



Introducing the Herbst Maschinenfabrik GmbH

The Herbst Maschinenfabrik was established in 1874. In more than 135 years the company has gathered vast experience and knowledge in the mixing process of the various different products as requested by our customers. It is always our aim to pass this knowledge and experience onto our customer's individual requirements. Each machine is individually designed and *tailor made* using standardised components.

The mixing machines designed and build by Herbst Maschinenfabrik GmbH cover virtually the complete range of the mixing technology up to date. A large number of our mixing machines have been supplied to customers in the Pharmaceutical, Cosmetic industry, as well as in the Chemical and Food industry (see table 1, Extract of Reference List).

Examples of mixing products:

- Adhesives, Lubricants
- Grinding medias, Sealing products
- Soldering pastes, Ceramic products
- Creams / Ointments and Lotions
- Gels, Tooth paste
- Eye shadows, Perfumes
- Fingernail gels
- Aromatics, Fruit concentrates
- Chocolate products
- Delicatessen salads, Salad dressings
- Marinades, Cream cheese
- Spice mixtures

Besides our Planetary Mixers we can also provide centrally mounted Mixers, Stand Mixers, Rotor-Stator Systems and Evacuating Systems for mixing bowls.

Planetary Mixers are usually employed for mixing medium to high viscose materials. The normal usage constellation is:

Mixing volume:	0,5 ... <u>10</u> ... <u>500</u> ... 1.000 litres
Mixer speed:	5 ... <u>30</u> ... <u>150</u> ... 300 rpm
Product viscosity:	medium to <u>high viscosity</u>
Product:	liquid / pastes / powdery

**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	Chemistry	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

The HERBST Planetary mixers are available for both laboratory and production purposes with mixing bowl sizes from 2 to 1250 litres respectively. Examples of some of our models are shown in Illustration 1.



Figure 1: Designs of Planetary Mixers
Laboratory Mixer HRV-S 7, HRV 50 (Column), HRV-S 700 HO (Stand)

The HERBST Rotor-Stator-System (homogeniser) provides an interesting and essential addition to the Planetary Mixer System when finely dispersed emulsions are being produced. The product is drawn through the valve mounted at the bottom of the mixing bowl, axially fed into the homogeniser and forced through the slots of the stator. The smallest of the HERBST-Homogeniser HI 35 is shown in Illustration 2.

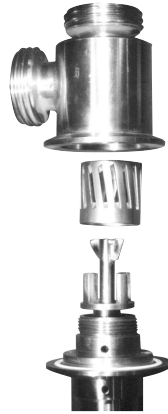


Figure 2: Homogeniser HI 35

For the mixing of low to medium viscose products mixing units with centrally mounted mixers are usually employed. These can be provided in various designs e. g. Mobile bowl Mixing Unit and Stand supported Mixing Units. The usual constellation being:

Mixing volume:	0,5 ... <u>100</u> ... <u>1.000</u> ... 5.000 litres
Mixer speed:	5 ... <u>200</u> ... <u>1000</u> ... 3000 rpm
Product viscosity:	<u>low</u> to medium viscosity
Product:	liquid

Examples of centrally mounted mixing units are shown in Illustration 3.



Figure 3: Designs of centrally mounted Mixing Units
simple Mixing Unit HRZ, Mobile Bowl Mixing Unit HRZ-M 200,
Vacuum/pressure Mixing Unit HRZVD-S 40 HO

HERBST-Stand Mixers are the most versatile of all models. A lifting column acts as a guide for the carriage carrying the actual mixing unit. There are three basic models available, these are the wall-, floor- and mobile stand units. The lifting carriage can either be operated by manual, hydraulic, electric or pneumatic means. The carriage with a centrally mounted drive may be fitted with all the standard types of mixing tools e. g. propeller, dissolver and special designs are possible. Illustration 4 shows different models.



Figure 4: Models of Stand Mixers
Wall Mounted Stand Mixer HRS-W 200, Floor Mounted Stand Mixer HRS-B 200 and Mobile Stand Mixer HRS-F 200-ex

The discharging of highly viscous products from the mixing bowl is, at times, problematic and can not be handled with the use of standard pumps. In order to overcome difficulties when discharging high viscous products as e.g. adhesives, pastes or sealing compounds HERBST has developed special mixing bowl discharging systems, which take into account the individual properties of the product, such as viscosity, flow properties etc. Usually a hydraulic operated piston of suitable material (Teflon, stainless steel, etc) is pressed into the bowl whereby the product is forced through the bottom valve or via a riser pipe into a filling machine or any other operational process. Examples of four systems are shown in Illustration 5.



Figure 5: Bowl Discharge Systems
Mixing bowl Discharging System HBE 7-15 for small size bowls, HBE 200,
mobile unit HBE-M 120, turnable unit HBE 150 SC



HERBST Mixing Units are, as a rule, delivered as a complete operable unit, i.e. with all necessary electronic controls and measuring devices, this ensures that interface compatibility problems do not arise due to components supplied by different manufacturers. Mixing Units can, on request, also be provide suitable for operation in Ex prove areas, in accordance with ATEX 94/9.

The extent of the electronic controls is in accordance with the stated requirements laid down by the customer (mixing unit operator). The standard unit is provided with a control cubical with the basic necessary control components; more complicated operating processes require more sophisticated metering and control instrumentation and technology. For a constant and precise temperature measurement an infrared transmitter can be provided.

HERBST Mixing Units are as a rule all manufactured in stainless steel. All governing safety regulations and the requirements laid down by GMP/FDA are strictly adhered to. Support for qualification and validation can be provided.

The Herbst location in Neukirchen produces bowls for the most differential applications. Presently the bowl volumes vary from 2 liters up to 10.000 liters. This volume range covers applications in laboratories as well as in the large-scale production. The bowl can be heated by means of an integrated electric heating system, by an external heating-/cooling aggregate or by steam. Both, vacuum and/or pressure can be applied within the production space. Constructions in compliance with GMP/FDA are possible and also the assistance in setting up qualification documents (IQ, OQ). The material is solely stainless steel. A few examples from our extensive production range can be viewed on the following images.

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Figure 6: Herbst Bowl Construction Neukirchen
Steam Producer, Ion Exchange, Evaporator Mixer, Packed Column