CLEANING EGGS
DO'S AND DON'TS

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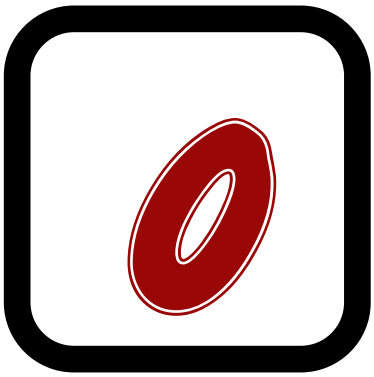

PREFACE

LIABILITY

Though this document has been put together with the utmost care, Mach-C cannot accept any responsibility for costs or damages arising from any fault and/or incompleteness in the content of this document.

GENERAL

Breeders play a crucial role in maintaining egg quality. The delivery of clean first grade hatching eggs is part of that. Dirty nest eggs are often washed at the farm, mostly combined with a disinfectant. With the proper method of washing, the washed nest eggs give nearly similar breeding results as unwashed clean nest eggs.
This document describes the proper method of washing eggs.

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1 WASHING EGGS

GUIDELINES FOR CLEAN EGGS

The most important aim of a breeder should be the prevention of dirty eggs. The quality of dirty eggs is always less than clean eggs. By washing eggs correctly, part of the lost quality can be recovered.

PREVENTION

Although it is possible to clean eggs it is always better preventing the egg from becoming dirty.
Dust, mud, faeces, feathers and contents from broken eggs may soil eggs.

- Make provisions for a clean poultry house and maintain clean nesting material.
- Use a nest with a sloping floor so eggs roll to a separate collection area and collect these eggs regularly to prevent broken eggs.
- Only allow access to the nests during the morning when most birds lay. Hens should not sleep in the nest boxes because the hens will defecate. That dirties the eggs and prevents them from rolling out, increasing the potential for breakage.
  - Place a grill or door in front of the nest boxes to keep birds out during the night.
  - Have sufficient perch space, allowing the birds to roost at night rather than sleep in nest boxes.
- Provide sufficient nest area to prevent hens from laying eggs on the floor where the eggs are easily soiled.

CLEANING EGGS

Cleaning eggs with a washing system gives good results, provided that the below guidelines are fulfilled:

1. Clean immediately after collecting the eggs.
Dirt on eggs contains a large amount of microbes. The longer the dirt stays on the eggs, the higher the chance that these microbes are able to enter the egg through the pores of the eggshell.
Collect eggs often and clean them immediately. Take into account that most eggs are laid within five hours of the first light in the morning, so collect eggs for example twice in the morning and once in the afternoon.

2. Use high quality washing water.
Only use potable water for cleaning. When using water from a water well it is recommended to examine the water by the health authority for the suitability of washing eggs. In particular high iron levels in water (from a well) impair the effect of the disinfectant. Iron compound increases the expansion of the microbes.

3. Use correct washing water temperature.
The temperature of the washing water should be in between 40°C and 45°C. Lower temperatures give less cleaning results and a higher chance of infecting eggs via the washing water. Higher temperatures may lead to embryonic death.
The water should be at least 10°C warmer than the egg temperature to prevent the egg-content from contracting and pulling water and microbes through the shell into the egg.

The water should not be more than 20°C warmer than the egg temperature to prevent thermal cracking of the egg.

4. Use correct washing time.
The washing time has nearly no influence on the quality of the eggs. A longer washing time may result in a better cleaning result and in reducing the microbes load at the eggshell. However, the washing time should be as short as possible but with a good cleaning result.

5. Use a correct detergent.
Detergents help to remove dirt and kill microbes during wet cleaning. Detergents generally raise water pH to 11. This alkaline environment helps to kill microbes. Most detergents that are used for dishwashers may also be suitable for washing eggs. However we advise you to use Mach-C egg cleaner. Recommended concentration is 0,5%, so add 5 ml egg cleaner to 1 litre water.
Check the concentration of detergent in your washing water regularly and add detergent if necessary.

6. Refresh washing water frequently
Using washing water for a longer time may result in cross contaminating the eggs and a higher chance of infecting eggs via the washing water. It is important to refresh the washing water after every 4 hours running production. Generally this is once a day.
Be conscious of where your wash water goes, as ongoing and excessive use of detergent could be harmful to your septic system.

7. Dry washed eggs.
It is important to quickly dry the eggs at a normal temperature (16°C) after washing and before packing and storing to prevent fungal and microbial growth. Eggs can be dried by evaporation, with fan assistance or by wiping.
When it is not possible to quickly dry the eggs, leave the washed eggs for one day in a dust free room at a normal temperature (16°C).

8. Clean your washing system thoroughly.
Dirt remaining in the washing system or in the washing water may contaminate the eggs that have to be cleaned the next day. Because of this it is of utmost importance to clean and disinfect the complete washing system at the end of a production day.

