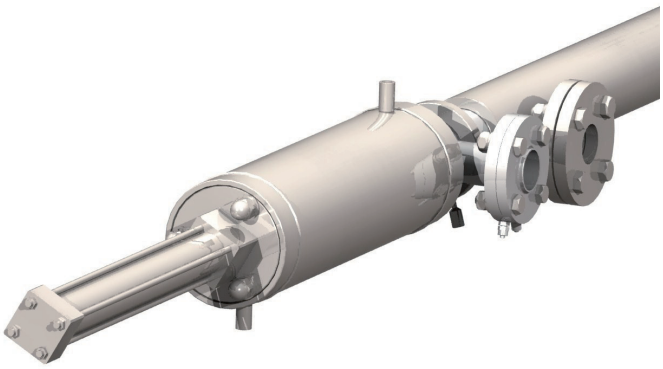
UNICUS SERIES

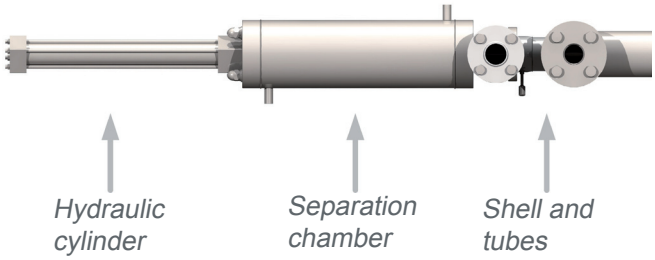
DYNAMIC SCRAPED SURFACE HEAT EXCHANGER



The Unicus is a scraped surface heatexchanger for high fouling and viscous fluid applications. The design is based on a traditional shell and tube heatexchanger with scraping elements inside each interior tube. The scrapers are moved back and forth by hydraulic action. The scraping action has two very important advantages:
- Any fouling on the tube wall is removed.
- The scraping movement introduces turbulence in the fluid. This increases heat transfer.

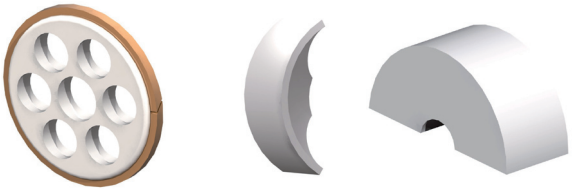
This design makes the Unicus the ideal heatexchanger for any applications where fouling or low heat transfer is a limiting factor. The Unicus can be applied in industrial and hygienic applications.

ELEMENTS OF THE UNICUS:



The Unicus consists of three parts:
A hydraulic cylinder that moves the scraper bars, the heatexchanger part (shell + tubes) and a chamber that separates both elements. The hydraulic cylinder is connected to a hydraulic power pack. This power pack is included in the supply. The smaller models of the Unicus range can be supplied with a pneumatic cylinder.

SCRAPED SURFACE:



The scraping systems consists of a stainless steel rod to which the scraping elements are fitted. The pictures show the various types of scrapers that can be applied. For each application, the optimal scraper is selected and fitted. Thanks to the unique design, the Unicus can work with fluids with big particles.

PRODUCTS:

Dairy:	Cheese, yoghurt, creams, deserts, whey concentrate, ice cream, condensed milk.
Fruits:	Juice concentrate, fruit preparation, fruit puree, diced fruit.
Vegetables:	Fried vegetables, tomato concentrate.
Convenience food:	Eggs, mashed potatoes, ketchup, mayonaise, baby food, dressings, spreads, fats, oils.
Protein:	Visceras, meat slurry, MDM, meat stuffing, minced meat, pet food.
Confectionary:	Chocolate, pie filling, creams, pastes, marmelade, syrups, gelatine, starch, butter, maragarine.
Beverage:	Coffee extract, juice freezing, juice concentrate, yeast-malt extracts.
Cosmetics:	Lotion, cream, gel.
Environmental waste:	Waste concentration: brine, manure, food plant effluent, chemical waste, solvent recovery.
Biofuels:	Oil extraction for biodiesel, biomass pretreatment, thermal hydrolysis, fermentation digestate concentration.

PROCESSES: Heating - Cooling - Pasteurization - Crystalization - Evaporation

PROVIDING THE TECHNOLOGY FOR HEAT TRANSFER APPLICATIONS

UNICUS SERIES

DYNAMIC SCRAPED SURFACE HEAT EXCHANGER

EVAPORATION:

HRS Heatexchangers designs a special version of the Unicus for evaporation applications. The principle is the same: a shell and tube heatexchanger with scraping rods in the interior tubes. During evaporation, fouling and reduced heat transfer can become a problem for traditional evaporators (falling film type etc.). In case of the Unicus, the scraping action keeps the heat transfer surface clean and maintains heat transfer high. This allows the Unicus to concentrate to levels where traditonial technolgies fail. This makes the Unicus the ideal solution for concentration of environmental waste where volume reduction is vital. The Unicus evaprators can be applied in a multi-effect setup or in combination with mechanical vapor recompression. Also vacuum concentration is not a problem for the Unicus evaporator. The scraped surface operation allows continuous operation and reduces downtime of the plant.

UNICUS STANDARD RANGE:

Models	Tube lengths (m)	Surface area (m2)	Shell side connection	Tube side connection	Volume Shellside (L)	Volume Tubeside (L)	Power (*) consumption (kW)
U 1/1 89/60	1,0 - 6,0	1,14	DN40	DN50	16,8	14,9	1,5 (**)
U 1/1 104/76	1,0 - 6,0	1,44	DN40	DN65	19,9	24,4	1,5 (**)
U 3/X 154/60	1,0 - 6,0	3,41	DN50	DN50	54,6	44,8	3,0 (**)
U 4/X 219/76	1,0 - 6,0	5,75	DN80	DN65	104,6	98,3	5,5 (**)
U 7/X 219/60	1,0 - 6,0	7,96	DN80	DN50	94,1	104,6	5,5 (**)
U 7/X 273/76	1,0 - 6,0	10,05	DN80	DN65	144,7	172,0	7,5

Unicus evaporator models can be supplied with areas up to 100 m2. Contact HRS Heat Exchangers for further details.

The surface area and volumes shown are for 6,0 meter length models.
(*) This power consumption is for a stroke rate of 10-14 cycle/min of the scraper bar.
(**) These models can be supplied with a pneumatic cylinder in stead of a hydraulic cylinder. The requiered air pressure is a minimum of 8 bar. Ask HRS Heat Exchangers for more details.

MATERIALS:

Service side: AISI 304 stainless steel.
Product side: AISI 316L stainless steel.

CONNECTIONS:

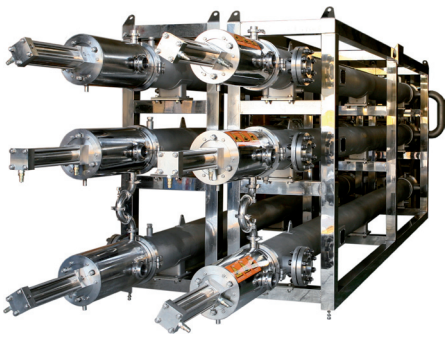
Service side: Flange.
Product side: Clamp / Flange.

DESIGN CONDITIONS:

Service side: 10 barg / 185 ºC.
Product side: 16 barg / 185 ºC.

FINISHING:

External finish: Polished.
Product side: Roughness < 0,8 micron (food grade finish).



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