

Frying Line for Bacon Diced and Sliced

Detailed Description of the subject matter of
the order

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Contents

1	Introduction.....	4
1.1	Purpose.....	4
1.2	Scope of supply.....	4
1.3	Supplier responsibility.....	4
1.4	Supplier and sub-supplier.....	5
1.5	Design.....	5
1.6	Other design criteria.....	5
2	Factory layout.....	6
3	Products Input / Infeed to the frying machines	7
3.1	General Product Description	7
3.2	General infeed product temperature.....	7
3.3	Diced Bacon.....	7
3.4	Sliced Bacon.....	8
4	Planned Way of product infeed to the frying line	10
4.1	General overview	10
4.2	Way of diced bacon infeed.....	10
4.3	Way of sliced bacon infeed	11
4.3.1	Slices orientation.....	12
5	Expected Products Output / Outfeed from the Frying Line	13
5.1	Fried Level - expected.....	13
5.2	Appearance off fried bacon – expected.....	13
5.2.1	Fried Diced bacon.....	13
5.2.2	Fried Sliced Bacon.....	14
5.3	Final product temperature - expected	14
5.4	Other expectation	14
6	Capacity / Productivity.....	16
6.1	General Description.....	16
6.1.1	Diced Bacon.....	16
6.1.2	Sliced Bacon.....	16
6.2	Guaranteed Capacity.....	17
6.2.1	Sliced bacon Capacity	17
7	Heating Source.....	18
7.1	General requirement.....	18
8	Cooling / Chilling.....	19
8.1	General requirements	19
8.2	Type of product	19
8.3	The temperature of the product at the inlet to the cooling machine.	19
8.4	Product temperature out	19

8.5	Capacity	19
8.6	Refrigerant.....	19
9	Other specific requirements	20
9.1	Ventilation / Exhaust System	20
9.2	Software to maintain Recipes	20
9.3	Product development support	20
9.4	Communication Protocol.....	20
9.5	Software	20
10	Operational requirements	21
10.1	OEE	21
10.2	Operating hours.....	21
10.3	Availability time	21
10.4	Cleaning	21
10.5	Instruction for cleaning	21
10.6	Maintenance.....	21
10.7	Special Technical requirements.....	21
11	General Requirements	23
11.1	Quality and food Safety Standards.....	23
11.2	Electrical and component Standards.....	23
11.3	Safety requirements for food product machinery	23
12	Documentation.....	24
13	FAT & SAT.....	25
13.1	FAT.....	25
13.2	SAT.....	25
1.1	Glossary	25

1 Introduction

1.1 Purpose

The purpose of this specification is to define the delivery conditions of **Frying Line that includes Automatic frying machine with grease recovery and 1 pc. Chiller – industrial cooler** including functionality requirements, operational requirements and technical requirements, installation and training for company HKScan Poland in Świnoujście, further guarantee conditions, service conditions and maintenance support during the life of the line.

1.2 Scope of supply

Supplier will be required to:

- Provide and launch Automatic frying machine for bacon with grease recovery, that includes:
 - Infeed belt for diced bacon and sliced bacon, including integration (mechanical, electrical and interface) with 3rd party equipment indicated by HKScan that will supply machines for sliced and diced bacon infeed.
 - Frying/cooking machine including microwave and gas heating system(s)
 - Pumps and tanks needed for regular operations as well for cleaning and maintenance of the machine
 - Fat Separation equipment to separate fat form the product after frying/cooking
- Provide and launch bacon Chiller – industrial Cooler:
 - Cooling/Chilling machine
- Be responsible for integration between Frying/Cooking and Cooling/Chilling
 - Mechanical Integration
 - Electrical integration
 - Interface signal integration
- Provide Control Systems
- Conduct training for operators and technical staff as well cleaning team and management
- Preparation of technical documentation in Polish and English Language, Including CE
- Provide equipment approved and marked in accordance with the CE
- Provide ventilation system for cooking/frying machine
- To cooperate with HKScan in terms of agreeing on how to get the machines into the factory

HKScan will indicate 3rd party suppliers of downstream and upstream machines, but supplier shall cooperate with indicated provider in scope of delivery, integration and training.

1.3 Supplier responsibility

The Supplier is responsible for delivering a complete, integrated, operational and functional system which is introduced in more detail in this Appendix.

