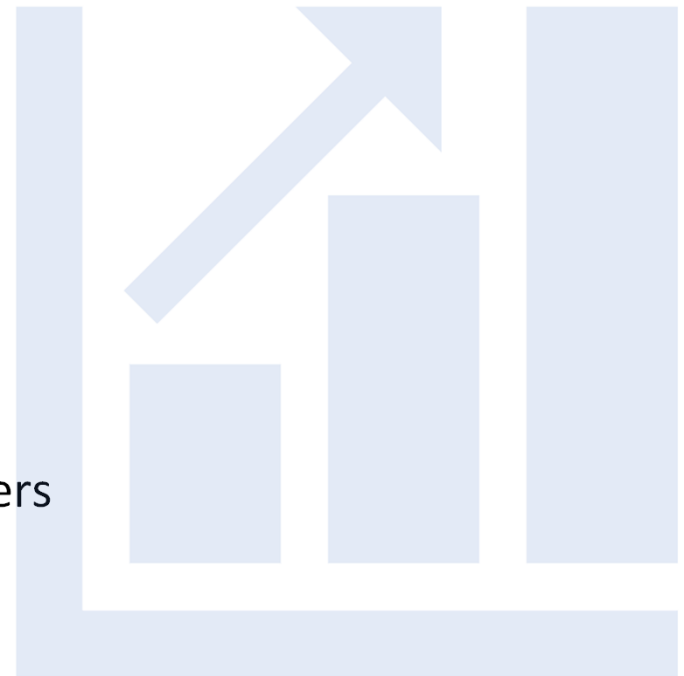




Centrifuge Market

2019 Analysis and Revenues for Suppliers



Centrifuge Market Overview

- “ This analysis is being continually updated to determine sales and areas of activity of centrifuge manufacturers.
- “ The total market for 2019 was determined by aggregating sales of many of the companies and iterating this analysis with the industry and other information gathered.
- “ The on line report shows equipment only numbers where as this analysis shows the equipment plus repairs and service which are part of a typical contract.
- “ This contract definition allows iteration with the individual reported revenues of the large suppliers of centrifuges.
- “ Segmentation by industry includes larger aggregated segments which are part of the individual supplier analysis.

Category \$ millions	Energy	L/S Chem	Water	Other	Total
Specified					
Unspecified	120	454	126	499	1200
Total					

In the energy segment most of the participant revenues are included. There are lots of small suppliers in the life sciences and chemical segment who are unspecified. Most of the water segment participant revenues are included but less than 50% of the miscellaneous revenues are accounted for by the individual analyses



Individual Supplier Revenues

- “ Energy includes power, oil, gas, refining and petrochemicals. The power segment includes shipboard fuel separation.
- “ Water includes municipal water, municipal wastewater and desalination.
- “ Other includes mining, steel and other industries.
- “ Life Sciences and chemical includes food, beverage, and pharmaceuticals and all chemical applications but not petrochemicals.
- “ Revenues are in 2019 dollars and include service and parts and any revenues which would be included in the centrifuge category on financial order and sales reports



Centrifuge Revenues - 2019 \$ millions

Company	Total \$	Energy	Life Sci & Chemical	Water	Other
Alfa Laval					
Andritz					
Anhui Puyuan					
Broadbent					
Centrisys					
Chengdu Tianbo					
Chongqing Jiangbei					
Dolphin					
Elgin CMI	8	1	1	1	5
F.L. Smidth	25				25

Centrifuge Revenues - % World Total, cont.

