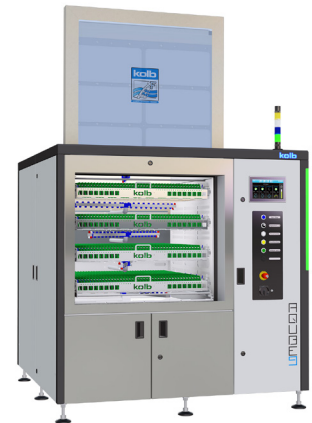


Batch or Inline?



Only a question of philosophy? Or common sense?

From time to time we are confronted with the question why **kolb** with its comprehensive know-how for cleaning systems does not offer inline systems.

We have intensively researched the inline technology already in 2007 and came to the clear conclusion that the classic inline cleaning system hardly has a future, at least in the electronics industry. That is why we decided 2008 to invest heavily in developing compact and economical batch systems with power technology and chamber sizes that can easily match or even exceed the performance of an average inline system. The today are the **kolb AQUBE® X** and **L PowerSpray®** systems with process chamber sizes and thus capacity options no other batch system manufacturer globally is capable of providing.

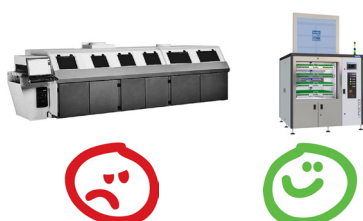
There is certainly still a reason to prefer the inline versus the batch system: In cases where a fully automatic, strict ZMM production (Zero Manual Manpower) is intended, there is no alternative to an in-line system. This means, however, that then the charge exchange of finished assemblies from the soldering unit has to be done automatically - in general this is not feasible. **In all cases, we have researched internationally all inline cleaning systems were used "stand-alone" - actually as super large batch systems.** This means:



Manual effort

The handling time and effort to transfer assemblies from the soldering line into cleaning baskets (batch) or magazines (inline) **is the same!**

The second reason why today inline systems are still considered is the still widely held view that such machines have a much higher capacity than a batch system. This is not true at least as far as the relevant **kolb** batch systems are concerned. As a benchmark we take a standard assembled eurocard 100 x 160 mm and a processing time of 90 minutes: An average inline plant cleans about during this time 555, a **kolb AQUBE® XH9** system however 830 eurocards. In detail this means:

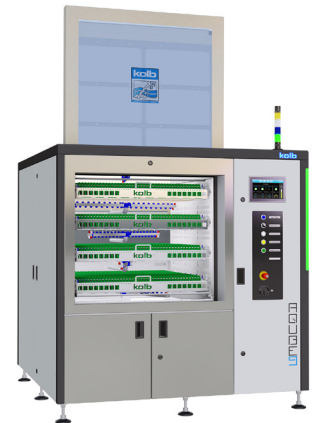


Capacity

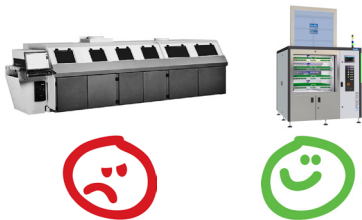
In 90 minutes, an average inline system cleans about 555 eurocards, a **kolb AQUBE® XH9** system 830. The average cleaning time per card is for inline installation at approx. 9.7 seconds, while with a **kolb AQUBE® XH9** system just 6.5 seconds. Compared to a conventional inline system: **The capacity of a kolb AQUBE® size-9 system is approximately 1.5 times larger.**



Batch or Inline?

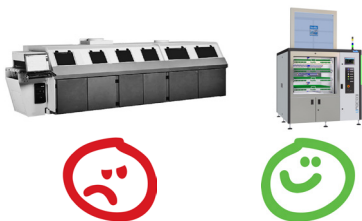


Only a question of philosophy? Or common sense?