9. Keep floor eggs separated
Floor eggs are usually extremely dirty and may often have (hair) cracks. Although washed, keep these eggs separated from the nest eggs. When the hatchery is able to handle these eggs separated, this may prevents problems (like for example the consequences of exploders).

10. Do not wash eggs with poor shell quality.
Washing eggs of poor shell quality (flock age) is often more detrimental to hatchability than not washing at all.

11. Discard excessively dirty eggs.
Eggs are cleaned to remove debris and stains and reduce the microbial load. Excessively dirty eggs should not be cleaned, but rather discarded.

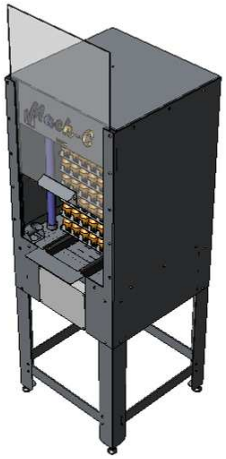
12. Consult your hatchery
Both you and your hatchery benefit from an optimum quality of the delivered eggs. Therefore it is necessary for the breeder to inform the hatchery about how the eggs are processed and for the hatchery to inform the breeder about the hatchability and chick quality of these eggs.

2 WASHING SYSTEMS

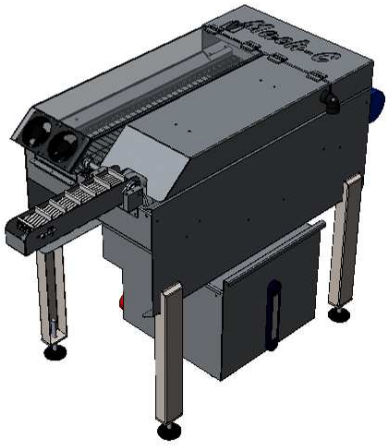
PRODUCT RANGE

Mach-C develops and constructs washing systems for the egg processing industry.

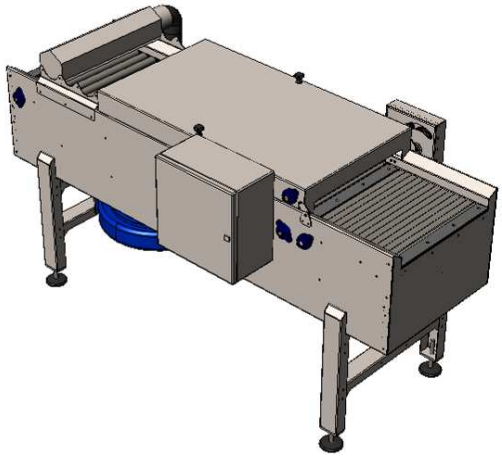
The following standard washing systems are available:
- Batch washer.
- Offline washer.
- Inline washer.



Batch washer



Offline washer



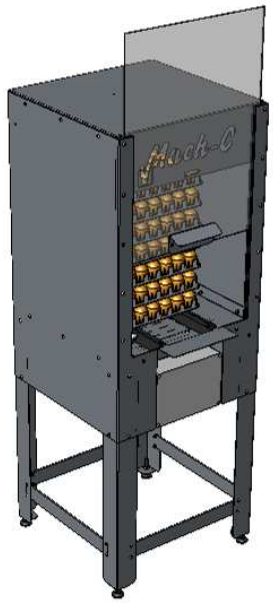
Inline washer

Batch washer:
The Batch washer is developed for smaller farmers, to clean a small number of eggs. The eggs are cleaned automatically, but have to be loaded manually on trays into the washer.

Offline washer:
The Offline washer is developed for larger farmers, to clean a larger number of eggs. Hand graded eggs from the egg collecting conveyor are placed on this washer that cleans and dries them. After cleaning they are automatically placed back on the egg collecting conveyor.

Inline washer:
The Inline washer is developed for larger farmers that want to clean all the eggs. This washer is placed in between the egg collecting conveyor and the packaging system. All eggs run through this washer and are automatically washed and dried.

BATCH WASHER



Features:
- Plug and play installation.
- Washes 252 eggs in 10-15 minutes.
- Adjustable water temperature.
- Adjustable washing time.
- Adjustable rinsing time.
- Quick water heating.
- Automatic soap dispenser.
- Low water consumption.
- Low power consumption.
- Build from stainless steel and other non corrosive materials.

Electrical data:

Connection voltage	:	230V 1 phase + N + PE 50Hz
Connection	:	3x1,5 mm²
Maximum voltage deviation	:	-/+ 10%
Pre-fuse	:	16 Amp, slow blowing
Ground-fault circuit interrupter	:	A minimum leakage current of 30 mAmp
Power	:	3 kW
Electrical protection	:	IP55

A ground-fault circuit interrupter in the main power supply is a necessity.