The Supplier bears all responsibilities of the delivery. Any acceptance made by the Purchaser or the authorities during the delivery do not decrease this responsibility of the Supplier or part of it. The Purchaser reserves the right to perform its own tests connected with the manufacture and receiving inspections at the Supplier's or at his sub-supplier's premises. Inspections made by the Purchaser shall justify rejecting of partial or whole delivery, if the machine will not meet requirements described in this document.

The Supplier is responsible for ensuring that requirements of all the applicable EC directives and regulations and national laws related to components, materials, machinery and equipment within the

Scope of Supply are fulfilled, for instance in relation to conformity assessment, declaration of conformity and CE marking.

Responsibilities of the Parties at Site are determined PDF Responsibilities of the Parties at Site – Appendix 8. The Supplier shall act as manufacturer during the installation and carry out the conformity assessment and issue the declaration of the conformity (for instance for Assemblies of machinery). The Supplier shall also affix the CE marking when it is required by any EC directive, EC regulation or national law and provide the Purchaser with sufficient information of risk analysis.

1.4 Supplier and sub-supplier

Supplier and sub-suppliers shall have a valid and certified management system, for instance in accordance with EN ISO 9001, EN ISO 14001 and EN ISO 22000. List of approved sub-suppliers is part of this agreement. All other sub-suppliers shall be approved by the Purchaser. The Purchaser shall have right to visit the manufacturing sites of the Supplier or his sub-suppliers to verify and monitor the conformity of the contract requirements, component design, manufacturing and witness tests and inspections related to the Equipment. During such a visit the Purchaser shall have right to review all the documents, records and procedures related to the Scope of Supply.

1.5 Design

The design life time of the Equipment shall be at least 15 years. The Equipment shall be designed for continuous operation. Equipment shall be designed to fit in without any modifications to the existing equipment that are outside the Scope of Supply at Site.

