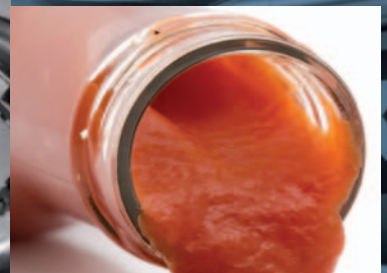
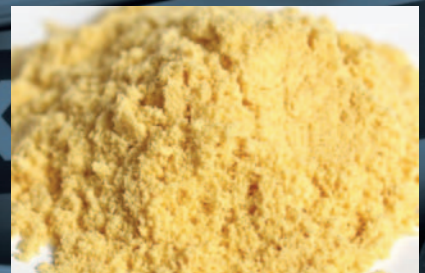
Mayonnaise, Ketchup and Sauce Preparation Systems

IKA®





Finest Sauces

Typical applications of Standard Production Plant

Sauces to suit every taste – based on this concept, IKA® application engineers have developed a versatile processing system for the preparation of a range of different sauces, such as mayonnaise or ketchup. Mayonnaise is a popular condiment that consists of oil, water and egg yolk. Different countries have various requirements for the designation of a product such as mayonnaise. In EU member states, mayonnaise must have a total fat content of at least 70 % and an egg yolk content of at least 5%. Under German delicatessen industry guidelines, salad mayonnaise must have an oil content of at least 50 %. Variants available on the market include mustard mayonnaise, tomato mayonnaise, as well as remoulades and various low calorie salad creams and dressings.

All such sauces are oil-in-water emulsions. An appropriate quantity of hydrophilic emulsifier must be added to prevent the phases from separating.

In the case of mayonnaise-type sauces, egg yolk, milk protein or vegetarian emulsifiers are generally used for this purpose. The emulsion is stabilized and the viscosity of the final product is adjusted using hydrocolloids and starches. A properly balanced recipe produces the desired mouthfeel and optimum structure.

The incorporation of additives is not sufficient to produce a high quality emulsion. Most importantly, the oil phase must be broken down into very fine droplets - just one of the requirements the IKA® process is able to satisfy very rapidly. As the IKA® system can be used to prepare products with a wide viscosity range, it is ideal for manufacturing most types of sauces.

IKA®+

For optimum and **cost-efficient** manufacturing of a broad spectrum of products IKA® has developed the Standard Production Plant SPP - a **highly versatile** and **flexible** system.

The SPP includes all components necessary for the preparation of **excellent mayonnaise, ketchup** and **sauces**.

Basic recipes

	Mayonnaise	Salad mayonnaise	Salad mayonnaise	Salad cream
Ingredients				
Oil	80 %	67 %	50 %	35 %
Egg yolk (liquid)	6 %	-	-	-
Sugar	2.6 %	2.6 %	2.6 %	2.6 %
Salt	1.3 %	1.3 %	1.3 %	1.3 %
Vinegar, 10 %	3.5 %	3.5 %	3.5 %	3.5 %
Water	6.6 %	24.4 %	40.2 %	53.7 %
All-in-one stabilizer compound*	-	1.2 %	2.4 %	3.9 %

* Compound comprising emulsifiers, hydrocolloids and optionally starches

IKA®+

Repeatedly confirmed

The SPP systems produces excellent mayonnaise and ketchup!

SPP | Components

Cleaning in Place
a minimum of three spray nozzles to ensure thorough cleaning without dead spots or shadow areas

