is demonstrated by the many international patents granted to the company and the company's success in the international market. As we are concentrating only on scraper systems, we are capable of acting quickly and flexibly. Reliability in operations and deliveries is the cornerstone of our operations.



The water and wastewater treatment systems delivered by Finnchain Oy have gained an international reputation, and the devices are being used in more than 40 countries.



Finnchain systems

Finnchain systems are suitable for a number of different uses, providing superior properties. Scraper systems for rectangular tanks are being used in several municipal water and wastewater treatment plants, and in a number of industries, such as the paper, metal-, and food industries.

NON-METALLIC CHAIN SCRAPERS SINCE 1984

Finnchain has vast experience in manufacturing chain scrapers for wastewater treatment plants. The first notched-link collector chain systems were installed in Hämeenlinna, Finland, in 1984. The functionality of the patented solutions is well proven by several plants where the chains have been in use with the original components for more than 20 years.

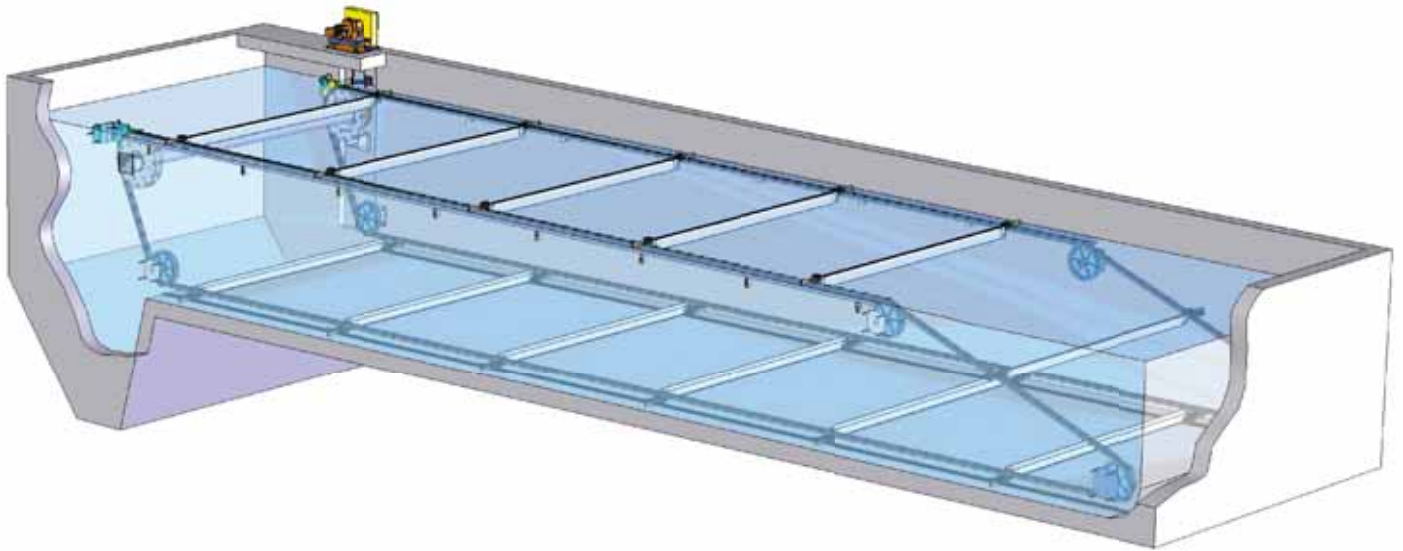
CONTINUOUS PRODUCT DEVELOPMENT

Finnchain has specialised in sludge-removal and scum skimming equipment, and its profitable cooperation with Finnish wastewater treatment plants has resulted

in a number of patented, special features included in the Finnchain systems that improve the products' operational reliability, energy efficiency and decreases the need for maintenance.

