

COMPANY PRESENTATION



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COMPANY PROFILE



To design, manufacture and commission dispensing systems for the handling of liquids of various industries is our field of activity since 1965.

German engineering at its best, FÜLL Dispensing Systems is renowned for its quality, reliability and flexibility. In over 40 years, we have installed more than 2.200 dispensing systems worldwide.

Above all we have learnt one very important thing: Each customer is special and has his specific working and production conditions and particular products. To consider that and to develop the most suitable solution taking technical and economical aspects into consideration remains our priority.

PROFILE



IN A NUTSHELL

- Dispensing Systems for Fluids since 1965
- More than 2.200 Dispensing Systems Installed Worldwide
- Standard and Customized
- Quality, Reliability, Flexibility



INDUSTRIES

- Paint Industry
- Coatings Industry
- Printing Industry
- Cosmetics
- Specialty Chemicals



APPLICATIONS

- Small to Large Scale Productions
- Upper Retail Market
- Laboratories



DISPENSING CONCEPTS

- Gravimetric Dispensing
- Volumetric Dispensing
- Mass-Flow-Meter Dispensing
- Combinations and Hybrids

FIELDS OF ACTIVITY



PAINTS AND COATINGS

- Industrial Paints
- Coil Coating
- Floor Coating
- Building Protection
- Automotive Paints
- Wood Conservation
- Dispersion Paints
- Additives
- Lacquers
- ...



CHEMICALS

- Latex
- Resins
- Adhesives
- Cosmetics
- Silicones
- Aromatic Substances
- Fragrances
- Flavours
- ...



INKS AND PACKAGING

- Solvent Based
- UV-Hardened
- Coatings Products
- Adhesives
- Preservatives
- Water Based
- Offset
- Solvent Supply Systems
- Textile Dyes
- ...

REFERENCES



INKS AND LAQUERS

BASF Coatings AG, Jotun, PPG Industries, Krautol, Sun Chemical, Hartmann DF, Hostmann Steinberg, Huber, Siegwerk DF, Jänecke & Schneemann, Flint Group, TOA Thailand etc.



CHEMICAL AND COSMETIC INDUSTRY

Amberger Kaolinwerke, BASF, Benecke Kaliko, 3M Deutschland, Fischerwerke, Hermes Schleifmittel, Orafol-Klebeteknik, REHAU AG, Henkel, Klingspor, Allergan Medical etc.



PRINT AND PACKAGING

AMCOR Flexibles, Donau-Dekor, Europa Carton, Heyne & Penke, Hueck Folien, Masa Dekor, MM Graphia, SIG Combiblock, ALCAN Packaging, Huhtamaki, Schattdecor, Herma GmbH, Beucke & Söhne etc.



MECHANICAL ENGINEERING

Betz Druckmaschinentechnik, Bison Bähre & Greten, Siempelkamp, Windmöller und Hölscher

STRENGTHS AND VALUES



QUALITY

fundamental to our thinking - from the smallest part to final commissioning



SERVICE

quick, available, measurable - from first contact to after sales



EXPERIENCE

our source of ideas – from the first dispensing system built in 1965 till today



FLEXIBILITY

small or large, standard or customized – your needs are the benchmark



EMPLOYEES

motivated, qualified and with an average employment time of 9 years



SOFTWARE

down-to-earth, intuitive, adaptable – developed and maintained in-house

GERMAN ENGINEERING AND SERVICE.
WHEREVER YOU NEED IT!



QUALITY FROM IDSTEIN / FRANKFURT. EVERYWHERE AT HOME!

Algeria · Austria · Belarus · Belgium · Bulgaria · China · Costa Rica · Croatia · Czech Republic · Denmark · Egypt · England · France · Finland
· Germany · Greece · Hungary · Ireland · Italy · Kazakhstan · Korea · Netherlands · Nigeria · Norway · Poland · Russia · Saudi Arabia · Slovakia ·
Spain · Sri Lanka · Sweden · Switzerland · Thailand · Turkey · Tunisia · Ukraine · United Arab Emirates · USA · Venezuela

THE HISTORY OF FÜLL.