Company	Total %	Energy	Life Sci & Chemical	Water	Other
Ferrum					
Flottweg					
GEA					
GT Tech					
Guangzhou FuYi Liquid Separation					
Haishen Machinery					
Haus	0.3	0.3	0.5	0.2	0.2
Hebei GN					0.6
Hengrui					0.1
Huading Separator					0.2

Segmentation of Industry Sub Segments

Industry	Decanter	Disc	Other	Equipment	Total Contract
Life Sci - Chemical					
Chemical					
Food					
Pharmaceutical					
Other					
Metals					
Mining					
Other					
Pulp & Paper					
Energy					
Power					
Oil & Gas					
Petrochemical	20	40	30	90	121.5
Water					
Municipal Water					
Desalination					
Total					

Regional Forecasts

The following six slides provide segmentation into eight regions for three centrifuge types. Separate displays are provided for equipment only and for total contract including parts and service.

1. Decanter
 1. Equipment only
 2. Contract
2. Disc
 1. Equipment only
 2. Contract
3. Other Centrifuges
 1. Equipment only
 2. Contract



Decanter Centrifuges - \$ millions

Equipment Plus Parts, Services and System Support

World Region	2016	2017	2018	2019	2020	2021
Africa						
CIS						
East Asia						
Eastern Europe						
Middle East						
NAFTA						
South & Cent. America						
West Asia						
Western Europe	148.9	150.9	154.3	156.7	158.9	161.9
Total						



Exhibitions of Centrifuges (not covered elsewhere)

Venue	Companies
Beer X 2020, Liverpool	GEA (only 170 exhibitors)
China Coal and Mining	Andritz only centrifuge manufacturer listed for last 3 years
FI and Food Tec 2019	Andritz, GEA and FT27 with peeler centrifuge
Dairytec, UK 2020	GEA (only 100 exhibitors)
Frac Sand , Houston	Andritz
Interphex Japan 2020	Alfa Laval, IHI
Interphex NYC 2019	No centrifuge exhibitors
IFAT 2018 Munich	Andritz, Centrisys, Flottweg, GEA , Hiller, Pieralisi, Vitone
SME Mining 2020	Alfa Laval, Broadbent, Flottweg, Petroleum Solids rents centrifuges
WEFTEC 2019 and 2018	More than 8 exhibitors ---Complete analysis at http://home.mcilvainecompany.com/index.php/silobusters/municipal-wastewater-services

Achema 2019 Decanter Centrifuge Exhibitors

Company	Country
Anhui Puyuan Separation	PRC
ANDRITZ SEPARATION GmbH	D
FERRUM AG	CH
Flottweg SE	D
GEA Group AG	D
Huading Machinery Co., Ltd.	PRC
Lemitec GmbH	D
Padberg Zentrifugenbau GmbH	D
Pennwalt Ltd.	IND
RIERA NADEU, S.A.	E

Puyuan is one of the earliest professional separation manufacturing companies in China with a history of over 50 years, a member of China Separation Machinery Technical Committee for Standardization, National High-tech Enterprise. 40000 m2 plant makes decanter and basket centrifuges for chemical, food pharmaceutical and other industries.

Huading Separator is the leading manufacturer of disc separators in China since 1954. The company is now one of the market leaders in the field of centrifugal separation technology. Separators and decanters are used in different fields.

Andritz ORDER INTAKE BY BUSINESS AREA (IN MEUR)

At 1.1 = 587 million dollars for separation in first 3 quarters or an annualized rate of \$782 million

	Q3 2019	Q3 2018	+/-
Pulp & Paper	1,163	546	+113%
Metals	429	457	-6%
Hydro	343	303	+13%
Separation	159	164	-3%

	Q1-Q3 2019	Q1-Q3 2018	+/-
Pulp & Paper	3,089	1,726	+79%
Metals	1,239	1,403	-12%
Hydro	945	1,056	-11%
Separation	527	552	-5%

Separation total \$782
 Thermal separation \$250
 Filters, thickeners \$240
 Screens \$100
 Separators, centrifuges \$190