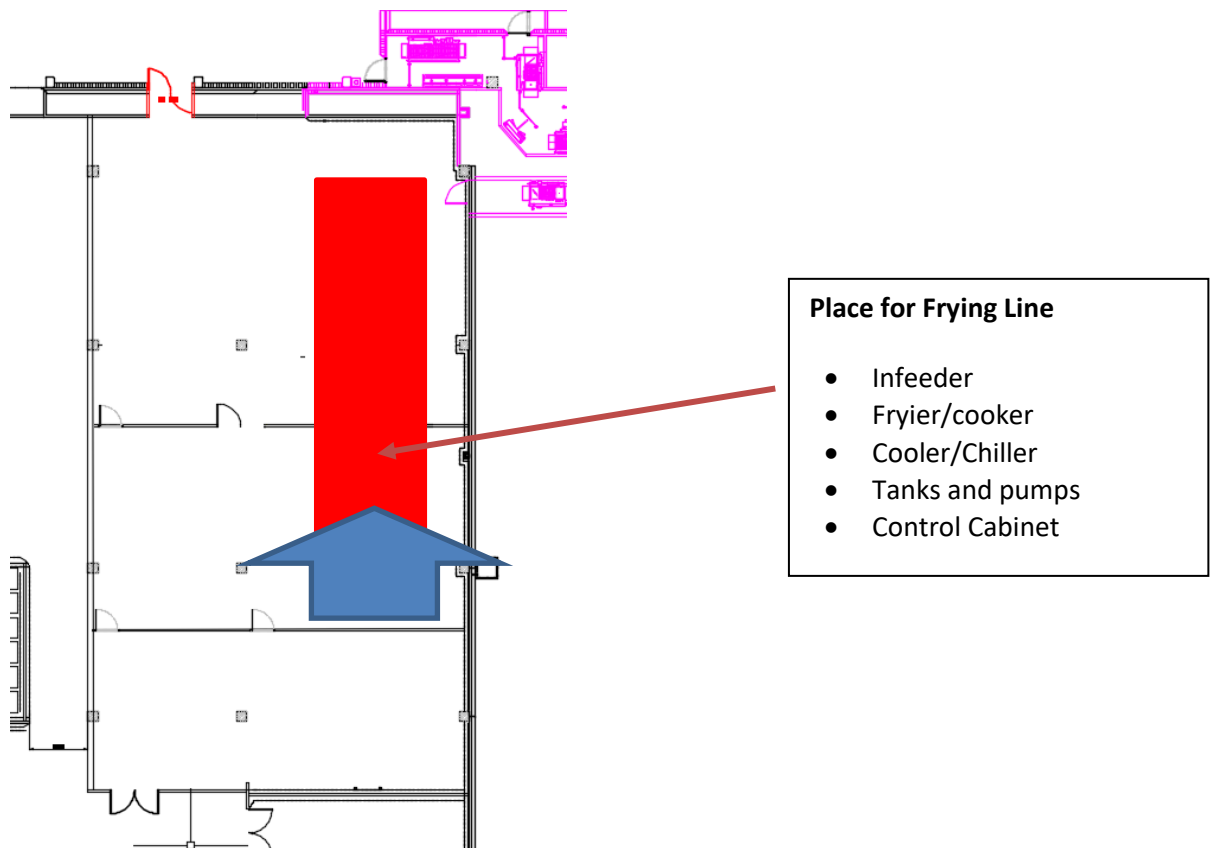
1.6 Other design criteria

The Equipment shall be design for withstand maximum occurring forces and stresses during all normal, emergency and fault situations that may occur during the operation of the Equipment. The Equipment shall be designed so that the thorough cleaning of the surfaces in contact with the food product is assured. It should not take longer than half an hour to make thorough cleaning of the Equipment including possible disassembling and reassembling of the parts. The material selection shall be made so that they are suitable for both operating conditions and withstand the daily cleaning with cleaning detergents recommended by the Supplier, without corrosion, fading or any other kind of material damage. Traceability of the materials shall be ensured. Metallic products shall be delivered according to EN 10204.

2 Factory layout

As an attachment to this appendix there is factory layout, including rooms where Frying/Cooking line will be installed – “HKScan Layout For Frying”. However – as part of the area where equipment will be placed will be under re-building – there is possibility adapt new rooms design to the designed machine. **The height from the floor to the middle roof is 4m and this will not change – this is the available height for machines including facilities connection.** There is available space between middle roof and final roof which will be used for pipes conducting . Supplier shall provide complete layout drawings in dwg-format. Machine shall be place inside the production plant.

- **Together with Quotation** – General drawing of machines with general dimensions, indicated facilities connection
- **Documents of Package 1** – Detailed drawings of all machines including detailed info about facilities connection - 30 days after contract sing



3 Products Input / Infeed to the frying machines

3.1 General Product Description

Semi-finished products which is going to be fried and chilled this is partly processed pork bacon without bones nor ribs. This bacon can be smoked or raw with different content of the fat (more fatty, more meaty). General semi-finished product structure is as follow:

Fat	Protein	Moisture	Collagen	Salt
20-30%	10-20%	40-65%	1,5– 2,5%	1,5-3%



3.2 General infeed product temperature

Temperature of the bacon infeed is $-8 \div -5$ C deg.



3.3 Diced Bacon

Frying line shall be able to run following types of diced bacon:

