



Expect Essentials



Systems according to ASTM



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Dr. H.-E. Koenen
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Engineering, Design,
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i-FISCHER® Engineering GmbH was launched on April 3, 2001 as a partnership between Intermass Fischer Asia Pte Ltd./ Singapore, Dr. H.-E. Koenen/Germany/Thailand/Singapore and ILUDEST Destillationsanlagen GmbH/Germany. Our motto "expect essentials" reflects a promise to our prospective clients on what can be expected from this well-established joint venture team for design of Process Engineering Systems and Pilot Plants for the Petrochemical Industry. After more than 50 successful installations all over the world and the incorporation of the assets and famous landmarks of FISCHER® technology, FISCHER®, LABODEST®, AUTODEST® and SPALTROHR®, we contently look back on a remarkable development during the past years of business operations. We'd like to take the opportunity to express our sincere thanks to our customers who trusted in our expertise and capabilities, and to guarantee continuation and improvement of our successful formula and world-wide service network for the benefit of our customers.

Waldbuettelbrunn, July 2005



AUTODEST®

LABODEST®

SPALTROHR®

DIST D-2892/ 5236 MC

Combined Distillation System according to
ASTM D-2892 (TBP)
ASTM D-5236 (Potstill)

Technical Data

- Operation Temperature: IBP ... 575°C
AET (depending on product)
- Operation Pressure: 0.1 ... 760 mmHg
(Torr)
- Fraction collector: 6 x 12 receivers,
heated by IR-radiators

Design Essentials

- operation through PC and flow chart
(process parameters are indicated digi-
tally and are presented in coloured
curves as a diagram "parameter vs.
time") – easy unit management also
by less experienced operators
- user-software application operated
under WINDOWS™XP
- "log-book" with permanent data
report and data storage
- reported history of distillation
processes
- storage of distillation processes with
parameters and data, limited by OS
("operator system") only
- pre-selectable heating modes, e.g.
indirect/direct distillation rate control
- automatic fraction/receiver changes
according to pre-selected cut tempera-
tures and/or receiver overfilling

- "supervisory"-mode for manual over-
ruling of automatic control mode –
with indication of every manual inter-
vention in the flow chart
=> manual operation of the unit (in eme-
rgency cases or for maintenance etc.)
=> manual receiver change
- semi-automatic / manual debutani-
sation procedure
- manual cooling down procedure after
a distillation run
- integrated UPS-system for PC, control
system for data storage up to
10 minutes during a power failure
- sophisticated vacuum control with
dynamic vacuum reduction procedure
- sophisticated safety and product
cracking checks
- media supply check (nitrogen, instru-
mentation air, cooling water)
- various options available: e.g. "water
removal/dehydration", "density measu-
rement", "safety devices", "calibration
devices", "evaluation software", "high
vacuum extension (final cut range up
to 620°...650°C AET)"



expect essentials

The i-Fischer® Dist D-2892 / 5236 MC is a micro-processor controlled unit of turn-key design, and ready for use after installation and commissioning. The system is fully housed and equipped with doors in the front and rear to satisfy safety requirements and to facilitate service aspects. The automatic fraction collector, the vacuum equipment and the control system are used for alternative operation of both distillation processes.

FISCHER
Engineering

DIST D-2892/ 5236 CC

Computer Controlled-Combined Distillation System according to
ASTM D-2892 (TBP)
ASTM D-5236 (Potstill)

The i-Fischer® Dist D-2892 / 5236 CC is a fully computer controlled unit of turn-key design, and ready for use after installation and commissioning. The system is fully housed and equipped with doors in the front and rear to satisfy safety requirements and to facilitate service aspects.

The automatic fraction collector (in the system section TBP: with 20 receivers) includes a built-in internal balance for the determination of the fraction weight, while the separate volume follower system is used for discharging the fractions into the final recei-

vers and the determination of the fraction volume as well as for the direct distillation rate control.

The automatic fraction collector (in the system section Potstill: with 12 receivers) includes a built-in internal balance and volume follower system, which is used for the simultaneous determination of the fraction weight, volume and for the direct distillation rate control.