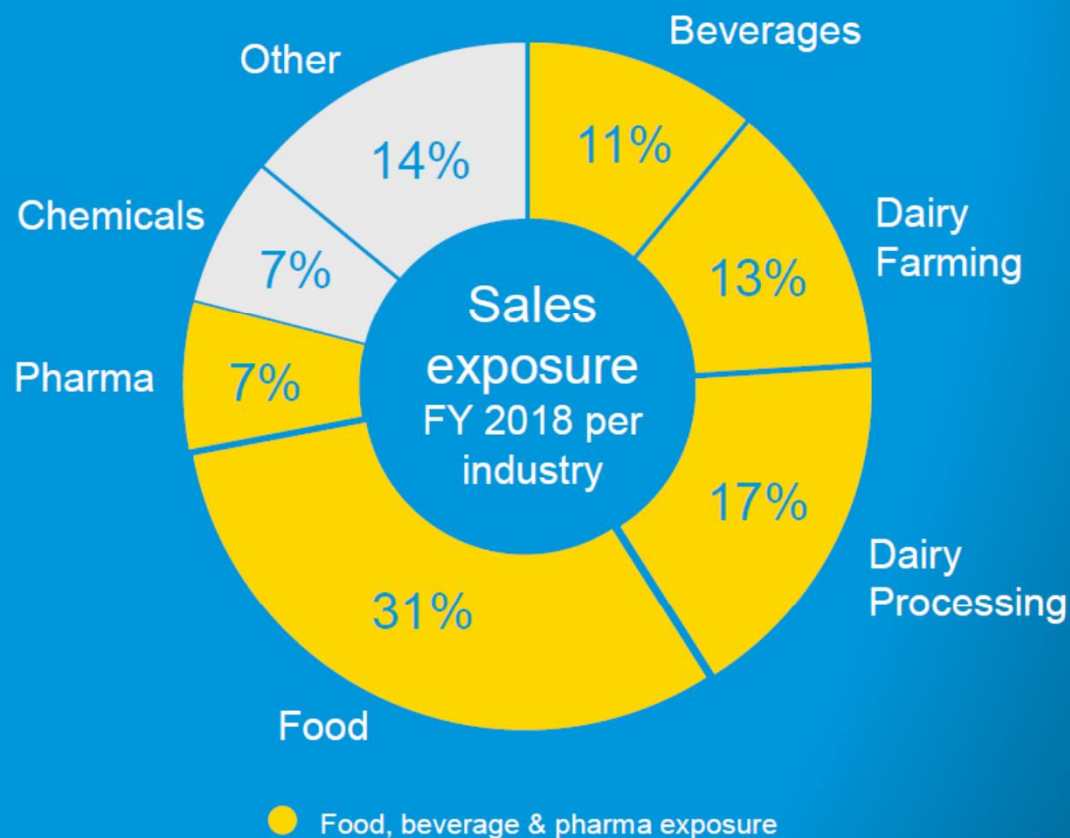




GEA



Food, Beverage
& Pharma
applications
represent
~79% of sales



Facts & figures 2019e

Sales
~€1.2bn

EBITDA¹
~21%

ROCE²
~31%

Employees³
~4,500 FTE

Separators

Homogenizers

Valves & Pumps

Share of div. sales
EBITDA margin
Market position

~75%
Below divisional average
#1

~7%
Above divisional average
Top 3

~18%
Above divisional average
Top 3-5

Key products

Separators, decanters

Homogenizers

Aseptic valves,
cleaning technology,
hygienic pumps and valves

Selected
