

1 Introduction

1.1 Herbst - Allrounder in Mixing and Stirring

In 1874 Friedrich Herbst invented the dough dividing machine, and this was the first step in mechanising the bakery trade. More than 30.000 machines of this or a similar type have been manufactured. Figure 1 shows the company in the year 1924, when it had a staff of 350 and was still located in Halle on Saale (Eastern Germany).



Figure 1: F. Herbst & Co., Hallesche Dough Kneader and Mixing Factory, Hallesche Motor Factory in 1924

This was the beginning of the company Herbst, who today are busy not only in the food industry but also in the chemical, pharmaceutical and cosmetics industry. Everything is being mixed, like explosives, adhesives, tars, paint, flavours, fragrances, skin creams, mayonnaise, jellies, soups, and salads.

After the second world war the Herbst Family was expropriated by the communists, and they escaped to West Germany to build a new production site.

In 1997 the Herbst family sold the business. Since then, with a new management and an enlarged staff, the production has been modernised and many new designs have been developed successfully. Following the positive development of the business, new premises with a better infrastructure were found in Buxtehude, where the company now has established itself. Figure 2 shows the new company building.

More than 130 years of experience taught us how to mix all the different products in the most efficient way. Therefore, it is our aim to use this experience for our customers' individual requirements. This means that tailor-made solutions using standardised components are more important than serial production, and for the customer it definitely is a price advantage. The following table lists selective references.



Table 1: Extract from our Reference List

Company	Branch	Year
3 M, Neuss	Chemistry	1999, 2003, 2009
Abbott Laboratories Ltd., Großbritannien	Pharmacy	1999
Aeropharm (Hexal-Gruppe), Rudolstadt	Pharmacy	2003
Airbus, Hamburg	Chemistry	2005, 2008
BASF, Ludwigshafen	Chemistry	2008
Beiersdorf AG (Tesa), Hamburg	Chemistry	2000, 2003
Robert Bosch GmbH, Waiblingen	Chemistry	2008
Celanese Ventures GmbH, Frankfurt a. M.	Chemistry	2004, 2007
Cosmital (Wella-Gruppe), Schweiz	Cosmetics	2001
Erasco (Campbells), Lübeck	Food	2009
Evonik, Essen	Chemistry	2010
Framatome (Siemens-Gruppe), Erlangen	Chemistry	2002
Freudenberg, Weinheim	Chemistry	2010
Fuchs Lubritech GmbH, Weilerbach	Chemie	2008, 2009
Fuchs Petrolub AG, Mannheim	Chemistry	2005, 2008, 2009, 2010
Glaxo Smith Cline, Großbritannien	Pharmacy	2004
Biologische Heilmittel Heel GmbH, Baden-Baden	Pharmacy	2008
Henkel, Düsseldorf	Cosmetics	2006
W. C. Heraeus, Hanau	Chemistry	2006, 2007, 2008, 2010
Hipp, Pfaffenhofen	Food	1999
Johnson Matthey, Großbritannien	Chemistry	2001
Jurlique, Australien	Cosmetics	2002
Kali & Salz, Heringen	Chemistry	2006, 2008
Kisling AG (Würth-Gruppe), Schweiz	Chemistry	1999
Klüber Lubrication, München	Chemistry	2004
Kraft-Foods, München	Food	2002, 2006
Krewel Meuselbach, Eitorf	Pharmacy	2001
KVP (Bayer-Gruppe), Kiel	Pharmacy	2001, 2004, 2009
Heinrich Mack (Pfizer-Gruppe), Illertissen	Pharmacy	2002
Magmalor (Ferro), Colditz	Chemistry	2001, 2006
Nadler Feinkost GmbH, Bremerhaven	Food	2004
Nestle AG, Berlin	Food	2001
Nico Pyrotechnik, Trittau (Rheinmetall Defence)	Chemistry	2001, 2003
Osram Opto Semiconductors GmbH, Regensburg	Chemistry	2005, 2007
Philips Medical Systems DMC GmbH, Hamburg	Pharmacy	2005, 2006
Procter & Gamble	Cosmetics	2004, 2009
Rhone Poulenc, Köln	Pharmacy	2001
Saint Gobain, Frankreich	Chemistry	2008
R. P. Scherer (a Cardinal Health Company), Eberbach	Pharmacy	2004
Schwarzkopf, Hamburg	Cosmetics	2001
Setral, Frankreich	Chemistry	2006, 2008
Takasago, Zülpich	Food	1999, 2001
Varta, Ellwangen	Chemistry	2000
Wella AG, Darmstadt/Hünfeld (Procter & Gamble)	Cosmetics	2000, 2007, 2009, 2010
Wilde Cosmetics, Eltville	Cosmetics	2003, 2005, 2006, 2008
Wolff Cellulosis, Walsrode	Chemistry	1998, 2007



