



Mayonnaise, Ketchup and Sauce Preparation Systems



Sauces to suit every taste

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 delicatesse 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.

Basic recipes

Ingredients	Mayonnaise	Salad mayonnaise	Salad mayonnaise	Salad cream
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 %	24,6 %	40,2 %	53,7 %
All-in-one stabilizer compound*	-	1,0 %	2,4 %	3,9 %

* Compound comprising emulsifiers, hydrocolloids and optionally starches

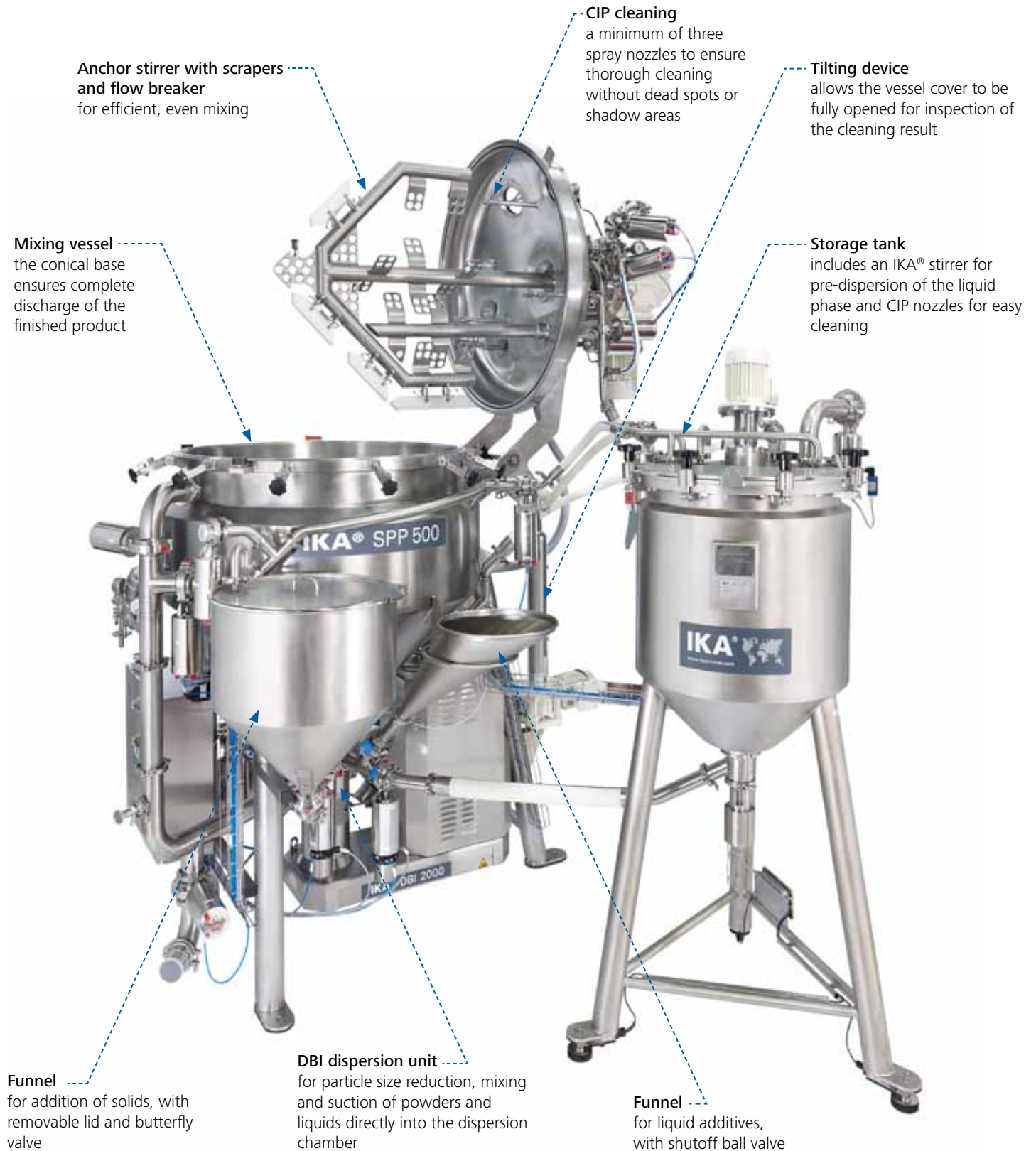


IKA® has developed the „Standard Production Plant - SPP“, a highly versatile system, ideal for optimum, cost-efficient manufacturing of a broad spectrum of products.