customers

AB InBev
ADM
Asahi
Biogen
Bünge

Chobani
CSL Behring
Danone
DMK Group
Julphar
Yili

Hilmar Cheese Comp.
Hyundai
Nestlé
Novartis
Sanofi

Major
competitors

Alfa Laval, Andritz,
SPX Flow

SPX Flow,
Tetra Pak

Alfa Laval, Bürkert,
Pentair, SPX Flow

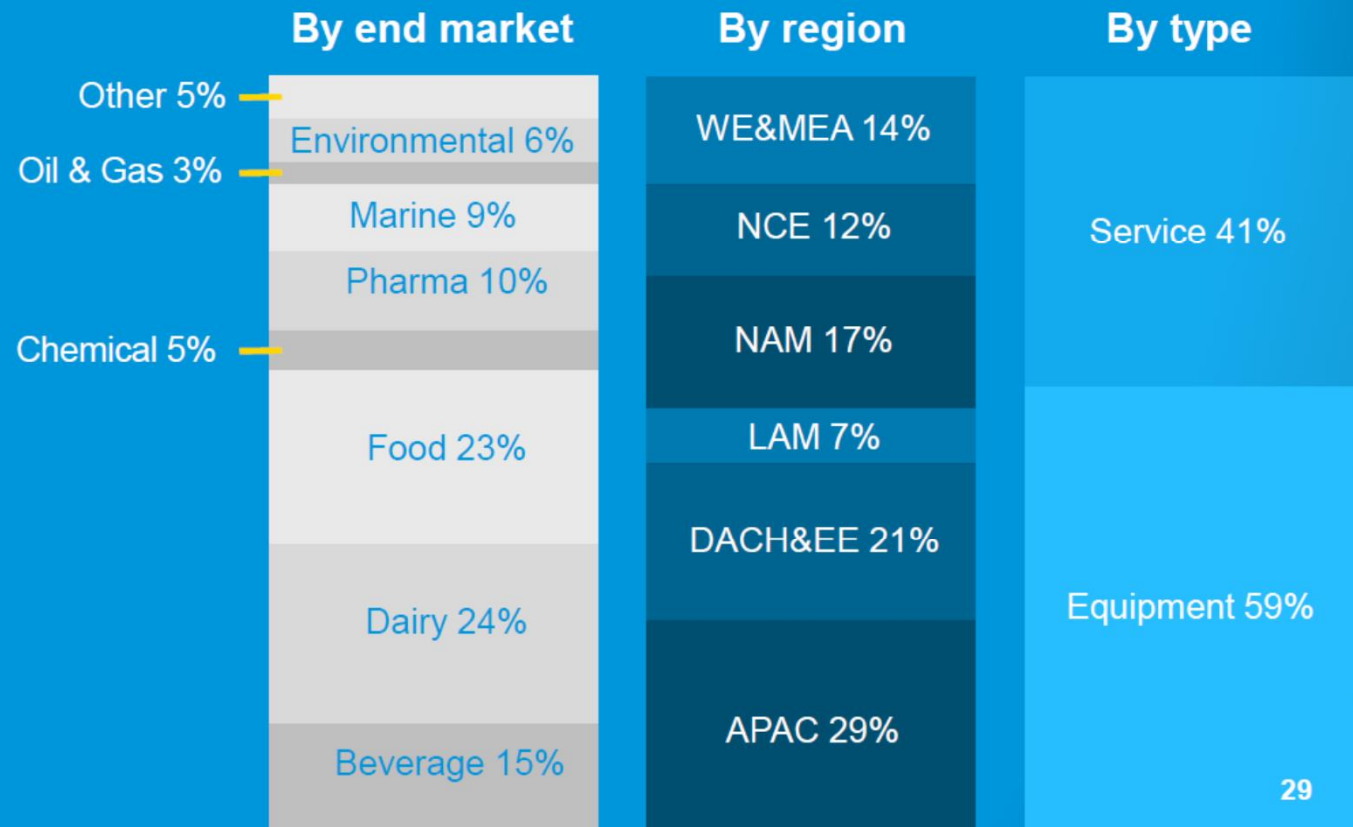
¹ EBITDA includes ~€12m IFRS16 effect based on extrapolation June 2019 YTD

² Calculation based on capital employed L4Q as per Q2 2019 including IFRS 16 pro forma for Q3 & Q4 2018

³ FTE based on Q2 2019

Sales Breakdown LTM (Q2 2019)