a. Lardong

Type	Dimension & Pictures	
	5 x 5x 20-40mm	7,5 x 7,5 x 20-40mm
Lardong		


b. Cubes

Type	Dimension & Pictures	
	10 x 10 x 10mm	5 x 5 x 5mm
Cubes		

c. Flakes

Type	Picture
Flakes	10-15 x 10-15 x2 mm
	

d. Curly Bacon

Type	Picture
Curly Bacon	50-150 mm x 15-25mm x 1.8 – 3.0 mm
	

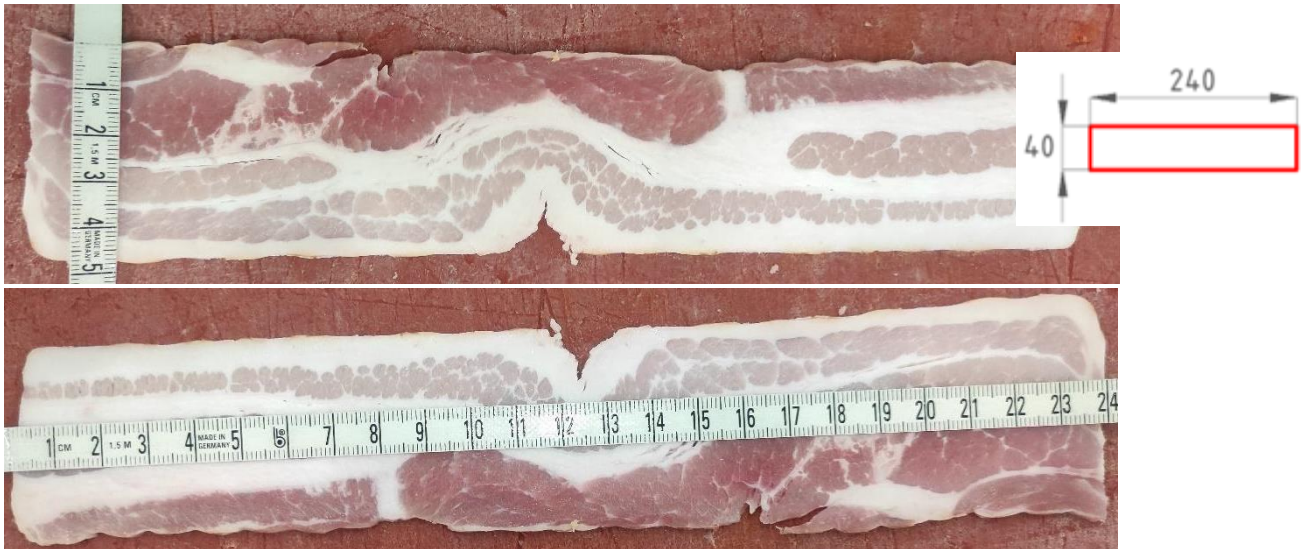
3.4 Sliced Bacon

Frying Line shall be able to run following types of sliced bacon

a. Cold smoked sliced bacon

Length [mm]	Width [mm]	Thickness [mm]	Weight [g]
240 (+/- 10)	40 +/- 10mm	1.7—3.0 mm	17 – 35 g

For the capacity calculation single slice thickness 2.3mm and weight 20g shall be taken



b. Raw sliced bacon (Steakfleask)

Length [mm]	Width [mm]	Thickness [mm]	Weight [g]
240 (+/- 10)	40 +/- 10mm	4.1 – 13 mm	34 – 60 g



4 Planned Way of product infeed to the frying line

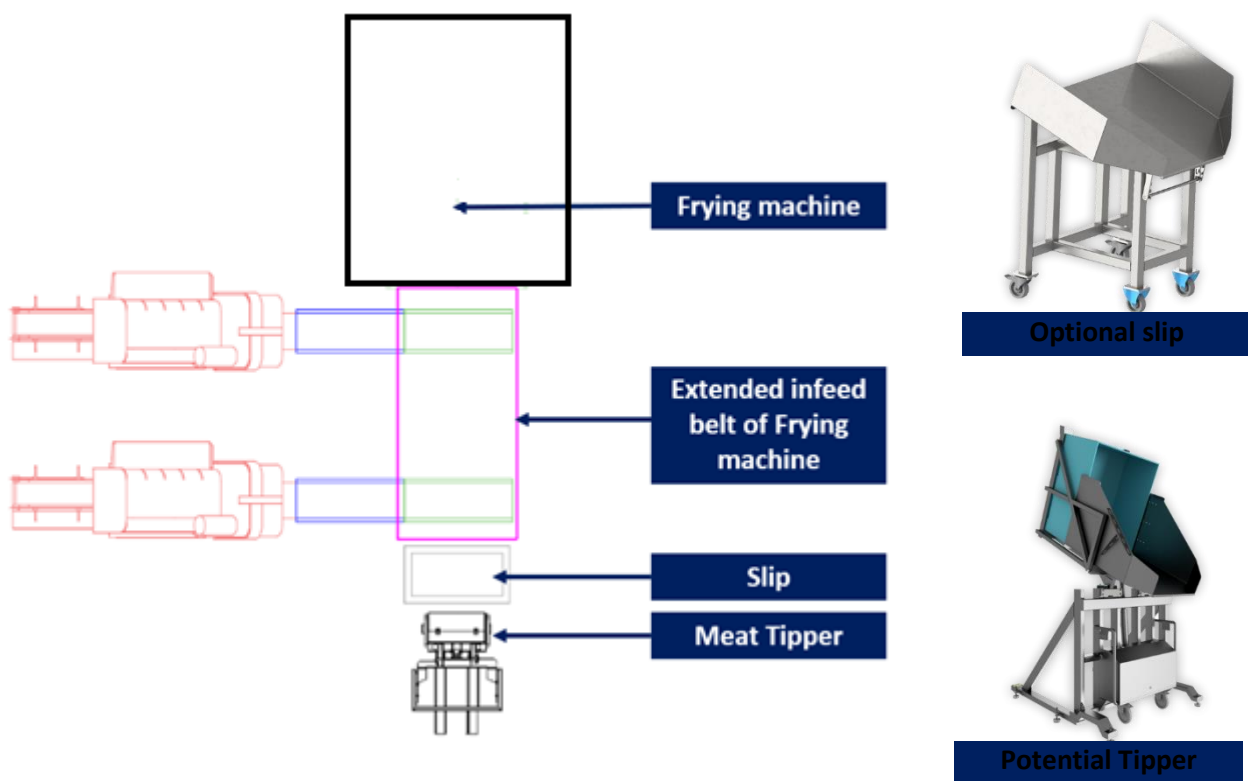
4.1 General overview

Presented way of product infeed to the frying line is just a concept prepared by HKScan. This concept which is not decided yet in the details and shall be developed together with 3rd party supplier and with supplier of the Frying line.