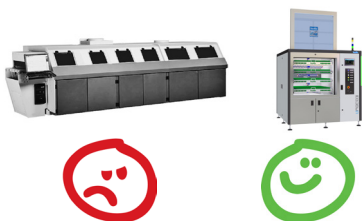
Acquisition cost

An inline system with a 6 meters process line is an investment of about 240,000 to 275,000 U\$, a **kolb AQUBE® XH9** system costs about 175,000 U\$. This means: **The acquisition cost of an average inline system are much higher!**



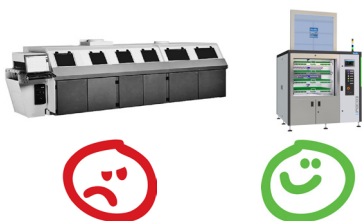
Water consumption

An inline system with a 6 meters process line consumes in 90 minutes for a maximum of 555 eurocards about 2,100 liters of water, (3,800 ml/card), a **kolb size-9** system requires for 830 cards only about 120 liters (144 ml/card). Compared to a **kolb AQUBE® XH9** system **an average inline system needs about 26 times as much water!**



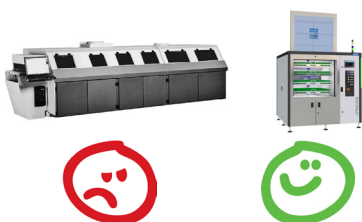
Detergent consumption

An inline system with a 6 meters process line consumes in 90 minutes for a maximum of 555 eurocards about 4,500 ml (about 8 ml per card), a **kolb size-9** system requires for 830 cards only about 600 ml (about 0,7 ml per card). Compared to a **kolb AQUBE® XH9** system **an average inline system needs about 11 times as much detergent!**



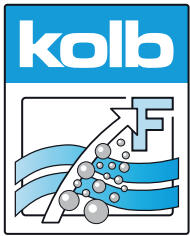
Power consumption

A common inline system with 6 meters process line, cleaning about 555 cards in 90 minutes has a power consumption of a minimum of 50 kW, a **kolb AQUBE® size-9** system for 830 cards needs only 12.5 kW. Compared to a **kolb AQUBE® XH9** system **an average inline system causes at least four times the cost of electricity!**

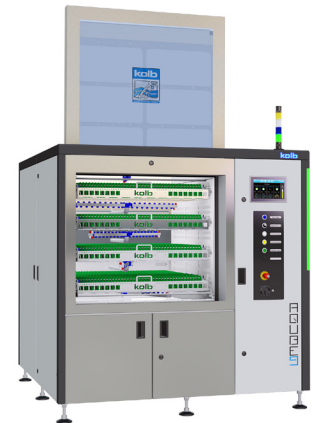


Footprint

An average inline system with 6 meters process line, cleaning about 555 eurocards in 90 minutes requires more than 10 m² floor space, any **kolb 9-size** system for 830 cards has a footprint of only 2.9 m². Compared to a **kolb AQUBE® XH9** system **an average inline system requires more than three times the set-up area!**



Batch or Inline?



A look at the total cost of ownership gives the answer.

On the previous two pages we have explained that a **kolb AQUBE® XH9** system is clearly superior to an inline electronics cleaning system concerning capacity and particularly the low total cost of ownership.

If one is only just looking for a comparable capacity and has his focus clearly on the total cost of ownership a **kolb AQUBE® XH7** system is even more lucrative.

The data at a glance:

Parameters	<ul style="list-style-type: none"> ▪ Process time: 90 minutes. Material: Assembled eurocards, 100 x 160 mm. ▪ Inline system with about 6 feet process line ▪ Same manual handling effort during loading and unloading as a for batch system 		
	Ø Inline system	kolb AQUBE® XH9	kolb AQUBE® XH7
Capacity	about 555 eurocards	830 eurocards	540 eurocards
Acquisition costs	about 275,000 USD	about 175,000 USD	about 90,000 USD
Water consumption total	about 2,100 liters	about 120 liters	about 60 liters
Water consumption per card	about 3,800 liters	about 144 milliliters	about 110 milliliters
Detergent consumption total	about 4,500 milliliters	about 600 milliliters	about 450 milliliters
Detergent consumption p. card	about 8 milliliters	about 0,7 milliliters	about 0,85 milliliters
Power consumption	(at least) 50 kilowatts	12,5 kilowatts	7,5 kilowatts
Footprint	about 10,5 m ²	about 2,9 m ²	about 1,6 m ²