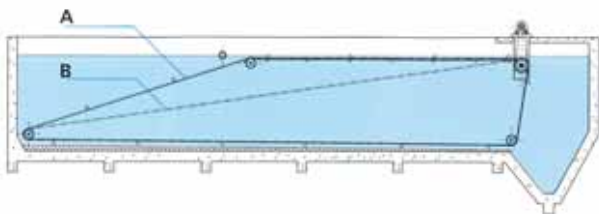
SOLUTIONS FOR DEMANDING SITES

Due to product development, Finnchain can also offer functional solutions for demanding sites. References include 12-metre-wide tanks (Sungai Selangor, Malaysia, 6 scraper systems), 100-metre-long tanks (Lodz, Poland, 6+4 scraper systems), and double layer tanks (Barcelona, 90 scraper systems).



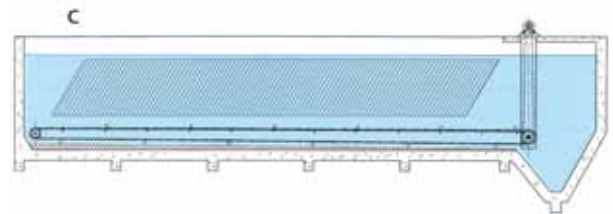
Surface and bottom scraper | type A

The most common chain scraper system scrapes sludge from the bottom and skims surface of the tank. A cross collector can be installed in the sludge hopper for transferring the sludge to the removal system.



Bottom scraper | type B

Collector chain runs over three wheels per tank side, scraping the sludge from the bottom of the tank to the sludge hopper.



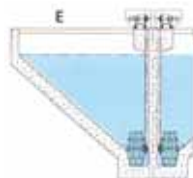
Bottom scraper | type C

Chain scrapers run over two sets of wheels transferring the sludge from the bottom to the sludge hopper. The middle and top section of the tank remains free for lamellas.



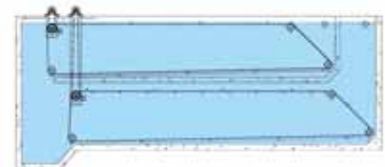
Surface scraper | type D

The surface scraper skims surface scum to the scum pipe. All scraper flights are equipped with a rubber blade. See also the FlexFlight and FinnFlow systems.



Grit collector | type E

In type E, the scraper flights and rails are made of stainless steel.



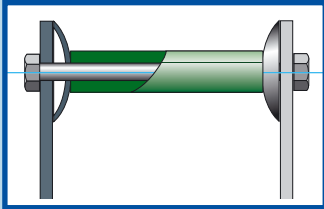
Double layer tank scraper | type G

Double layer tanks are deep tanks with scraper systems on top of each other. The scraper systems are generally of type A or B or a combination. Because of the difficulty of maintenance, operational reliability plays a crucial part.

Long life time and operational reliability

Lapua Wastewater Oy, Managing Director Olli Keskiäsaari:
"Finnchain sludge collector system was installed in eight
47 m x 8 m and in four 36 m x 6,5 m sedimentation tanks in
1992. Only three idle wheels have been replaced in 1999, 2004
and 2007. Most of the original components, including the
collector chain are still being used after more than 17 years of
continuous use. We are satisfied with Finnchain scrapers."

The drive pin, the only wearing part of the drive wheel, has been designed to be as easy to replace as possible. The plastic sleeves that are fastened with screws are quick and easy to replace.



Components designed for long life time

One of the leading ideas behind our product development is to achieve long life time for our products – this will reduce life time costs and save natural resources. The long life time of the parts is due to the following patented

PATENTED NOTCHED-LINK CHAIN

Because of the special chain structure, bearing surfaces are as large as possible, increasing the life time of the collector chain. The chain is pulled from a notch instead of a joint, guaranteeing a longer life time for the collector chain.

DRIVE WHEEL WITH THE PIN STRUCTURE

The drive wheel consists of two plates and pins between the plates made of stainless steel. The only part that wears is the drive pin's plastic sleeve that can easily be replaced without lifting off the chain from the wheel.



Sprocket wheel driven chains

The sprocket wheel pulls the chain from a joint, wearing the chain-bushing from the outside. The chain pin wears the bushing from the inside, causing the bushing and chain to wear quicker.