MORE THAN 40 YEARS OF EXPERIENCE!

From the word go:

Werner Füll establishes the company to produce machined valves in Niedernhausen near Frankfurt, and expands on this core area

1965

A technological milestone

in the company's history:
Installation of the first automatic dispensing system

1977

New market size, new production

facilities: New in-house manufacturing and business centre allows to pre-mount complete dispensing systems almost 100% prior to delivery.

1988

Quality guaranteed:

High standards at FÜLL certified according to DIN EN ISO 9001

1997

1973

First relocation into larger business premises: FÜLL expands due to increasing order volume in tank farms and dispensing equipment

1985

IT matters: Our first unit with IT support. Workflow visualised under the state-of-the-art operating system of the time: MS DOS;

Furthermore: enhanced repeatability with needle valves for droplet dispensing

1993

System improvement, the FÜLL way: introduction of the CALIPSO (Color And Liquid Processing Software) dispensing program developed by FÜLL

Strengthened means:
The FÜLL family business
acquired by the Swiss
Perrot Duval Holding

Safe quality-peripherals:

Accreditation to manufac-
ture agitators and level
sensors compliant with
ATEX directive

Extra small: Development of the
small, automatic dispensing head
FS xs. A cost-effective option with
all advantages of the larger units.

Foundation of Füll Engineering BV

in the Netherlands; specialisation in
development and innovation of
volumetric dispensers

1999

2003

2006

2008

2000

2004

2007

2009

Improvement as a matter of
attitude: FÜLL's standards
are certified according to DIN
EN ISO 9001:2000

Electrical comfort:
FÜLL introduces servo
drives raising the stand-
ards in quick and precise
valve actuation and
positioning

**Purely gravimetric hybrid
system** with scales and mass
flow meters for automatic
dispensing of small amounts
into larger mixing tanks with-
out human intervention or
separate weighing

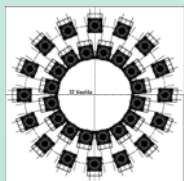
Development in practice:

- Automatic laboratory dispenser for deve-
lopment of recipes and micro dispensing
- Simultaneous volumetric dispenser for
semi-industrial applications, paint produ-
cers and professional paint stores
- Hybrid system combining gravimetric
and volumetric dispensing

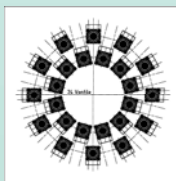
DISPENSING HEAD FS XS

Small to Medium Sized Flexible Packaging Companies

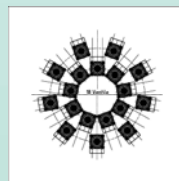
- For small to medium sized batches
- Up to 32 dispensing valves
- Valve-diameter outlet: 15 mm
- Flow rate 0,318 m³/h (for H₂O and a velocity of 0,5 m/s)
- Fixed valve plate with valves arranged in a circle



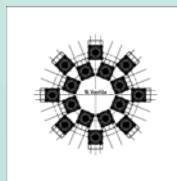
32 Valves
Ø 330 mm



24 Valves
Ø 280 mm



18 Valves
Ø 230 mm



16 Valves
Ø 210 mm

- For ex and non-ex environment
- With 30 and 60 kg-scale as standard but larger scales available



FS xs – ex-proof design

DISPENSING HEAD FS XS · PROJECT EXAMPLES



Products: Solvent based printing inks
Scale: 15 kg, $\pm 0,05$ g
Storage: 30 I-pails



Products: Water based printing inks
Scale: 1.500 kg, ± 20 g
Storage: 200 I-barrels and 1.000 I-BCs

DISPENSING HEAD FS XS · PROJECT EXAMPLES



Products: UV based printing inks
Scale: 30 kg, $\pm 0,1$ g
Storage: 200 I-barrels