4.2 Way of diced bacon infeed

a. Option 1 – Directly to the infeed belt

Diced Bacon will be loaded from the Big-Box by movable Tipper with slip. Big-Box tipper is going to be standing in front of Frying machine's Infeed belt. Slip will be adapted to the width of the Frying Machine's Infeed belt. Height of the unloading will be adapted to the height of Frying machine's Infeed belt.



On the site of the infeed belt there will be operator (or 2 operators on both sites – depends on the belt width) who is going to take care about equal diced bacon surface on the infeed belt and will secure as much width utilization as possible.

The size of the net from which the infeed belt is made must be such as to reduce bacon waste caused by bacon getting stuck in the net.

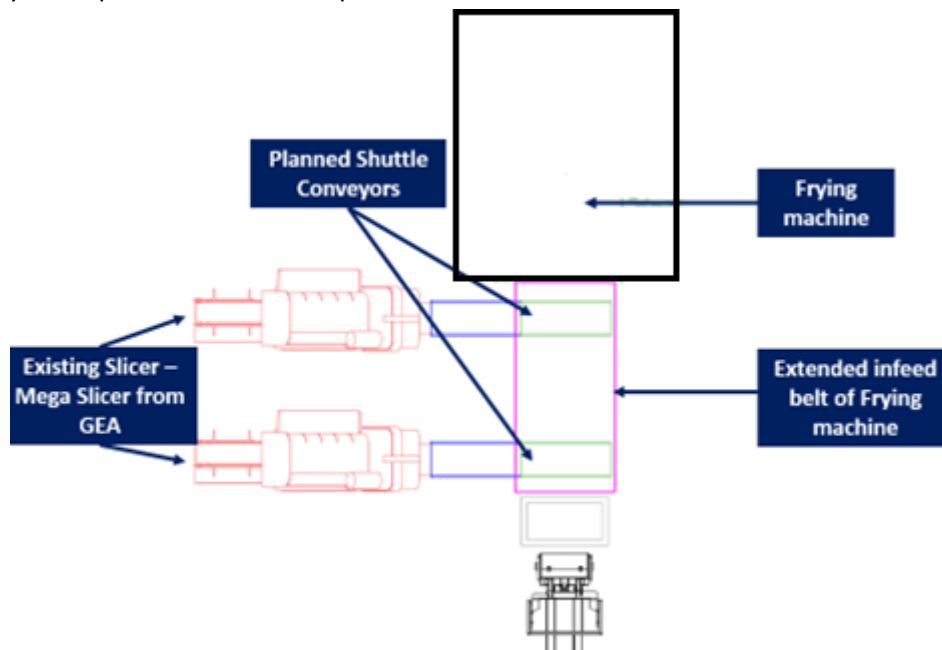
Bacon waste – small bacon pieces that stays on the net



4.3 Way of sliced bacon infeed

To secure continuous bacon slices infeed to the Frying Machine, HKScan Plan is going to use 2 Mega Slicers from GEA – Existing machines. To transfer bacon slices between slicers and Frying machine's Infeed belt there will be purchased new devices: Shuttle Conveyors. Once the proper number of slices is cutted and transfered to the shuttle conveyor it will be dropped directly to the infeed belt of frying machine. Once the proper number of slices is cutted and transfered to the shuttle conveyor it will be dropped directly to the infeed belt of frying machine.

