DANISH MEAT
RESEARCH INSTITUTE

Steam Vac Tubular-5

21.12.2017

NTM/and others

User and installation guide

Steam Vac Tubular-5, a new steam vacuum suction tool for improved slaughter hygiene on beef, sheep and pork.

- Removes hair, faecal and soiled carcass spots
- Easy, ergonomic and hygienic to use
- Cleans large area
- Reduction of bacteria
- Improved microbial and visual quality

Technical data

- Suction nozzles — Silicone
  - Total suction width — 95 mm
- Handle — Poly-amide, PA - thermoplast
- Clip — Stainless steel
  - Vacuum connection — Ø 32mm
  - Steam connection — Ø 10 mm
- Total weight — 534 gram
- Patent WO2009/138083A1

Installation advice and dimensioning

DMRI has prepared general guidelines for the use of Steam Vac Tubular-5 and connections to steam and vacuum. If further assistance is required concerning specific facility solutions, DMRI offers consultancy within specifications, dimensioning, connections to steam and vacuum supply, commissioning, approvals, training and control according to individual customer demands.

Contents

- User manual
  - Replacement of steam suction nozzles
  - Cleaning procedures
  - Guidelines for installation
    - Connection and installing of tool
    - General guidelines for setup of vacuum and steam supply
      - Principal diagram for connecting the tool to steam and vacuum supply
- How to adjust the steam and vacuum supply to a standard user setting
- EC Declaration of a partly completed machinery and safety evaluation
- Declaration of compliance EC 1935/2004 - Material into contact with food

User manual

The Steam Vac Tubular-5 tool is developed for steam vacuum suction of warm carcasses. It is especially well suited for removal of contaminations as an alternative to removal by knife and hands.

After connection and correct setting of steam and vacuum, the tool is used on the contaminated areas to be treated. The tool is moved repeatedly over the contamination until it is removed.

A short term reversible product discolouration is normal. Prolonged suction of an area may lead to irreversible product discolouration. By normal use, discolouration will rarely occur after chilling of the product.

The Steam Vac Tubular-5 tool is not well suited for large material removal of for example fat and other tissue. In such cases, the DMRI Classic model with a larger suction opening is recommended.

If the suction nozzles are blocked by fat or tissue they can be cleaned by air pressure with a pneumatic pistol.

The suction nozzles will wear down over time, depending on the use, and they should then be replaced for optimal operation.

Over time, the suction nozzles will absorb moisture to an extent that reduces the steam flow, thereby reducing the treatment efficiency. In such case, the nozzles are easily replaced by a new set of nozzles. After cleaning, the used nozzles can be placed in a dry environment, and the absorbed moisture will disappear within a week. Then the nozzles can be reused provided they are not worn down.

Replacement of steam suction nozzles

If nozzles are to be replaced because of blocking or tear, they are replaced with an original set of nozzles.

1. After turning off the steam and vacuum supply, the tool is disconnected by removing the bracket split
2. Use a Torx key to remove the five bolts in the bracket on the tool suction head
3. Remove the bracket carefully with your hands, without using tools as the bracket wall is quite thin
4. Take out the nozzles from the bracket without tools
5. The bracket and handle is cleaned before inserting new nozzles
6. Insert nozzles orientated correctly in the oval bracket openings
7. Make sure all nozzles are orientated and then mount the bracket carefully on the tool head, without using tools. Make sure the bracket is placed correctly before fastening the bolts
8. Fasten bolts gently with a Torx key
9. Connect the tool to the clip and secure the connection by inserting the split
10. You can now start working again

Cleaning procedures

Cleaning during processing

The steam and vacuum supply to the silicone nozzles touching the product keeps them continually sanitized. The sides of the nozzles where they are mounted, the bracket, and the handle may need periodically cleaning, depending on use. They can be cleaned with lukewarm water (approx. 42 °C) during breaks. At the same time, a check for free passage in all nozzles should be made as well as for tear on the nozzles. If the channels are blocked, they can be cleaned with a pneumatic pistol. If the nozzles are worn, they must be replaced.

Cleaning after processing

Every day after processing, the handle should be cleaned as described below.

1. Disconnect the handle by the bracket split
2. Use lukewarm water (approx. 42 °C) for cleaning inside and outside. The inside is cleaned by flushing the handle as well as the nozzles
3. Separate the handle, bracket and nozzles by following the instructions for nozzle replacement
4. Check for free passage in the steam channels and for wear on nozzles. If steam channels are blocked, they should be cleaned by a pneumatic pistol. Worn down nozzles must be replaced
5. Handle, bracket and nozzles are placed upright in a dish washer and washed using a standard program at approx. 60 - 70°C. Standard programs should include pre-rinsing, soap wash and after-rinsing. The washing temperature depends on the soap used, being either an alkali or acid based soap. The amount of soap to be used is described in the soap product sheet
6. Handle, bracket and nozzles are dried at room temperature
7. Assemble the tool. Follow the instructions for nozzle replacement. Make sure nozzles are placed correctly in the oval holes in the tool head, and the bracket is positioned correctly
8. Connect the handle to steam and vacuum by the bracket split

In case of dried up contaminations on the handle; soak handle, bracket and nozzles in soap water. Use a 0.5 - 1% soap concentration or as prescribed in the product sheet for the soap product. Duration of soaking depends on the degree of contamination. After soaking, place all parts in the dishwasher as described above.

Note!! It is important to soak the equipment in a soap solution and <u>not</u> in a detergent, as the soap will dissolve the contamination!!!