*Due to rounding, marginal
deviations may occur.*



Siebtechnik -TEMA

Ownership –STAFAG Holdings

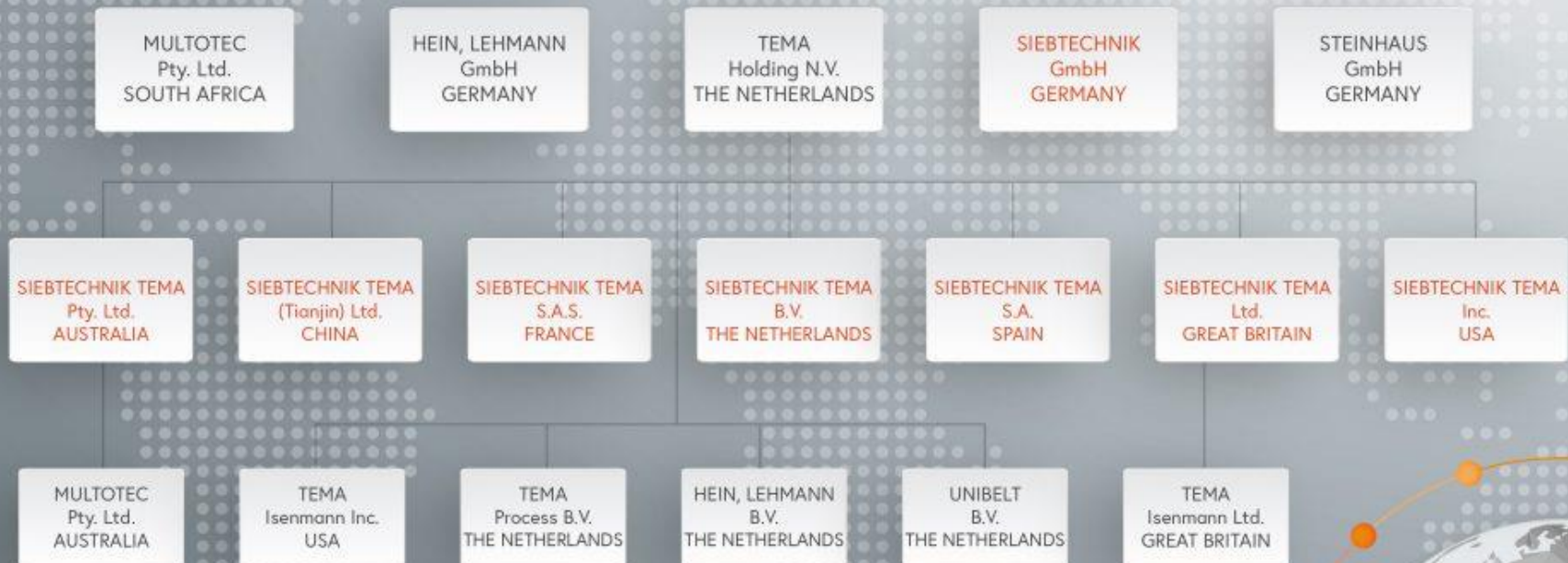


SIEBTECHNIK TEMA is part of a globally operating group of companies with around 3,500 employees in more than 50 companies with a clear focus on the processing of mineral bulk solids as well as solid-liquid separation in the chemical and food industries.

A company policy of controlled, self-financed growth, which has been consistently implemented in almost 100 years of company history, not only ensures a healthy economic base and an exceptionally good strategic position, but also an impressive worldwide presence. We see the challenges of the globalized world market as an opportunity for further positive corporate development.