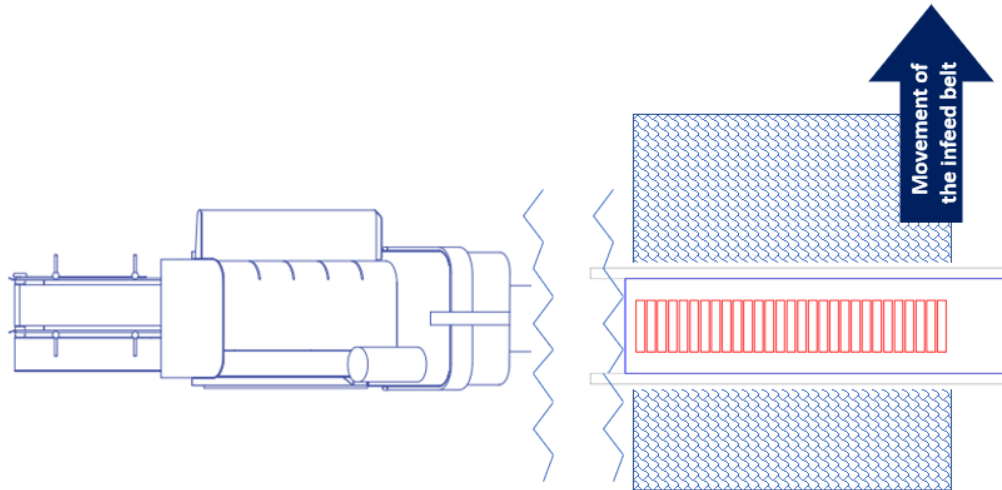
Preliminary concept is showed on the picture below.



4.3.1 Slices orientation

Slices are going to be provided to the shuttle conveyor then dropped on the infeed belt. Slices orientation on the infeed belt are the short side in the direction of the frying machine's infeed belt movement.

Preliminary concept is showed on the picture below.



5 Expected Products Output / Outfeed from the Frying Line

5.1 Fried Level - expected

Machine shall be able to produce final product with different level of fried.

kg in / kg out	Yield %	Fried Out	For SAT*
285 / 100	35%	65%	Yes
250 / 100	40%	60%	No
222 / 100	45%	55%	No
200 / 100	50%	50%	Yes
182 / 100	55%	45%	No
167 / 100	60%	40%	No
153 / 100	65%	35%	No

285 / 100 means that to get 100kg of final product 285kg of semi-finished product must be provided to the machine

5.2 Appearance off fried bacon – expected

5.2.1 Fried Diced bacon

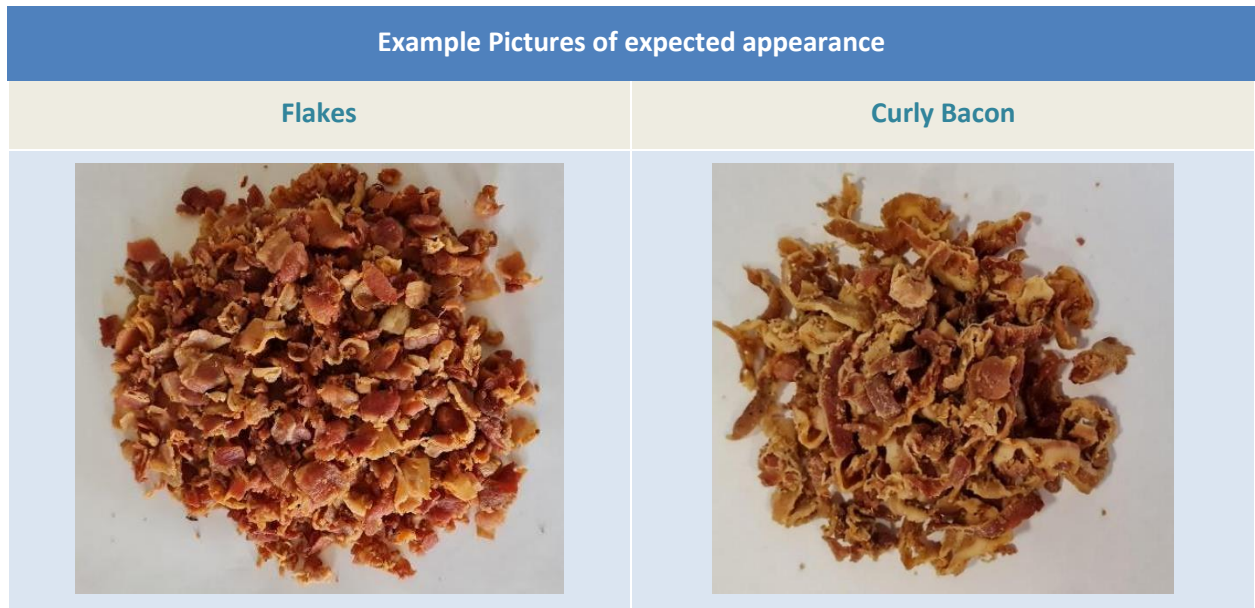
Example Pictures of expected appearance

Cubes



Lardong





5.2.2 Fried Sliced Bacon



5.3 Final product temperature - expected

For all products expected temperature after chilling is $-4 \div +8$ C. deg

5.4 Other expectation

- Burned edges are not allowed



Not allowed

- For yield 40% - 35% product shall be crispy
- Fat shall be removed from the product

6 Capacity / Productivity

6.1 General Description

6.1.1 Diced Bacon

- To prepare semi-finished product of Cubes / Lardong / Flakes HKScan is using 3D Dicer manufactured by Carruthers.