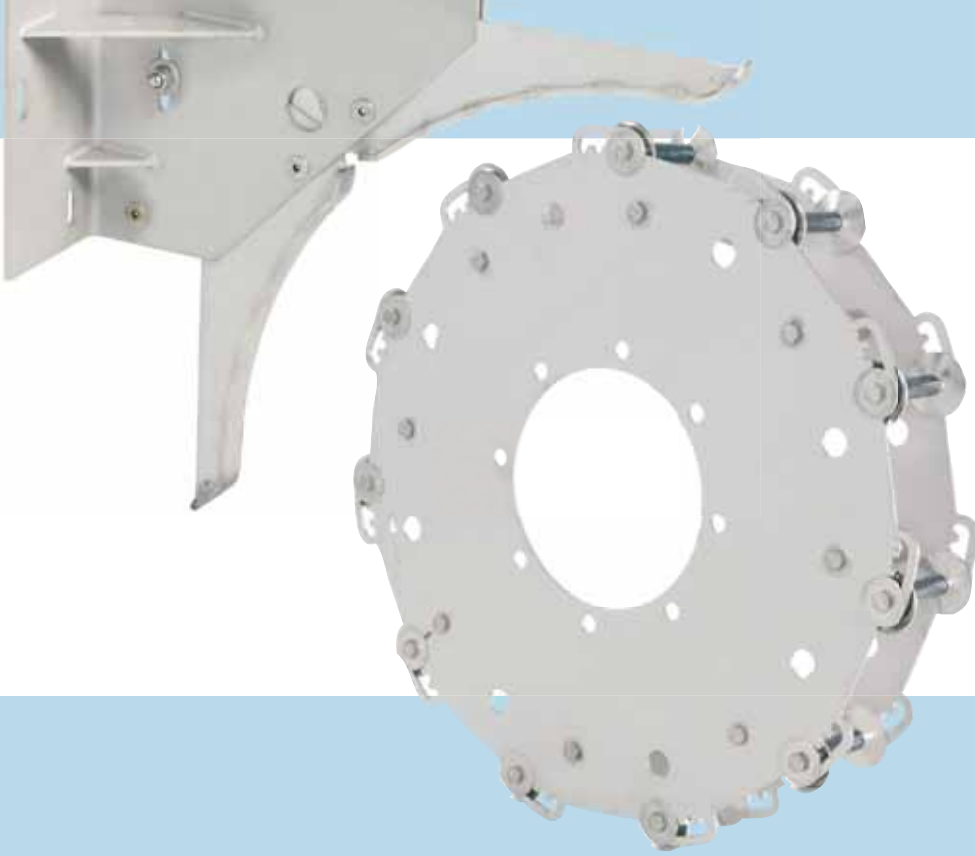
Notched-link chain

The drive wheel pins are pulling the chain from the notch instead of joint and therefore only the pin is wearing the bushing. Less chain wear results in longer life for bushing and chain.



Reliability and operational dependability

One of Finnchain's biggest clients is Ebara Engineering Service in Japan. Ryo Ishikawa, the Project Manager of E.E.S, says: "We have sold over 500 Finnchain scraper systems in Japan since year 2000. Finnchain scraper system is excellent in performance and the simplicity of the design has convinced us during the years. We hope the market for Finnchain scraper system will grow further in the future."



The Finnchain system's Chain Watch prevents the chain from jumping mechanically increasing the scrapers' reliability.

Patented solutions

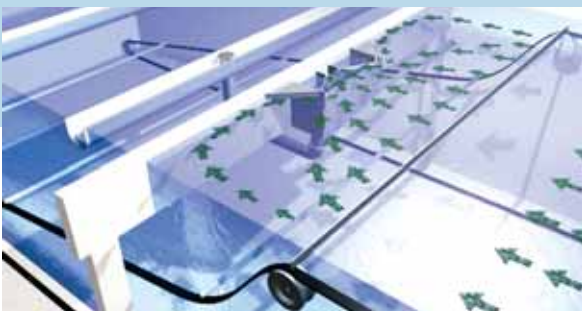
The second leading idea behind our product development is to make the system as reliable as possible – this will reduce operating and maintenance costs, ease the operators' work, and save natural resources.