Products: Water based printing inks
Scale: 60 kg, $\pm 0,4$ g
Storage: 100 I-, 200 I-barrels and 1.000 I-IBCs

DISPENSING HEAD FS 2005

Manufacturers of Paints, Additives and Inks ·
Medium and Large Flexible Packaging Companies

- ▶ For in can tinting and medium to large scale production batches
- ▶ For a number of components ≤ 32
- ▶ Different valve diameters from 20 to 65 mm
- ▶ Flow rate of 5,97 m³/h for 65 mm-valve (for H₂O and a velocity of 0,5 m/s)
- ▶ Movement of valve plate via servo drive
- ▶ Actuation of dispensing valve via servo drive
- ▶ For ex and non-ex environment
- ▶ In combination with up to 4 scales, mass flow meters or/and our volumetric system HX5



FS 2005 – ex-proof design with agitator

DISPENSING HEAD FS 2005 · PROJECT EXAMPLES



Products: UV based printing inks
Scale: 15 kg-scale
Storage: 30 I-pails



Products: Water based paints
Scale: 1.500 kg and 60 kg
Storage: Different stationary tanks

DISPENSING HEAD FS 2005 · PROJECT EXAMPLES



Products: Solvent based printing inks
Scale: 300 kg, ± 1 g
Storage: 200 l-barrels and stationary tanks



Products: Solvent based printing inks
Scale: 60 kg, $\pm 0,4$ g
Storage: Different stationary tanks

DISPENSING HEAD FS 182

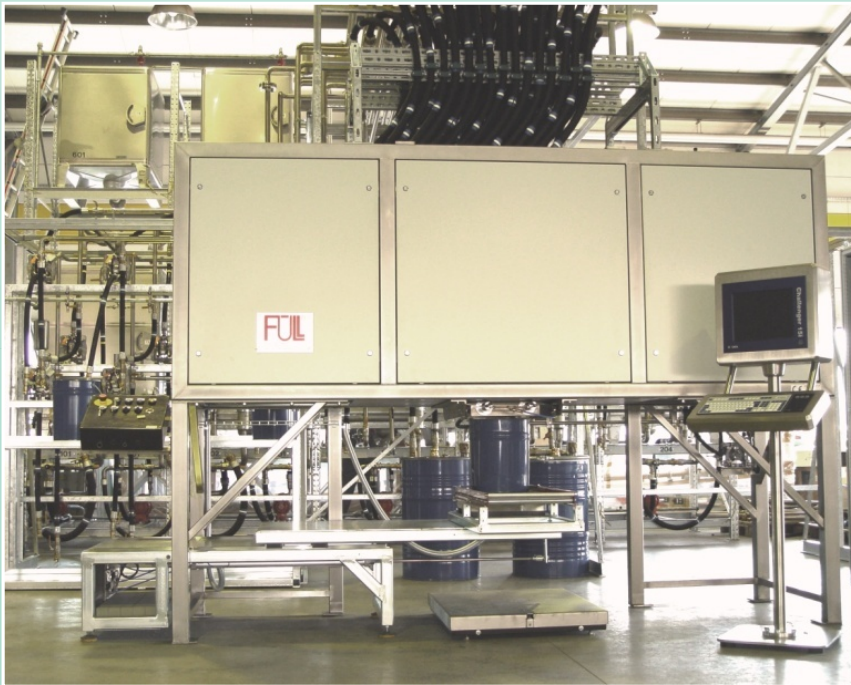
Manufacturers of Paints, Additives and Printing Inks · Medium and Large Flexible Packaging Companies

- ▶ For in can tinting and medium to large scale production batches
- ▶ For a number of components > 32
- ▶ Different valve diameters from 20 mm to 65 mm
- ▶ Flow rate of 5,97 m³/h for 65 mm-valve (for H₂O and a velocity of 0,5 m/s)
- ▶ Movement of valve plate via servo drive
- ▶ Actuation of dispensing valve via servo drive
- ▶ For ex and non-ex environment
- ▶ In combination with up to 4 scales, mass flow meters or/and our volumetric system HX5