2-bladed anchor stirrer with scrapers and flow braker
for efficient, even mixing

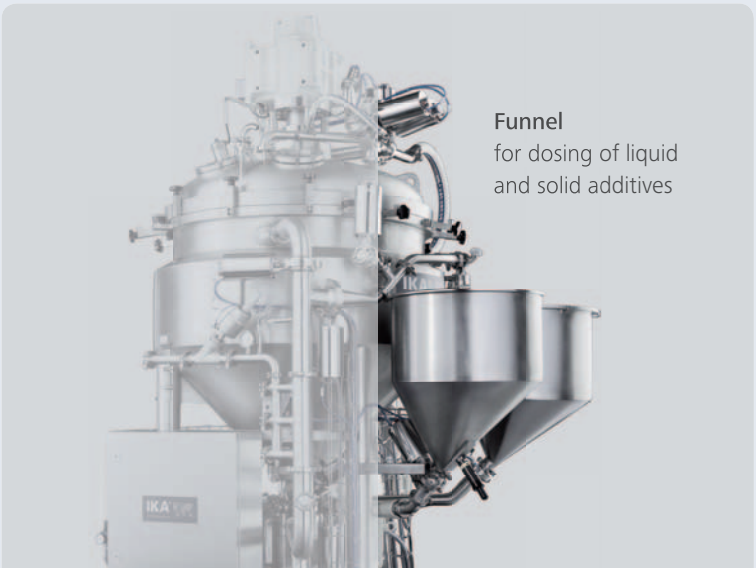
Buffer tank
for filling

Mixing vessel
the conical base ensures complete discharge of the final product

Tilting device
allows the vessel cover to be fully opened for inspection of the cleaning result

Liquid dosing
with flow meter even for heated and cooled liquids

Dispersing machine DBI
the high capacity dispersing machine DBI guarantees high-quality and stable emulsions and suspensions



Funnel
for dosing of liquid and solid additives

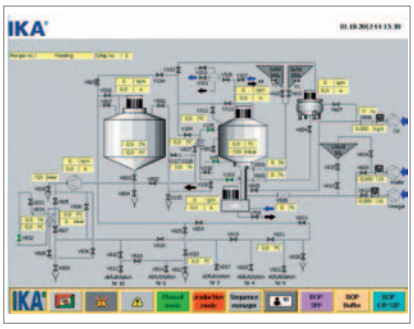
Outstanding functionality

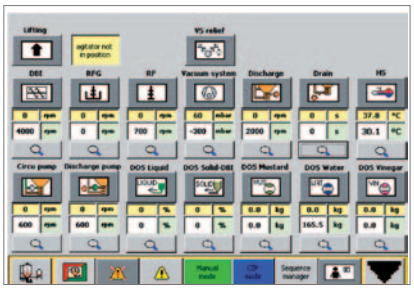
Electronic control unit

The electronic control unit is designed to meet customer requirements. It can be a version with the simple on/off button or another version, up to the most advanced PLC-Version with full visualization and touch screen. Manual operation or the full automatic program are the choices for operating the machine.

Typical control functions are as follows:

- Display of all set and acutal values
- Setting and monitoring of limit values
- Recipe management system
- Process data storage and display (trend indicator)
- Safety interlocks





Manage and save your recipes

The recipe management system uses a flow diagram, where the individual process stages can be selected as a sequence and parameter set step by step. Afterwards the complete process can be stored as a recipe and recalled for the next production.

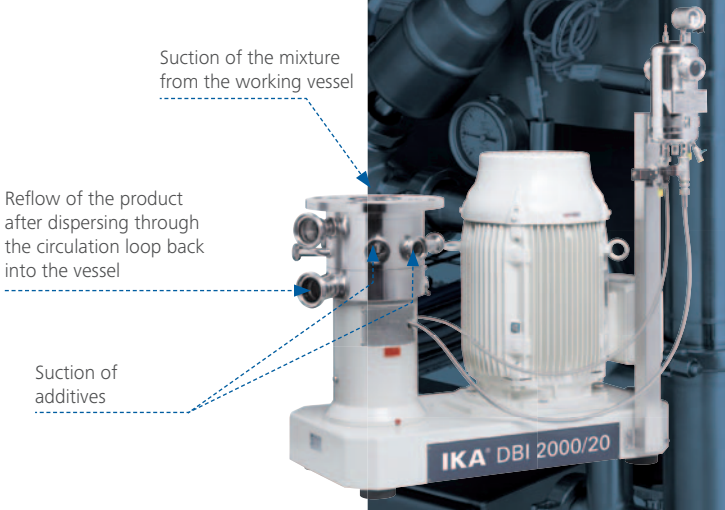
IKA® QUALITY

Advantages of the SPP:

> Very short batch times
> Consistently high product quality
> Excellent homogenization through rapid emulsification
> User-friendly operation
> Fully automated operation
> Quick and easy to clean
> Direct steam heating
> Used to manufacture a wide range of products
> Stirrer and dispersion device with speed control
> Prevention of lump formation on additive feed via DBI
> Controlled dosage rate
> Suitable for highest viscosities

Patented pump and dispersion unit DBI

This unique system combines high flow circulation, even particle size reduction and effective homogenization. Solid and liquid additives are fed directly into the dispersion chamber, which prevents lump formation and promotes rapid processing. During cleaning in place (CIP) the DBI pump stage supplies cleaning fluid in a high flow rate to the self-rotating spray nozzles and other system components.



Fast with high quality

Mayonnaise and other emulsified sauces are generally prepared cold. Some countries, however, use the semi-hot process. Here, the water phase (water, salt, sugar, mustard powder) is heated to 92 °C and then cooled back down to 30 °C. The remainder of the steps are the same as the cold preparation process.

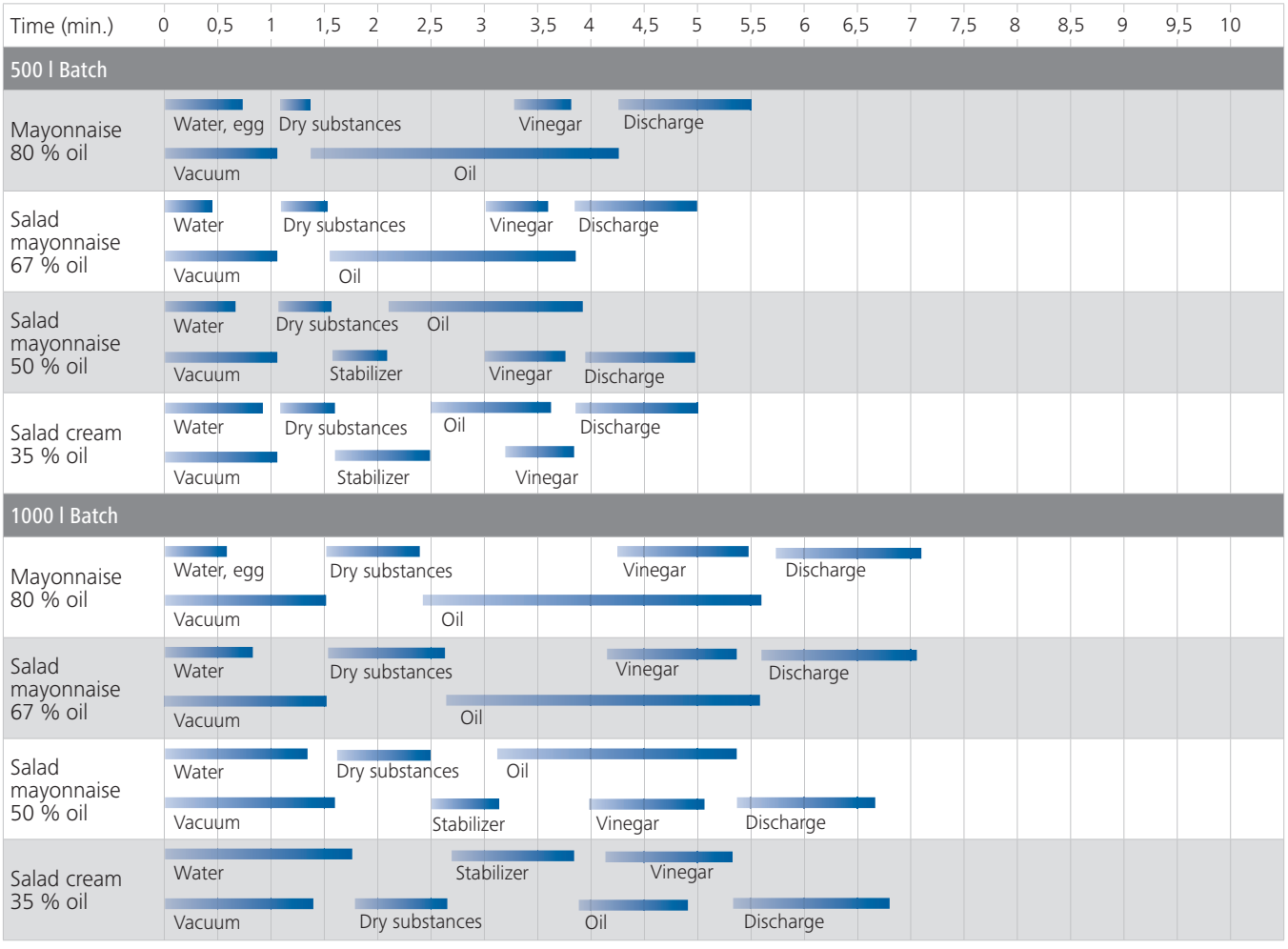
1,000 Liter Mayonnaise in only 7 Minutes!