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

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„The SPP system makes excellent mayonnaise and ketchup!“
.....

Suitable for all recipes



Outstanding Functionality

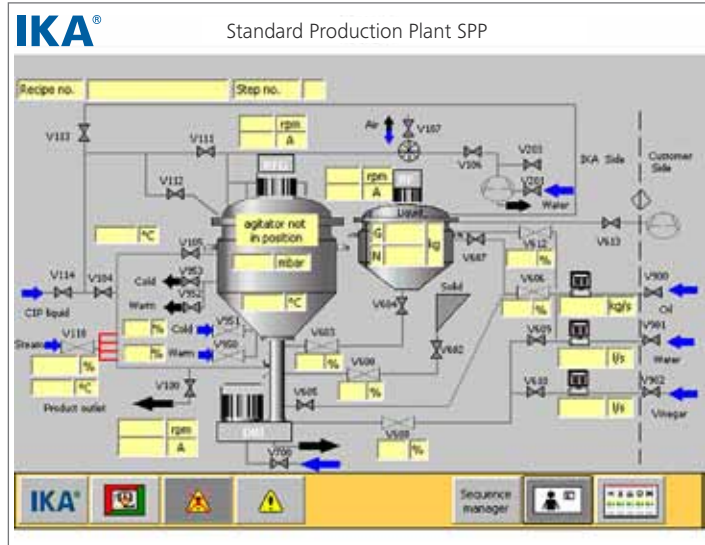
Electric control unit

The electric control unit is designed to meet customer requirements. In the highest sophisticated version, all components are controlled automatically. The unit is controlled by a modern touch screen menu system.

Functions available include the following:

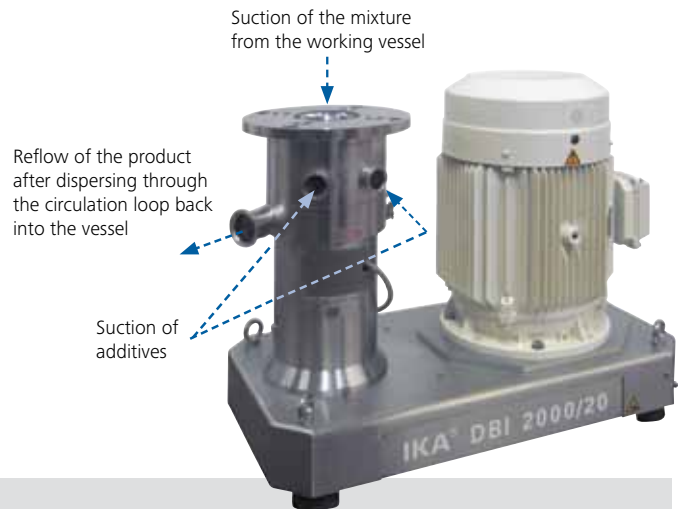
- Display of all nominal and actual values
- Setting and monitoring of limit values
- Recipe management system
- Process storage and display (trend indicator)
- Safety interlocks

The recipe management system uses a flow diagram, where the individual process stages can be selected step by step. The complete process can then be stored.



Patented DBI pump and dispersion unit

The IKA® DBI dispersion unit, specifically developed for the preparation of emulsified sauces, is flange connected directly to the base of the vessel. This unique system combines circulation, droplet and particle size reduction and effective homogenization. Solid and liquid additives are fed directly into the dispersion section which prevents lump formation and promotes rapid processing. During cleaning (CIP), the integral pump stage of the DBI supplies cleaning fluid to the self-rotating spray nozzles and other system components.