FS 182 - with 1.500 kg-floor scale and 60 kg-scale

DISPENSING HEAD FS 182 · PROJECT EXAMPLES



Products: solvent based paints
Scale: 1.500 kg and 60 kg
Storage: barrels and stationary containers



Products: solvent based paints
Scale: 1.500 kg and 60 kg
Storage: barrels and stationary containers

DISPENSING HEAD FS 182 · PROJECT EXAMPLES



Products: solvent based printing ink
Scale: 600 kg
Storage: stationary containers



Products: solvent based paints
Scale: 1.500 kg and 60 kg
Storage: stationary containers

VX5 – SIMULTANEOUS DISPENSER

Semi-Industrial and High Volume Retail Applications

- ▶ Dispensing unit up to 18 or 32 Components
- ▶ Patented Double-Action piston pumps for double dispensing speed
- ▶ Pump capacity 1.0 – 1.5 Liter/min
- ▶ Smallest dispensing amount 0.05ml
- ▶ Accuracy $\pm 1\%^*$
- ▶ Automatic pump selector, significantly reducing wear

*) Depending on fluid rheology and dispensed amount



VX5 – Simultaneous Dispenser

VX5 – SIMULTANEOUS DISPENSER (continued)

- ▶ Integrated 5 and 12 Liter stainless steel canisters
- ▶ Interchangeable, airtight canisters with Click-Connect coupling system
- ▶ Automatic canlift with servodrive
- ▶ 100% support for the new UDCP* standard, allowing easy connection to external formulation and spectro-software



VX5 – Canister Module

*) Universal Dispenser Communication Protocol

LABORATORY DISPENSING SYSTEM

Recipe Development

- ▶ Repeatability of $\pm 0,002$ g
- ▶ Storage containers with integrated agitator
- ▶ Customized number of components
- ▶ Precision needle valve for droplet dispensing
- ▶ XYZ robot for storage container transport
- ▶ Interface to ERP software
- ▶ Interface to colormetric software
- ▶ Automatic dispensing cup handling



DISPENSING HEAD FS 188

Converters · Lamination Applications · Adhesive Manufacturers

- ▶ For continuous or batch supply of sub-sequent processes
- ▶ Highest repeatability and traceability due to gravimetric and/or mass flow meter dispensing
- ▶ Dispensing of reactive components and catalysts
- ▶ “In-flight”-change of formulations
- ▶ Bubble-free production of formulations
- ▶ Automatic cleaning cycles in case of formulation change



FS 188 - semi-continuous supply of reactive silicone components to a dip tank system for the production of silicon implants.

DISPENSING HEAD FS 188 · PROJECT EXAMPLES



Continuous supply of reactive silicone components via mass flow meters and cascade-style mixing for the production of liners for labels.



Continuous supply of lamination components via mass flow meter to a curtain coater for the production of packaging material for the food industry.

DISPENSING HEAD FS 188 · PROJECT EXAMPLES



Double unit for semi-continuous supply of lamination components into a lamination trough



Batch supply of lamination components with integrated agitator for the supply of a lamination machine.

HYBRID DISPENSING SYSTEM

Smallest Amounts into Big Batches

Industries: Paints, Additives, Resins, Flavours etc.

- ▶ Dispensing of small amounts without operator interference and separate weighing by combination of gravimetric and volumetric dispensing
- ▶ For production batches and „In-Can-Tinting“
- ▶ Continuous dispensing with optional agitation
- ▶ Time saving due to simultaneous dispensing of the small components
- ▶ No costs for cleaning and disposal of separate dispensing containers



Hybrid dispensing system for production batches



Hybrid dispensing system for „in-can-tinting“

STORAGE SYSTEMS

- ▶ Different solutions from several m³-tanks to small pails
- ▶ Direct connection of transport containers to the dispensing head or transfer into stationary tanks
- ▶ Design depending on consumption, delivery cycles, raw material characteristics etc.