Cold preparation:

- Supply of cold water to the processing vessel
- Dispersion of sugar, salt, emulsifiers and seasonings
- Mixing of all-in-one stabilizer compound with double the quantity of oil
- Dispersing of stabilizer-oil mixture in the processing vessel
- Emulsifiying of remaining oil
- Dispersing of vinegar and mustard with the last third of the oil
- Discharge of the product

Examples of process with times

Process parameters:
Pressure: 600 mbar abs.
DBI dispersion unit circumferential speed: 23 m/s



IKA® Scale-up

Type	SPP 25	SPP 50	SPP 100	SPP 250	SPP 500	SPP 1000	SPP 2000
Technical data							
Mixing vessel							
Min. volume [l]	8	15	30	75	150	300	600
Max. volume [l]	25	50	100	250	500	1,000	2 000
Plant capacity							
Flow rate [kg/h]			up to 1,200	1,000 - 2,200	2,000 - 3,500	2,500 - 5,000	4 000 - 5 200
Anchor stirrer							
Type	RFG-01	RFG-02	RFG-03	RFG-04	RFG-05	RFG-06	RFG-07
Rotational speed [min^{-1}]	22 to 66	18 to 54	14 to 43	11 to 32	8 to 26	7 to 20	6 to 17
Motor power [kW]	0.37	0.55	0.75	1.1	1.5	3	4
Dispersion unit							
Type	**DBI 2000/4**	**DBI 2000/4**	**DBI 2000/5**	**DBI 2000/5**	**DBI 2000/10**	**DBI 2000/20**	**DBI 2000/20**
Motor power [kW]	4	4	11	11	22	45	45
Max. flow rate dispersing [kg/h]	8,500	8,500	21,000	21,000	42,000	92,000	92,000
Dimensions							
Height (closed) [mm]	1,350	1,450	1,750	2,000	2,800	3,100	3,750
Height (open) [mm]	1,500	1,650	2,000	2,500	3,200	3,800	4,625
Width (open) [mm]	1,070	1,340	1,370	1,820	2,080	2,935	3,500
Depth [mm]	800	950	1,080	1,150	1,350	1,770	2,200

Develop – Optimize – Scale-up

IKA® introduces you to the next generation of laboratory scale process plants. The perfect simulation of the SPP system with smallest sample amounts.

The magic PLANT is specifically designed to test process and product conditions in an accurate small-scale simulation. Once a satisfactory product is obtained at the pilot scale, the next step is to transfer the manufacturing process to the full-scale production. The magic PLANT system can be adapted to a wide range of applications.

designed
to work perfectly

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