The vacuum equipment and the control system are used for alternative operation of both distillation processes.





expect essentials

Technical Data

- ▲ Operation Temperature: IBP ... 575°C AET (depending on product)
- ▲ Operation Pressure: 0.1 ... 760 mmHg (Torr)
- ▲ Fraction collector: 20 receivers (TBP) 12 receivers, heated by IR-radiators (Potstill)

Design Essentials

- ▲ operation through PC and flow chart (process parameters are indicated digitally and are presented in coloured curves as a diagram "parameter vs. time") – easy unit management also by less experienced operators
- ▲ user-software application operated under WINDOWS™XP
- ▲ "log-book" with permanent data report and data storage
- ▲ reported history of distillation processes
- ▲ storage of distillation processes with parameters and data, limited by OS ("operator system") only
- ▲ pre-selectable heating modes, e.g. indirect/direct distillation rate control
- ▲ fully automatic fraction discharge into final receivers without any disturbance of the column equilibrium

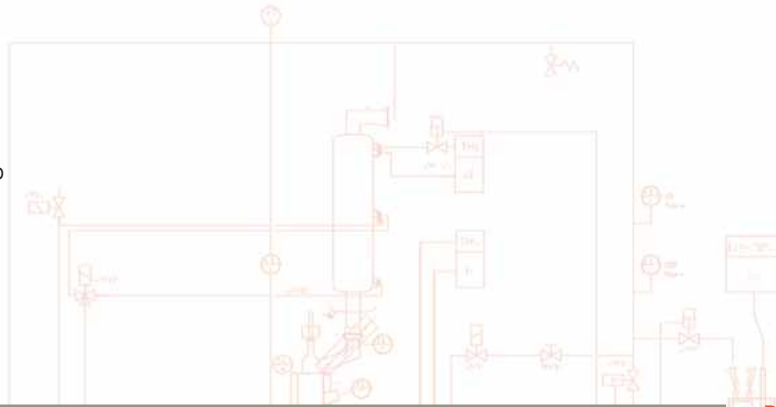
- ▲ automatic closing of the final receivers (TBP section only)
- ▲ automatic fraction/receiver changes according to pre-selected cut temperatures and/or receiver volume
- ▲ determination of fraction volumes and weights by built-in volume follower system and internal balance
- ▲ "supervisory"-mode for manual overruling of automatic control mode – with indication of every manual intervention in the flow chart
- => manual/semi-automatic operation of the unit (in emergency cases or for maintenance etc.)
- => manual receiver change
- ▲ automatic debutanisation procedure
- ▲ automatic continuation of the TBP-process, e.g. with the next vacuum run to be effected
- ▲ automatic cooling down procedure after a distillation run
- ▲ programmable washing/cleaning runs for different solvents
- ▲ evaluation of final data and TBP-curve
- ▲ electrical lifts for heating jackets
- ▲ integrated UPS-system for PC, control system for data storage up to 10 minutes during a power failure

- ▲ sophisticated vacuum control with dynamic vacuum reduction procedure
- ▲ sophisticated safety and product cracking checks
- ▲ media supply check (nitrogen, instrumentation air, cooling water)
- ▲ all alarms & safety checks with attended/unattended mode
- ▲ various options available: e.g. "water removal/dehydration", "density measurement", "safety devices", "calibration devices", "high vacuum extension (final cut range up to 620...650°C AET)", "software extension 2x 20 receivers for collecting narrow cuts"

FISCHER[®]
Engineering

DIST D-2892 CC

Fully Computer Controlled-Distillation System according to
ASTM D-2892 (TBP)



Design Essentials

- operation through PC and flow chart (process parameters are indicated digitally and are presented in coloured curves as a diagram "parameter vs. time") – easy unit management also by less experienced operators
 - user-software application operated under WINDOWS™XP
 - "log-book" with permanent data report and data storage
 - reported history of distillation processes
 - storage of distillation processes with parameters and data, limited by OS ("operator system") only
 - pre-selectable heating modes, e.g. indirect/direct distillation rate control
 - fully automatic fraction discharge into final receivers without any disturbance of the column equilibrium
 - automatic dosing of the final receivers
 - automatic fraction/receiver changes according to pre-selected cut temperatures and/or receiver volume
 - determination of fraction volumes and weights by built-in volume follower system and internal balance
 - "supervisory"-mode for manual overruling of automatic control mode – with indication of every manual intervention in the flow chart
- => manual/semi-automatic operation of the unit (in emergency cases or for maintenance etc.)
- => manual receiver change
- automatic debutanisation procedure
 - automatic continuation of process, e.g. with the next vacuum run to be effected
 - automatic cooling down procedure after a distillation run
 - programmable washing/cleaning runs for different solvents
 - evaluation of final data and TBP-curve
 - electrical lift for heating jacket
 - integrated UPS-system for PC, control system for data storage up to 10 minutes during a power failure
 - sophisticated vacuum control with dynamic vacuum reduction procedure
 - sophisticated safety and product cracking checks
 - media supply check (nitrogen, instrumentation air, cooling water)
 - all alarms & safety checks with attended/unattended mode
 - various options available: e.g. "water removal/dehydration", "density measurement", "safety devices", "calibration devices", "software extension 2x 20 receivers for collecting narrow cuts"

Technical Data

- Operation Temperature: IBP ... 420°C AET (depending on product)
- Operation Pressure: 1 ... 760 mmHg (Torr)
- Fraction collector: 20 receivers (2x 20 receivers / optional)



expect essentials

The i-Fischer® Dist D-2892 CC is a fully computer controlled unit of turn-key design, and ready for use after installation and commissioning. The system is fully housed and equipped with doors in the front and rear to satisfy safety requirements and to facilitate service aspects. The automatic fraction collector with 20 receivers includes a built-in internal balance for the determination of the fraction weight, while the separate volume follower system is used for discharging the fractions into the final receivers and the determination of the fraction volume as well as for the direct distillation rate control. The vacuum equipment and the control system are designed for highest accuracy, repeatability and reproducibility of data.