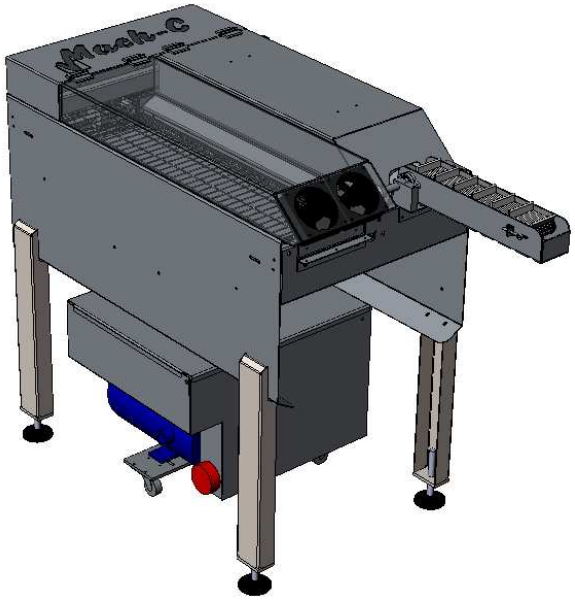
Water data:

Minimum water pressure	:	1 bars
Maximum water pressure	:	5 bars
Water consumption	:	± 10 Liters/batch
Water inlet hose connection	:	14 mm
Water drain hose	:	20 mm

Environmental factors:

Weight	:	± 60 kg
Dimensions	:	625 (l) x 550 (w) x 1515 (h) mm.
Product infeed height	:	830 mm typical
Sound level	:	<80 dB

OFFLINE WASHER



Features:

- Washes a maximum of 4.500 eggs per hour.
- Sensitive egg treatment.
- Adjustable water temperature.
- Adjustable washing time.
- Adjustable brush speed.
- Mobile water tank, easy to clean.
- Low water consumption.
- Low power consumption.
- Build from stainless steel and other non corrosive materials.

Electrical data:

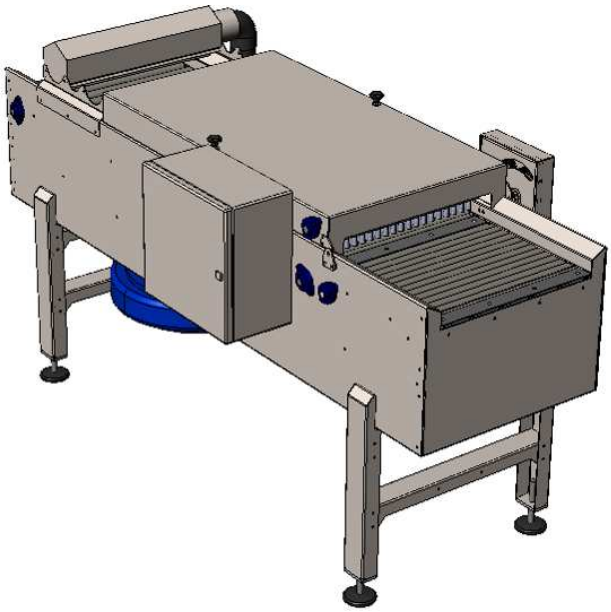
Connection voltage	:	400V 3 phase + N + PE 50Hz
Alternative voltage	:	230V 3 phase + PE 50 Hz
Connection	:	5x4 mm²
Alternative connection	:	4x4 mm²
Maximum voltage deviation	:	-/+ 10%
Pre-fuse	:	25 Amp, slow blowing
Ground-fault circuit interrupter	:	A minimum leakage current of 30 mAmp
Power	:	6,5 kW
Electrical protection	:	IP55

A ground-fault circuit interrupter in the main power supply is a necessity.

Environmental factors:

Weight	:	± 150 kg
Dimensions	:	1250 (l) x 850 (w) x 1100 (h) mm.
Product transport height	:	900 mm typical
Sound level	:	<80 dB

INLINE WASHER



Features:

- Washes a maximum of 20.000 eggs per hour.
- Sensitive egg treatment.
- Adjustable water temperature.
- Adjustable washing time.
- Adjustable egg transport speed.
- Mobile water tank, easy to clean.
- Low water consumption.
- Low power consumption.
- Touchpanel with multiple languages
- Build from stainless steel and other non corrosive materials.

Electrical data:

Connection voltage	:	400V 3 phase + N + PE 50Hz
Alternative voltage	:	230V 3 phase + PE 50 Hz
Connection	:	5x4 mm²
Alternative connection	:	4x4 mm²
Maximum voltage deviation	:	-/+ 10%
Pre-fuse	:	25 Amp, slow blowing
Ground-fault circuit interrupter	:	A minimum leakage current of 30 mAmp
Power	:	7,7 kW
Electrical protection	:	IP55

A ground-fault circuit interrupter in the main power supply is a necessity.

Environmental factors:

Weight	:	± 250 kg
Dimensions	:	2000 (l) x 1000 (w) x 1100 (h) mm.
Product transport height	:	900 mm typical
Belt width	:	600 mm
Sound level	:	<80 dB

3 REFERENCES

REFERENCES

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