6.1.2 Sliced Bacon

- Basic info about the single bacon slice that will be used for capacity calculation

Prodcut info		
Factor	Value	Comments
Single slice dimesnions	24 x 4 cm	According to he bacon from Chopin forms
Slice Thisnckess	2,3 mm	
Single slice weight	20 g	

- Slices will be provided by 2 Mega Slicers from GEA with the total capacity 650 kg/h. (single slicer capacity is 325kg/h)
- Based on the planned way of sliced bacon loading, estimated number of slices on a surface 1m x 1,5m will be 116 pcs.
- Planned distance between slices is 10mm



6.2 Guaranteed Capacity

- Based on the data in point 4 and 5.1 the Supplier guarantees capacity according to the below table
- The expected capacity applies to the entire technological line - Cooker and Chiller
- In case that the Purchaser is unable to supply the machine with the quantity as per the above-stated 'Input Capacity,' the capacity will be recalculated based on the actually delivered quantity of the product.

Input to the machine to be secured by Purchaser						Expected Output from the machine	
Product Type	Length	Width	Thickness	Raw Product Weight	Input Capacity	Process Yield	Output Capacity
Bits	According to point 2.3				2000 kg/h	35%	700 kg/h
Bits					2000 kg/h	50%	1000 kg/h
Bits					2000 kg/h	60%	1200 kg/h

Frying capacity will be validated during SAT Test. Frying Capacity shall be observed regardless diced bacon type – cubes, lardong, flakes

6.2.1 Sliced bacon Capacity

- Based on the data in point 4 and 5.2 the Supplier guarantees capacity according to the below table
- The expected capacity applies to the entire technological line - Cooker and Chiller
- In case that the Purchaser is unable to supply the machine with the quantity as per the above-stated 'Input Capacity,' the capacity will be recalculated based on the actually delivered quantity of the product.

Input to the machine to be secured by Purchaser						Expected Output from the machine	
Product Type	Length	Width	Thickness	Raw Product Weight	Input Capacity	Process Yield	Output Capacity
Slices	240 mm	40 mm	2,3mm	20g	364 kg/h	35%	127 kg/h
Slices	240 mm	40 mm	2,3mm	20g	537 kg/h	50%	269 kg/h
Slices	240 mm	40 mm	2,3mm	20g	650 kg/h	60%	389 kg/h

Frying capacity will be validated during SAT Test.

7 Heating Source

7.1 General requirement

Heating Source for Cooker must be Microwave and Direct Gas

- Microwave is needed to secure quicker heating of thicker bacon slices what will be needed to increase machine capacity
- Direct gas is needed to secure lower COGS related to the lower energy costs (in comparison with electrical heating)

8 Cooling / Chilling

8.1 General requirements

Cooling / Chilling machine shall be integrated part of the total solution provided by supplier.

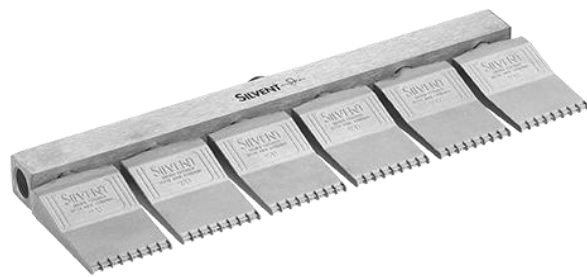
8.2 Type of product

Cooling machine shall be able to work with all types of product – the same as for frying machine – Diced bacon (lardong, cubes, flakes) and Sliced bacon, with consideration it is fried bacon.

8.3 The temperature of the product at the inlet to the cooling machine.

Just after frying machine and before Inlet to cooling machine products shall be cooled down by the set of air knives. **The target is to cool it as much as possible before inlet to the cooling machine**, so the energy needed to cool down the product in Cooling machine will be as less as possible.

Examples of air knife are presented on the picture below.