Figure 2: The company building of Herbst Maschinenfabrik GmbH in Buxtehude near Hamburg

Apart from our reliable planetary mixers, the product range now also includes stand mixers, central mixers, rotor-stator-systems (homogenisers) and discharge devices, thus covering the full range of mixing and stirring technology.

Planetary mixers, the stars among the mixers, are mainly used for mixing products with medium to high viscosity, such as dry powders, pastes, creams, suspensions or liquids.

Herbst-Planetary mixers are available with bowl sizes from 2 litres to more than 1000 litres, for the laboratory as well as for production.

Centrally located agitator units are as a rule installed into bowl and upright, free standing, mixing units and are foremost employed in the mixing of low viscous substances with the main component being a liquid. The standard volume ranges from 2 to 3500 ltrs. with the main components being liquid.

Rotor-Stator-Systems (Homogenisers) are an interesting addition to planetary mixers. They are used to produce finely dispersed emulsions. The product is drawn out of the bottom valve of the mixing bowl then axially sucked in by the homogeniser and radially pressed through the slots of the rotor-stator-system.

Stand mixers are very versatile. A lifting column serves as guide for a mobile slide, which in turn holds a central mixer. There are three basic models, the wall stand, floor stand and the mobile stand. The lifting movement of the slide can be operated manually, hydraulically, electrically or pneumatically. All known standard stirrers, such as propellers and dissolvers, can be used as mixing tools, but also planetary mixing tools and special shapes are possible.

The stand mixers can be extended to a complete central mixer by equipment with a tight fitting bowl lid and a mobile bowl. Vacuum and/or pressure operation will also be possible like with our planetary mixers. Of course also the variety of special accessories available for the planetary mixers can be used here, such as a rotor-stator-system (homogeniser).

Discharging a mixing bowl containing highly viscous product, such as adhesives, creams and sealing material, often is a problem which cannot be solved with normal pumps. For



such special cases, Herbst manufacture special **bowl discharge systems**, which are adjusted to the mixers and the product. Normally a piston is pressed hydraulically into the mixing bowl and evacuates the product via a bottom valve. A direct combination with a filling machine is possible.

Cleaning the mixer normally is a time consuming procedure. Therefore, Herbst take special care of an easy cleaning design of their machines. Furthermore, auxiliaries are available for automatic cleaning (CIP). A spraying system can be integrated into the bowl lid of the mixer. Hot water or cleaning agent is sprayed into the mixer by the fine spraying nozzles. The rotor-stator-system makes the cleaning liquid circulate which increases the cleaning effect and saves water.

All machine parts in contact with the product are normally made of stainless steel. Special materials or surface coatings, such as Hastelloy, Teflon, etc. are also possible, as well as mixers suitable for use in explosion zones (ATEX 94/9).

Herbst supply single machines and complete systems, as well as the electronic control technology for these mixers, from control cabinet to fully automatic control (like SPS).

All Herbst machines comply with the standards of the Chemical Employers' Liability Insurance and the GMP/FDA-rules.

Herbst offers assistance in qualification and validation formalities.

After sales service is a very important part of our company policy. For each machine supplied we offer individual commissioning and instructions for operation. For all service and repair work a service team is available.

A close customer relation is desired already from the first contact. Therefore we established an efficient sales organisation operating in Germany and in countries bordering on Germany.

In order to find the optimal solution of the mixing task for our clients, a testing facility with various types of mixers is available in Herbst's technical department for trial mixing which is mostly free of charge.

Especially smaller companies depend largely on an experienced service in the technical and processing field.

Our present policy to operate not only as manufacturers of single machines but also of complete plants will be followed up consistently in the future. For this purpose Herbst will continue to rely on their strength in mixing technology and will otherwise refer to reliable components of other renowned manufacturers, for example dosage and filling devices, as well as measuring sensors.

A highly motivated team with the respective know-how in the field of construction, mechanical engineering, electro techniques and process engineering is at the company's disposition to achieve these ambitious aims. Furthermore, we maintain close contacts with various research institutes.



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