IKA® QUALITY

Advantages of the SPP:

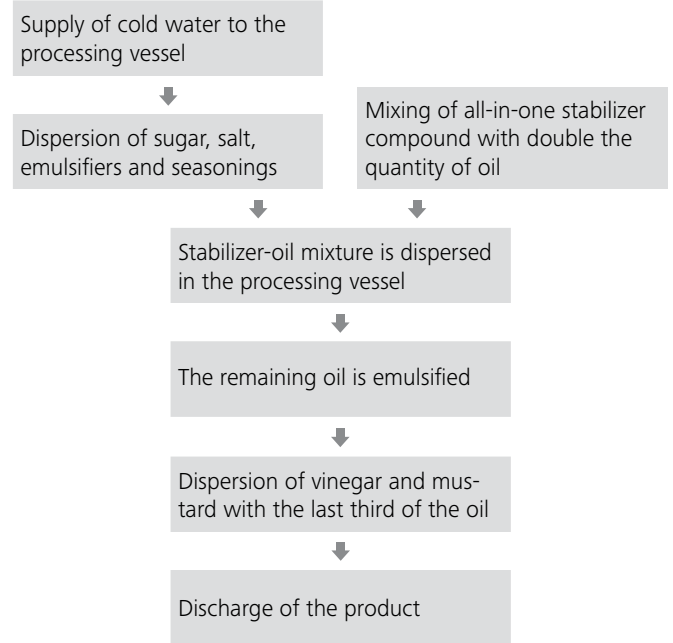
- Very short batch times
- Consistently high product quality
- Excellent homogenization through rapid emulsification
- User-friendly operation
- Fully automated operation
- Quick and easy to clean
- Direct steam heating
- Used to manufacture a wide range of products
- Stirrer and dispersion device with speed control
- Prevention of lump formation on additive feed via DBI
- Controlled dosage rate
- Small minimum volume, approx. 30 % of maximum capacity

Fast, professional preparation

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.

1000 liters of mayonnaise in just 10 minutes!

Cold preparation:

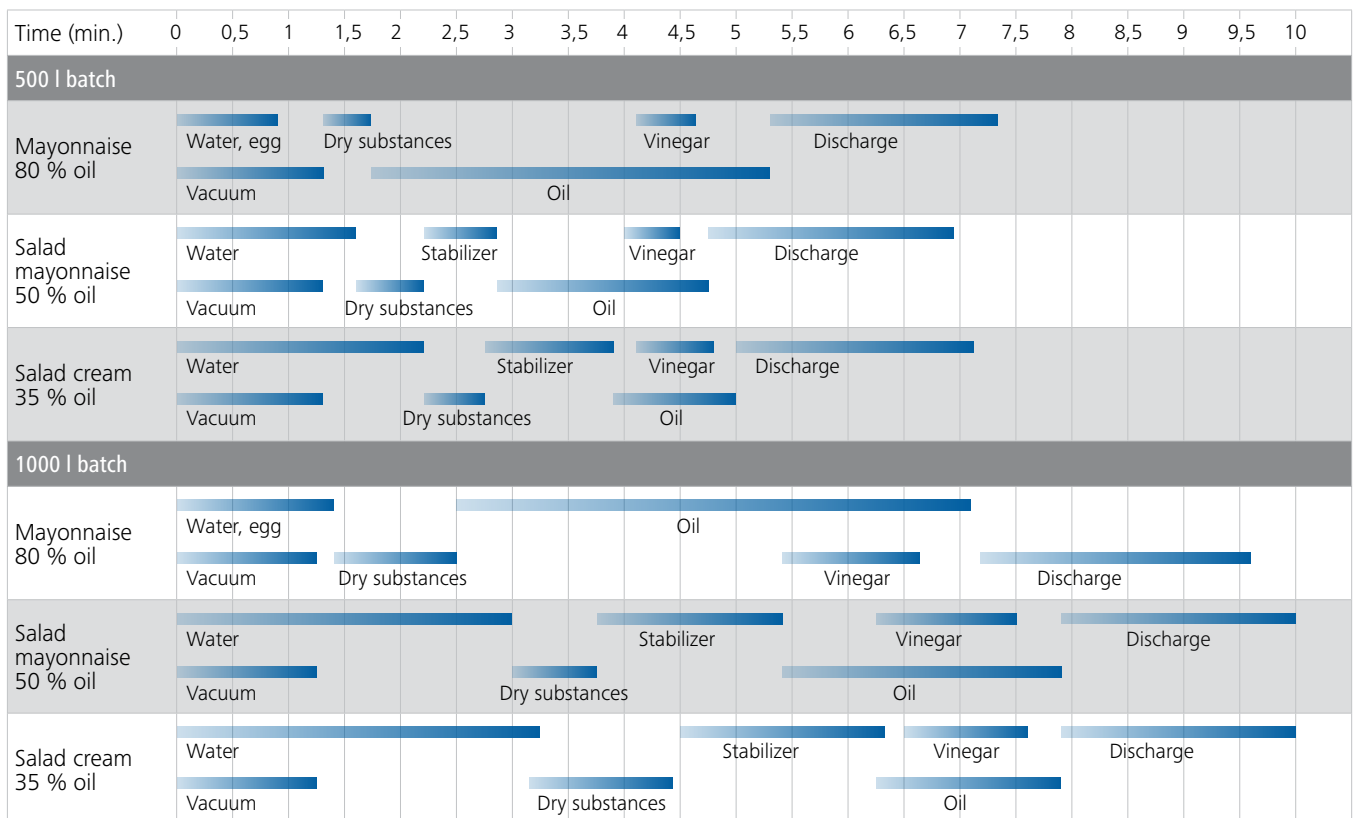


Examples of processes with times

Process parameters:

Pressure: 600 mbar abs.

DBI dispersion unit circumferential speed: 23 m/s



From pilot plant to production systems

Technical data

Type of plant	SPP 25	SPP 50	SPP 100	SPP 250	SPP 500	SPP 1000	SPP 2000
Working volume:							
Min. volume, l	8	15	30	75	150	300	600
Max. volume, l	25	50	100	250	500	1000	2000
Output parameters							
Mayonnaise plant capacity, kg/h			up to 1.200	1.000 - 2.200	2.000 - 3.500	2.500 - 5.000	4.000 - 5.200
Process parameters							
Max. temperature, °C	150	150	150	150	150	150	150
Anchor stirrer							
Motor power, kW	0,37	0,55	0,75	1,1	1,5	3	4
Rotational speed, min ⁻¹	22 - 66	18 - 54	14 - 43	10 - 32	8 - 25	6 - 20	5 - 16
Dispersion unit							
Model	DBI 2000/04	DBI 2000/04	DBI 2000/05	DBI 2000/05	DBI 2000/10	DBI 2000/20	DBI 2000/20
Motor power, kW	4	4	7,5	7,5	22	45	45
Circumferential speed, m/s	9,2 - 27,6	9,2 - 27,6	9,2 - 27,6	9,2 - 27,6	9,2 - 27,6	9,2 - 27,6	9,2 - 27,6
Max. dispersion throughput (H ₂ O), l/h	8.500	8.500	21.000	21.000	42.000	92.000	92.000
Dimensions, mm							
Height (closed)	1345	1497	1717	2005	2796	3193	3683
Height (open)	1481	1694	1998	2462	3167	3756	4549

Develop – Optimize – Scale-up

When new products are developed, the processes are first tested on pilot plants. This also applies to changes in recipes or ingredients.

For reliable scaling-up to production system level, pilot plants with a capacity of only 25 l (SPP 25) or 50 l (SPP 50) are the ideal choice. Because the design and dispersion principle are the same, all plants in the SPP series produce the same consistent emulsion quality.



A perfect addition to the SPP system is the IKA® magic LAB®, a small laboratory unit with various operating modules. For recipe development, it can be used to prepare small volumes ranging from 0.3 to 2 liters.



Designed
to work perfectly

IKA®-Werke GmbH & Co. KG · Janke & Kunkel-Str. 10 · 79219 Staufen · Germany
Tel. +49 7633 831-0 · Fax +49 7633 831-907 · process@ika.de · www.ikaprocess.com