FINNFLOW® – THE ENERGY-FREE SURFACE SCUM REMOVAL SYSTEM

The surface scum removal system is based on the utilisation of water flow and water levels, an efficient system that does not consume any energy. The utilisation of the natural water flow eliminates the need for motors and produces savings in operational costs.

CHAIN WATCH – INCREASING OPERATIONAL RELIABILITY

The benefits of chain watch are undisputed. The Chain Watch mechanically prevents the chain jumping off from the drive wheel, securing an even and failure-free operation of the scraper. Because of the Chain Watch, the chain does not need to be kept tight continuously. Read more in the Chain Watch brochure.



Because FinnFlow® system does not contain any moving parts, it is reliable, has a long life time, and requires only little maintenance.



Psyttalia Wastewater Treatment Plant, Athens

In 2003–2004, a total of 128 chain scraper systems were delivered to the Athens Wastewater Treatment Plant. The tanks are final sedimentation tanks with the following dimensions: 64 tanks (length 25.5m, width 8.7m) and 64 tanks (length 54.5m, width 8.7m). The Finnchain system's operating reliability and minimum need for maintenance were crucial factors in making the acquisition decision.



Turku Wastewater Treatment Plant

The Turku Wastewater Treatment Plant was built inside the bedrock. In 2007, Finnchain delivered chain scraper systems for the primary and final sedimentation tanks – 8 primary tanks (length 34m, width 8.6m) and 16 final tanks (length 53.5m, width 8.8m). In addition, Finnchain's new FinnFlow® system was installed in two primary sedimentation tanks in 2008.

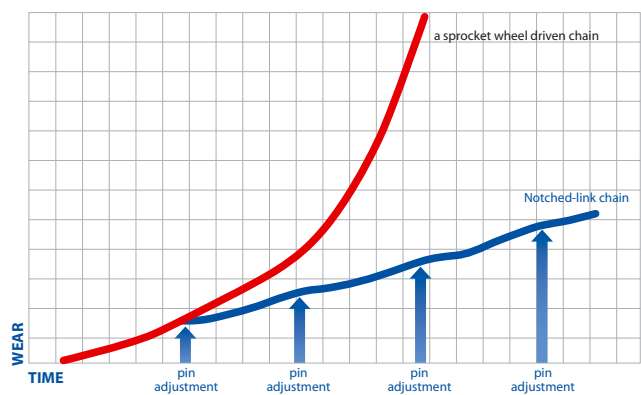


Operating reliability and long life time brings cost savings for investments

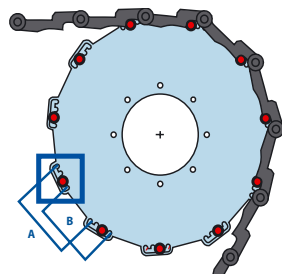
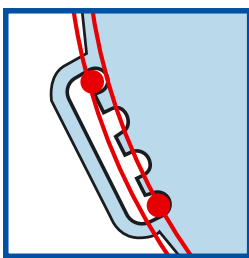
The operating reliability and long life time of scraper systems are at the very top of the industry. The operability, efficiency, and operating reliability of our systems guarantee that they are profitable investments in the long term.

PATENTED DRIVE WHEEL WITH ADJUSTABLE PITCH

The links of all types of chain elongate over the time being in use. As the chain stretches or wears through time, the chain pitch may not correspond to the drive wheel pitch and the entire load is pulled with a single link at a time. Finnchain has compensated the elongation of the chain by a simple and ingenious adjustable pitch drive wheel. By adjusting the pulling pins, the stretched and worn chain link will be able to match the drive wheel sprockets by increasing the diameter of the pitch circle. This increases the life time of both components and improves operating reliability.