DIST D-5236 CC

Fully Computer Controlled-Distillation System according to **ASTM D-5236 (Potstill)**

Technical Data

- ▲ Operation Temperature: IBP ... 575°C AET (depending on product)
- ▲ Operation Pressure: 0.1 ... 760 mmHg (Torr)
- ▲ Fraction collector: 12 receivers

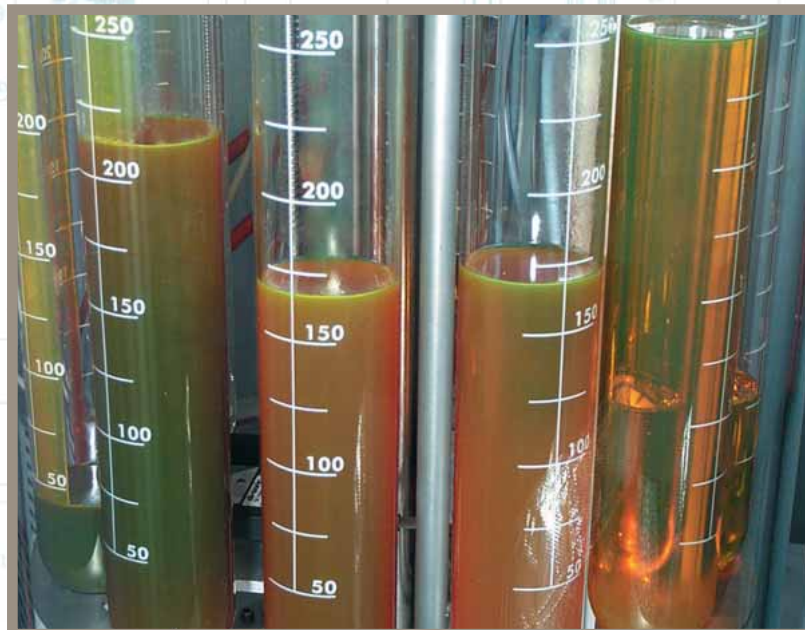
Design Essentials

- ▲ operation through PC and flow chart (process parameters are indicated digitally and are presented in coloured curves as a diagram "parameter vs. time") – easy unit management also by less experienced operators
- ▲ user-software application operated under WINDOWS™XP
- ▲ "log-book" with permanent data report and data storage
- ▲ reported history of distillation processes
- ▲ storage of distillation processes with parameters and data, limited by OS ("operator system") only
- ▲ pre-selectable heating modes, e.g. indirect/direct distillation rate control

- ▲ fully automatic fraction discharge without any disturbance of the process equilibrium
- ▲ automatic fraction/receiver changes according to pre-selected cut temperatures and/or receiver volume

- ▲ determination of fraction volumes and weights by built-in volume follower system and internal balance
- ▲ "supervisory" -mode for manual overruling of automatic control mode – with indication of every manual intervention in the flow chart

- => manual/semi-automatic operation of the unit (in emergency cases or for maintenance etc.)
- => manual receiver change
- ▲ automatic cooling down procedure after a distillation run
- ▲ programmable washing/cleaning runs for different solvents
- ▲ evaluation of final data and TBP-curve
- ▲ electrical lift for heating jacket
- ▲ integrated UPS-system for PC, control system for data storage up to 10 minutes during a power failure
- ▲ sophisticated vacuum control with dynamic vacuum reduction procedure
- ▲ sophisticated safety and product cracking checks
- ▲ media supply check (nitrogen, instrumentation air, cooling water)
- ▲ all alarms & safety checks with attended/unattended mode
- ▲ various options available: e.g. "safety devices", "calibration devices", "high vacuum extension (final cut range up to 620°...650°C AET)"





expect essentials

The i-Fischer® Dist D-5236 CC is a fully computer controlled unit of turn-key design, and ready for use after installation and commissioning. The system is fully housed and equipped with doors in the front and rear to satisfy safety requirements and to facilitate service aspects.

The automatic fraction collector with 12 receivers includes a built-in internal balance and volume follower system, which is used for the simultaneous determination of the fraction weight, volume and for the direct distillation rate control.

