

*Using the **™AktivPULS** successfully*

A) Requirements

1. Milking machine installation according to the current standard: ISO 5707/6690

2. Guide values: pulsation

Proper pulsation according to ISO 5707, additionally:

- a. Recommended pulse rate: 60 pulsation cycles per minute \pm 3 cycles
- b. Suction phase a+b : 63% \pm 3 %
- c. B-phase: 450 - 550 milliseconds
- d. D-phases: 220 – 300 milliseconds

3. Proper maintenance and service condition of the whole milking installation

- a. Perfect sanitary conditions, especially of all milk carrying components
- b. Perfect sanitary and functional condition of all seals
- c. Replacement of all wearing parts in the intervals recommended by the manufacturer.
- d. Exclusive use of cleaning agents, approved according to AktivPULS specifications.

Main wash temperature: minimum of 50 ° C for at least 10 minutes.

4. Unobstructed milk flow between claw and milk line

- a. Inside diameter of the long milk tubes \geq 16 mm
- b. No cross-section reduction in the long milk tubes
- c. Length of the milk tubes \leq 2,30 m, Swing over max. 3,60 m
- d. Direct guidance of the milk tubes, especially without sharp redirections ($> 45^\circ$) and/or „tube sacks“

Milk flow indicators, milk meters and shut-off valves without cross-section restrictions (inside diameter \geq 16 mm), redirections $> 45^\circ$, flattening's and/or changes of the shape (i.e. from round to angular)

5. Balanced position of the cluster due to good guidance of the milk tubes

- a. Tube support arms and/or automatic stripping devices (flat herring bone parlours and tandem parlours as well as and inward facing rotaries)
- b. Tube-forks and/or rope loops with counterweights (parallel milking parlours, outward facing rotaries)

6. Stress free milking conditions

- a. Sufficient room for the cows in the milking parlour
- b. Sufficient and uniform lighting of the milking pit, the walkways and of all standing areas
- c. Low noise levels for normal human perception
- d. Occurrence of flies and mosquitoes as low as possible

B) Use

1. Preparatory measures

- a. Recording the general conditions and complying with the technical basic functions of the milking installation (see prerequisites) and complete elimination of all detected defects
- b. Evaluation of teats (length, diameter, ringing at the teat end, hardening of teat ends, hyperkeratosis): The sample size should conform to general principles of scientific tests in order to obtain a representative picture of the herd
- c. Selection of the correct size of the Silicon Pro (XL, L, M, S) liner depending on the prevalent teat structure of the herd. For cows that are generally hard milking and for udders that can be milked more efficiently with a heavier cluster, it is possible to attach (even afterwards) additional teat cup weights.

2. Initial operation

- a. Installation of the clusters
- b. Function and leak test of the AktivPuls clusters at jettercups during cleaning.
- c. Testing of adherence, milking speed, and milk-out level during the first 1-2 milking processes
- d. Correction, if necessary (i.e. raising or lowering of cluster weight, adjusting liner sizes)

3. Monthly controls

- a. Milking speed
- b. Milk-out level for representative samples (milk ejection based on collapse of the udder after teatcup removal + stripping yields)
- c. Teat condition
- d. Body condition, milk yield, milk contents
- e. Maintenance and sanitary condition of the clusters and the rest of the milking installation
- f. Cell count and mastitis rate (as a basis for long term evaluations!)

4. Quarterly controls

- a. Every 3 months: as above + wear and tear on liners and pulsation parameter
- b. Every 6 months: as above + working vacuum and reserve air in accordance with ISO 6690

C) Criteria for success

1. Animal behavior: generally relaxed, cluster kick off < 10 %
2. Elasticity of teat ends: < 10 % clearly noticeable hardening
3. Teat condition: decrease of minor, moderate, and severe hyperkeratosis by one level ¹⁾ each in approx. 50 % over 12 weeks, further decrease by one level each in an additional approx. 25 % during the following 12 weeks
4. Stripping yields: average: ≤ 0.5 kg, percentage of cows > 0.5 kg < 50 %

The above parameters should only be used if all instructions for use are observed.

¹⁾level 1 - 3 on the following scale: 1 = minor (small callus ring), 2 = moderate (raised callus ring), 3 = severe (raised, chapped callus ring), 4 = very severe (raised, chapped callus ring with fronds)

D) General conditions

The special clusters AktivPULS have a proven positive effect on teat condition and milk out level (milk ejection and stripping yields) as long as technical operating conditions and a professional milking routine are observed. Both are essential prerequisites for long term good udder health and for achieving the highest possible milk yield. In order to achieve the optimal benefit the following conditions have to be observed.

1. Housing conditions and hygiene:

- a. Dry, clean lying areas and walkways in all sheds (also in the sheds for calves, heifers, dry cows and parturient cows): At least solid floor walkways (without slats) should be cleaned automatically at least every 2 hours.
- b. Hygienically safe litter, above all dry and free of microbiological pollution (i.e. fungal spores) and contaminants (i.e. tannins): It is recommended to use among other things wheat and barley straw of good quality as well as natural lime and wood shavings. Rye and Triticale straw are not recommended (because of frequent fungi infection) as well as wood shavings of certain trees (such as beech trees and oak trees)
- c. Well placed water troughs in the shed, adequately dimensioned (with a width of at least 8 cm per cow)
- d. Sufficient space and lighting, as well as good air (without drafts) based on the principles of animal welfare and cow comfort.

2. Feeding:

- a. Tasty forage and concentrate of perfect quality, as well as drinking water fit for human consumption, especially free of dirt, deposits and pollutants (such as mildew or alcohols)
- b. Appropriate nutrition (especially with energy, protein, crude fibre and minerals), assessable among other things through milk yield, milk content, body condition and dung consistency.

3. Correct milking routine:

- a. Pre-stripping of all teats (at least 3 squirts from each teat) including a check for visible changes in the milk and taking of appropriate measures (such as separating visibly changed milk and extensive examination as well as any treatment of animals with visibly changed milk)
- b. Cleaning of all teats before attaching the teat cups with separate cloths for each animal. The cloths should be hygienically perfect, slightly moist and absorbent (i.e. fleece cloths that were previously machine washed at high temperature or absorbent one way cloths).
- c. Drying of wet teats, so that the teats are at most slightly moist
- d. At least 10 seconds of uninterrupted udder preparation (pre-stripping and teat cleaning, one directly after the other)
- e. Attaching the teat cups 40 - 60 seconds after udder preparation or (in the case of time-controlled machine stimulation) immediately after udder preparation
- f. Avoidance of slippage while attaching the teat cups (< 10 %)
- g. Careful adjustment of the cluster, so that the teat cups hang straight (the teat cups should form a 90°-angle with the base of the udder)
- h. Realistic milking management with sufficient milking time per cow, so that the desired milk yield and a good milk-out rate can be achieved. Normal throughput capacities for group milking parlours are 4-5 cows per milking station per hour, depending on the size and type of the milking parlour. Only with tandem parlours higher rates of 7-8 cows per milking station/per hour can be achieved.
- i. Timely milk-out control (immediately before or at cessation of milk flow) to avoid any appreciable overmilking (> 20 seconds).
- j. Stripping as required, especially for hard milking cows with high stripping yields in spite of optimal milking technique and correct milking routine (> 0.5 kg) or for cows with acutely elevated cell counts or clinical mastitis.
- k. Immediate removal of teat cups after final cessation of milk flow
- l. Treatment of teats (dipping or spraying) primarily with care products:
- m. Under no circumstances products should be used that stress or dry the skin, such as products containing iodine, those of low quality and those lacking moisturising substances (i.e. grease).