Guidelines for installation

The Steam Vac Tubular-5 tool is to be connected to the purchasing parties' own existing or for the purpose newly installed supplies of steam and vacuum. As use and set up of the system will vary between different slaughter lines, only general recommendations are given for the installation.

DMRI offers further consultancy within specifications, dimensioning, connections to steam and vacuum supply, commissioning, approvals, training and control according to individual customer demands.

Connection and installing of the tool

Steam supplied to the Steam Vac Tubular-5 tool must be of a quality suited for direct contact with food.

The steam and vacuum hose must be tightened securely onto the stainless steel clips with hose clips, and connected to the handle with the split prior to opening the supply of steam and vacuum.

Hoses should be mounted and hung in such a way that they do not touch the treated object during steam vacuuming regardless of the tool being used or at rest. Furthermore, the hose should be mounted in a manner that allows free movement for the operator performing other tasks.

A fork may be useful for leaving the tool when at rest, see the picture. The fork should be placed in a way that prevents the steam fan from reaching products, the operator, or other bypassing operators in the area. An example of a fork is shown below.

General guidelines for setup of vacuum and steam supply

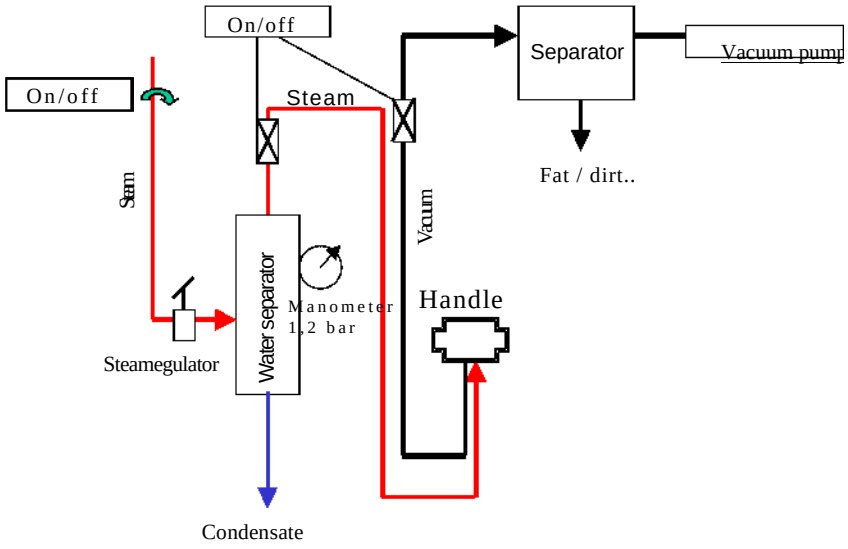
Depending on the setup, the number of Steam Vac tools used, distances and adjustment, the installations may vary in specification.

Based on tests with one tool, the consumption of steam is estimated to approx. 10 - 20 kg steam/water/hour/tool. In some plants, steam is already available. When using an electric steam generator, an energy consumption of approx. 7 - 10 kWh is expected. A vacuum pump system with separator providing 5 - 15 kPa is also needed and will require an additional energy consumption of approx. 4 - 6 kWh. Vacuum pump type and size will depend on demand and distance between pump and handle, for example a rotary lobe blower with a nominal motor rating of 0.75 to 11 KW. That size of pump is more than sufficient; and it can be placed far away from the handle and still maintain vacuum. Side channel blowers can be used, but care should be taken to avoid water pockets in the vacuum hoses.

In the attached diagram, the needed components for a full system are shown in a general design. DMRI offers further consultancy within dimensioning and specifies individual solutions according to individual customer demands.

Necessary general components are:

- Steam Vac Tubular-5 handle
- Vacuum pump and valve
- Separator tank (any sealed container, in which fat, dirt etc. can be separated from the airflow)
- Water separator
- Steam supply, valve and manometer



Principal diagram for connecting the tool to steam and vacuum supply

How to adjust the steam and vacuum supply to a standard user setting
Individual systems may need slightly different adjustments to become optimal. In the following, a general simple procedure is given to adjust to a standard setting with attractive results.

1. Turn off the vacuum, by closing the connection from the handle to the vacuum pump and water separator
2. Adjust the steam pressure to approx. 1.2 bar on the outlet from the water separator (and pressure regulator)
3. Open the connection (ball check valve) between the water separator and the steam vacuum handle - until there is a plume of steam “reaching” approx. 1 meter from the nozzles
4. Open the connection to the vacuum pump (ball check valve) until the plume of steam reaches ap-prox. 2 cm from the nozzles
5. Now try to operate the steam vacuum handle on the product to be treated

The method mentioned above is a basic setting. More vacuum can be needed. In that case, the amount of steam has to be increased as well.

EC Declaration of a partly completed machinery and safety evaluation

Steam Vac Tubular-5 is designed to become a part of a complete machine with connected steam and vacuum. As a partly completed machine it is declared to be constructed according to announcement No. 621 of 25 June 2008 that implements Directive 2006/42/EC.

Risk evaluation is conducted according to ISO 14121-1. The risk profile is acceptable with a low probability of scalding by the operator unintentionally directing the steam fan towards own body or other operators nearby. The above mentioned partly completed machinery may not be taken into use before the machine into which it is being built or to which purpose it must be used for conform to any relevant regulations.

Declaration of compliance EC 1935/2004 - Material into contact with food

Materials used for manufacturing the Steam Vac Tubular-5 are intended to come into contact with food in compliance with regulations No. 1935/2004 EC.

Contact: DMRI@teknologisk.dk +45 7220 2000