The vacuum equipment and the control system are designed for highest accuracy, repeatability and reproducibility of data.



FISCHER[®]
Engineering

DIST D-1160 CC

Fully Computer Controlled-Boiling Analysis acc. to
ASTM D-1160

Technical Data

- Operation Temperature: max. 400°C
- Boiling Range: max. 600°C AET (depending on product)
- Operation Pressure Range: 0.1 ... 760 mmHg (Torr)
- Operation Pressure (standard): 1 mmHg (Torr)

Design Essentials

- operation through PC and flow chart (process parameters are indicated digitally and are presented in coloured curves as a diagram "parameter vs. time") – easy unit management also by less experienced operators
- user-software application operated under WINDOWS™XP
- calculation of the distillation data and monitoring and printing of the distillation curves, boiling temperatures (ACT and AET), charge temperatures, distillation rate versus the yield (vol.-%)

- recalling of distillation protocols and curves at any time
- automatic calibration of volume measuring system delivers accurate, detailed distillation data, precise volume measurement by high-precision stepper motor
- calculation of charge to be filled into the flask in accordance to the receiver temperature and the charge density
- automatic anti-foaming procedure
- automatic washing/cleaning program procedure
- sophisticated vacuum control, accuracy better than required by ASTM
- automatic shut down procedure (cooling phase, ventilation etc.)
- heating- and distillation rate automatically controlled
- detection of IBP through optical sensor
- unit is provided with safety alarms
- devices for calibration of temperature sensors and vacuum sensor
- RS232 interface for connection to LIMS-software
- extended operation range – unit can be operated at atmospheric condition and under vacuum, e.g. pre-distillation at atmospheric & continuous distillation under vacuum acc. to ASTM D-1160
- boiling analysis of blended samples, containing light boiling products
- "supervisory"-mode for manual overruling of automatic control mode – with indication of every manual intervention in the flow chart
=> manual/semi-automatic operation of the unit (in emergency cases or for maintenance etc.)

The i-Fischer® Dist D-1160 CC is a fully computer controlled unit of turn-key design, and ready for use after installation and commissioning. The unit extends the current test method and does not limit your vacuum distillation testing options. You are able to define your own tailored program also beyond the current standard. The system is fully housed and equipped

safety requirements and to facilitate service aspects. The protocol is printed out simultaneously to the distillation and the distillation curves in actual boiling temperatures (ACT) and atmospheric equivalent temperatures (AET) as well as essential distillation parameters are shown on the monitor. The final data and the distillation curves are printed and stored on harddisk and/or data disks.



Customers List (extract)

BASF AG, Ludwigshafen/Germany
Bashneft Refinery, Russia
Chiang Mai University, Thailand
Dagang Refinery, China
Daqing Refinery, China
Dushanzi Refinery, China
Esfahan University, Iran
Hanoi National University, Vietnam
Hyundai Oil, Daesan/Korea
Kochi Refinery Ltd, India
LG-Caltex Oil Corporation, Seoul/Korea
Mahasarakham University, Thailand
National Petrochemical Public Company Ltd, Thailand
NATREF, Sasolburg/South Africa
OAO ANK, Bashneft/Russia
OAO PetroKasahstan Oil Products, Shimkent/Kasahstan
Palm Oil Research Institute, Thailand
PETROSA SA., Mossel Bay/South Africa
PORIM, Malaysia

Process Integration & Technologies, Lyon/France
PTT, Bangkok/Thailand
Raffineria AGIP di Taranto, Bari/Italy
Refinery of Beijing Yanshan Co., China
RIPP SINOPEC, Beijing/China
Saudi Aramco Refinery, Jeddah/Kingdom of Saudi Arabia
Senshua International Ltd., Beijing/China
SINOPEC International Yangzi Company, China
SK Corporation, Daejeon/Korea
SK Corporation, Seoul/Korea
SK Corporation, Ulsan/Korea
STATOIL ASA, Mongstad/Norway
STATOIL R&D Center, Trondheim/Norway
Symrise, Holzminden/Germany
Universidad Tecnica Federico Santa Maria, Valparaiso/Chile
Walailak University, Nakhonrithamaraj/Thailand
Yanshan Refinery R&D-Center, China

Experience



The joint venture partners
Udo Interwies, Marhaini Ma'arof, Henry Cheong, Christine Chee, Dr. H-E Koenen, Hans Lebahn, Stefan Opis (f.l.t.r.)

What "essentials" you may expect?

- supply of maintenance and operation manuals along with delivery of the unit (wiring diagrams included)
- sales and after-sales services provided by experts from the i-Fischer Engineering network of factory trained and authorized representatives, worldwide
- design and mechanical finish according to the latest German/European production standards
- intensive customer training courses at the i-Fischer Engineering premises or on-site



Expect Essentials



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