Group of Companies



Centrifuge Designs

Filtration Centrifuges

- “ CONTURBEX screen worm centrifuge
- “ SHS pusher centrifuge
- “ TURBOCASCADE sliding centrifuge
- “ HSG vibrating centrifuge

Sedimentation Centrifuges

- “ Sedimentation Centrifuges
- “ Decanter centrifuge
- “ TWINCONE decanter centrifuge
- “ SHORTBOWL decanter centrifuge

Combination Centrifuges

- “ Combination centrifuges
- “ TURBOSCREEN screen decanter
- “ CONTHICK screen decanter





West Pro



West Petro

- “ As the original manufacturer of decanter centrifuge, XBSY / West Petro has designed and produced 4 main decanters over 10 models. The 4 Main decanters are RFD decanter centrifuge, VFD decanter centrifuge, HBLW 3-phase decanter centrifuge and Hydraulic decanter centrifuge.
- “ Among these four different decanter centrifuges, there are LW350*1257-N, Rate freq. LW520×1320-N, Rate freq. LW520 × 1924-N, Variable freq. LW520×1320BP-N / Variable freq. LW520×1924BP-N, LW450 decanter centrifuge, LW630 decanter centrifuge, etc.
- “ XBSY decanter centrifuge is used as a drilling mud centrifuge, oilfield centrifuge, gold ore separation centrifuge, crude oil centrifuge, waste lube centrifuge, oil separation centrifuge, lubricants centrifuge, waste oil separation centrifuge.
- “ They have 2 or 3 phase, RFD, VFD, FHD types of centrifuges used in many oilfields of many countries rig sites or drilling companies to treat and separate drilling mud, or refinery factory to separate waste oil sludge.
- “ Also their centrifuges can be used in oilfields waste treatment and separation, such as slope oil recovery, slope oil separation, slope oil water separation, crude oil recovery, crude oil separation, crude oil water separation, waste oil separation, waste oil recovery, waste lube recovery, waste lube separation, lubrication oil separation, lubrication oil recovery, lubricants recovery, lubricants separation.
- “ Sells 200 centrifuges per year and has over 20 years of experience



West-Petro – Food Applications

- “ Corn, cassava, rice and wheat are the most widely used raw materials in the food fermentation industry. Due to the high efficiency, stability and environmental protection of centrifuge dewatering, the use of centrifuge dewatering technology in the food fermentation industry provides protection for efficient dehydration and energy conservation of subsequent processes. XBSY (WestPetro) Beverage & Food centrifuges are considered to be an effective solution for multiple applications in Beverage & Food industry.
- “ The Beverage & Food industry centrifuges widely used in many fields, XBSY factory designs 2 or 3 phase VFD type centrifuges specially used to extract and separate fish, ethanol, palm oil, olive oil, vegetable oil, tea, VCO, fruit juice, avocado oil, protein, plant milk, vegetable milk, vegetable juice.
- “ Also most of centrifuges are usually used for vegetable oil process, protein process, starch process, tea process, soybean process, palm oil recovery, palm oil water separation, palm oil separation, olive oil recovery, olive oil separation, olive oil water separation, plant oil separation, plant oil recovery, vegetable oil recovery, vegetable oil separation, VCO recovery, VCO separation, virgin coconut oil separation, virgin coconut oil recovery, avocado oil recovery, avocado oil separation, protein separation, protein water separation, starch separation, plant milk recovery, vegetable milk recovery, vegetable milk separation, plant milk separation, soy milk separation, soy milk recovery, coconut milk recovery, coconut milk separation, grain milk separation, grain milk recovery, rice milk recovery , rice milk separation, tea extract separation, bacteria-removing separation, fruit juice separation ,vegetable juice separation.



Other West Petro Applications

- “ Wastewater or waste sludge treatment and separation. Its main body uses SS304 or SS321 materials, high standard production process, high technology support with high capacity, easy maintenance
- “ Pharmaceutical -- XBSY high speed sanitary decanter centrifuge has been widely used in the pharmaceutical food industry.
- “ XBSY (West-Petro) centrifuges are designed & developed and manufactured by its own factory, Chengdu, China. Materials used in in pharmaceutical industry are SS304 or SS321
- “ Also makes pumps, shale shaker screens, dryers and desanders which combine cyclones and screens
- “ Address
- “ No. 1355, Longgong south Road, Longquanyi District, Chengdu, Sichuan Province, P.R. China
- “ **Post Code:**
- “ 610000
- “ <https://www.west-petro.com/contact-us/>