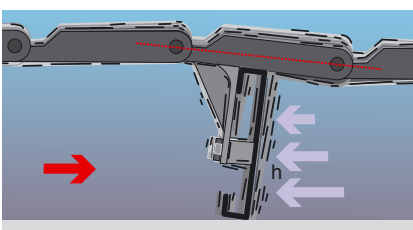
The drive pin adjustment performed during basic maintenance increases the life time of the chain and wheel.



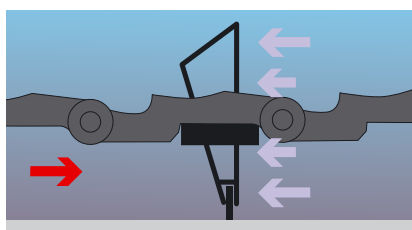
The mutual distance $B (= \text{pitch})$ of the driving pins increases by moving all of them towards direction A .

PATENTED FLIGHT ATTACHMENT

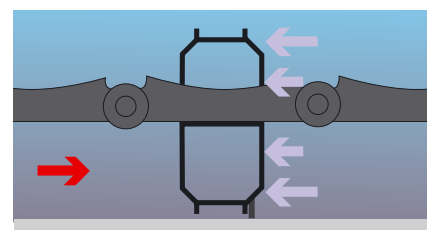
In traditional scraper flight installations, the flight is exposed to vibration, causing the chains to wear quickly. We have been able to remove vibration through the flight's profile and by lowering the chain's attachment point to the middle of the flight. These factors also increase the life time of chains and improve the operating reliability of the chain scraper.



In traditional scraper flights, the pulling alignment is up. The flight is exposed to vibration, which causes the chain to wear.



By lowering the chain's attachment point to the middle of the flight, the caused by vibration can be removed and the flight will run evenly.



The forces above and below the chain balance each other, causing the chain to run without any vibration and significantly reducing the chain's wear in the flight attachment.

Technical specifications

Chains

Type	Pitch mm	Breaking load, kN	Working load, kN	Joint bearing surface, mm ²	Tooth notch bearing surface mm ²	Pin diameter mm	Chain width mm	Chain height	Weight kg/m	Material
HA44	44	17	9	560	880	14	80	36	2,6	PA/POM
HA200	198	20	10	1 170	1 300	26	80	48	1,5	PA/POM
HA205	206	30	16	1 320	1 640	29	86	73	2,4	PA/POM

Drive wheels

Type	Pitch diameter, mm	Inner width, mm	Side plate thickness, mm	Drive pin diameter, mm	Material
Z=11/HA200	702	105	4	20	PEUR/AISI304
Z=12/HA205	800	125	4	20	PEUR/AISI304
Z=19/HA44	269	91	4	12	POM/AISI304
Z=46/HA44	650	91	4	12	POM/AISI304

Idler wheels

Type	Rim diameter, mm	Hub bore, mm	Hub length, mm	Weight kg	Material	Other
FC-76	450	76,1	125	4	POM	Cogless
FC-80	450	80	125	4	POM	Cogless

Scraper flights

Type	Flight height, mm	Flight width, mm	Moment of inertia		Torsional rigidity	Weight	Material	Glass fibre content, %
			X-X mm ⁴	Y-Y mm ⁴	Iv mm ⁴	kg/m		
FC-190	190	60	3 605 000	376 100	479 313	2	GRP	60-70
FC-200	200	100	5 724 000	1 152 500	2 520 000	2,6	GRP	60-70
FC-220	220	120	10 881 245	5 083 635	7 012 345	4,1	GRP	60-70
FC-300	300	100	11 183 000	1 664 100	2 521 000	3,2	GRP	60-70
FC-310	310	120	19 917 118	5 600 130	7 013 038	5,3	GRP	60-70

Rails

Rail	Type	Material	Dimensions, Width x thickness, mm	Weight kg/m
Bottom rail	FC-122/8	PP	100 x 14	0,8
Upper rail	FC-R100	GRP + PP	106 x 4	1,7
Upper rail	FC-Z3	AISI304	114 x 3	4,3

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