Combination of 1 m³- to 5 m³-tanks and 200 l-barrels for the storage of pastes, additives and basis



20 m³- and 30 m³-tanks for the storage of resins



Combination of stationary tanks and 200 l-barrels for printing inks and additives

STORAGE SYSTEMS (continued)



Combination of transport and intermediate container



1.000 I-IBC and 200 I-barrels in horizontal installation



200 I-barrels in wall installation

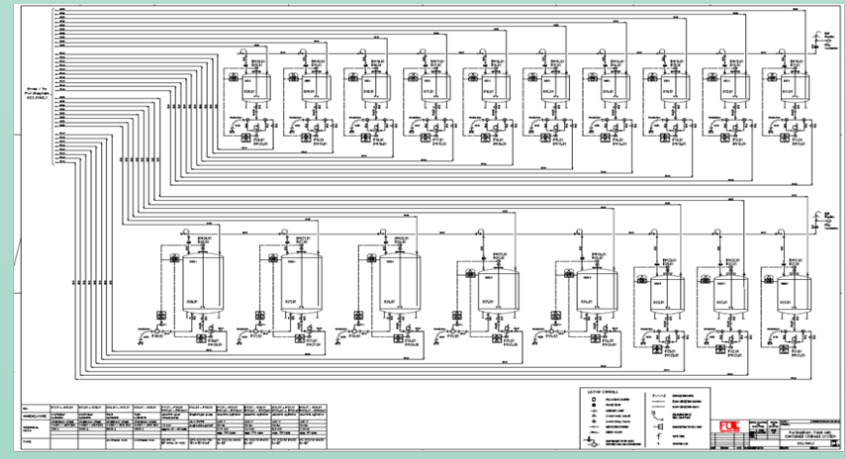
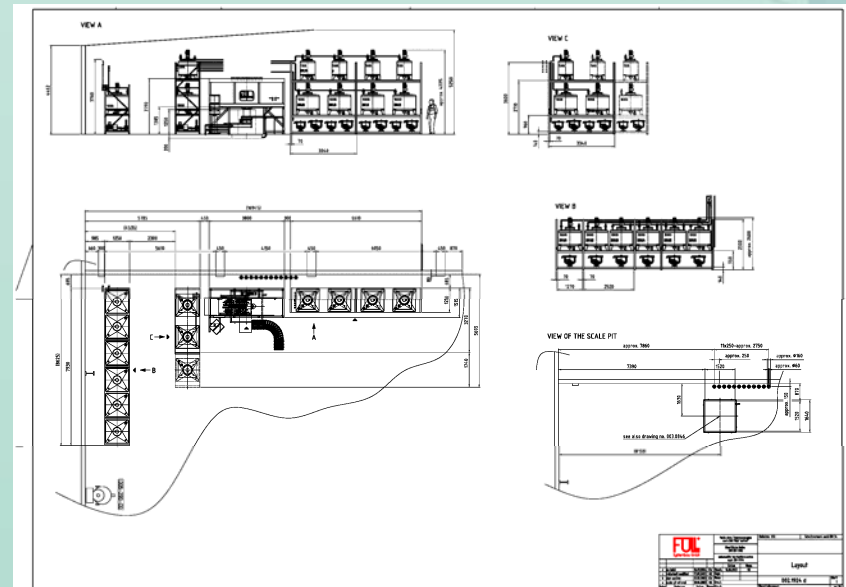


30 I-pails in two levels

ENGINEERING

- Consulting
- Planning
- Development

Ambitious projects require ambitious solutions. Füll consults and supports you from the idea to the turn-key-plant .



THANK YOU FOR YOUR INTEREST!



QUESTIONS?