8.4 Product temperature out

Required product temperature at the outlets from Cooling machine shall be at level: **-4 ÷ +8 C deg.**

8.5 Capacity

Capacity shall match capacity of Frying machine

8.6 Refrigerant

The Cooler should be based on one of the following refrigerant:

- R744
- R449A
- R452A

Supplier shall provide detailed information related to capacity of required refrigeration.

9 Other specific requirements

9.1 Ventilation / Exhaust System

Supplier shall deliver Exhaust System - Complete with high-temperature insulated ductwork and stainless-steel air stream side inlet fan

9.2 Software to maintain Recipes

Machine shall be able to Store minimum 20 different recipes related with the different product and different fried ration.

Recipes editing and saving must be protected by the password. Operator can select recipe to work with, has a right to adjust it for current production, but so not have right to save.

9.3 Product development support

- a. Within Machine Commissioning supplier is responsible to setup – in cooperation with HKScan – 10 different recipes with different frying ratio and different type of product
- b. Within 24 month after approved SAT supplier will be responsible to visit HKScan site 2 times per year to adjust recipes, develop new product, improve machine utilization in relation to the best quality product and optimum energy usage.

9.4 Communication Protocol

Machines shall be equipped with:

- Ethernet Switch
- Ethernet/IP and Profinet communications protocol to allow to connect machines to other HKScan's IT systems and Machines for further integration in scope of M2M communication

9.5 Software

Machines shall include software (related to the PLC or HMI) that will allow to control

- Historical machine and production parameters
- Actual machine and production parameters

Software shall be able to provide reports related to the production and technical conditions of the machine. Software and hardware shall allow to work with machine on-line and by remote access.

Software allow to work with recipes according to the point 9.2. The device will be equipped with a software alerting about errors, failures and needs maintenance.

10 Operational requirements

10.1 OEE

Frying line lines must running such a way to ensure OEE at level 85%. OEE must be and will be measured according to the HKScan OEE Measurement procedure – Appendix “HKScan OEE Measurement procedure”. **Availability – as a part of OEE – is required at level not lower than 98%**

10.2 Operating hours

Frying Line will be running

- During 1st year of operation: 5 days in a week, 2 shifts per day, 7,5h per shift.
- During 2nd year and later of operation: 5 days in a week, 3 shifts per day, 7,5 h per shift.

10.3 Availability time

Availability – as a part of OEE – is required at level not lower than 98%. Moreover HKScan requirement is to have separated service contract, where:

- The supplier will secure On-line support
- The supplier shall deliver the Critical Spare Parts to the Site within 48 hours from the Purchaser’s request.
- Service must be provided in Polish or English language
- All spare parts must be available for 10 years

10.4 Cleaning

Machines must be built in such a way to allow easy line cleaning by water and chemistry, according to the cleaning instruction. All electrical and pneumatic parts must be protected against water. The parts that need to be disassembled for each washing must be easily accessible. **General cleaning of the machine will be performed every 9 shifts (72h)**. The total cleaning time should not exceed 6 hours, which is the time from the last piece of bacon leaving the line to the first piece of bacon entering the line. Cleaning possible with existing chemicals according to our preferred cleaning material in the cleaning instruction or others cleaning materials certified by Supplier.

10.5 Instruction for cleaning

All parts critical for cleaning must be indicated in documentation. Critical for cleaning means all electrical or pneumatical covers, so operator is aware. It means also all special places with harder access, so operator is aware about cleaning quality. Critical points are indicated in the cleaning description.

10.6 Maintenance

All parts that need maintenance (i.e. lubrication), regulation, must have an easy access. All operation parts must have an easy access, so the exchange takes no longer that 15 minutes by one technician.

10.7 Special Technical requirements

- The device should be made of stainless steel, not worst tan AISI 304 or AISI 316
- Due to the work in the meat industry, welding and steel processing should be done according to appropriate quality:

- Full welds
- No gaps (potentially a place where bacteria can collect)
- Welds thoroughly smoothed
- No sharp angles
- Mechanical treatment with materials intended for stainless steel
- Moving parts should be properly secured against operator access
- The device should be made in such a way as to ensure easy access for replacement of consumables and for washing

11 General Requirements

Supplier shall fulfill requirement related to the HKScan Standards. In case of standards cannot be met, deviations list must be created

11.1 Quality and food Safety Standards

Supplier should observe the HKScan Quality and Hygiene requirements – **“Appendix Quality and Food Safety requirements”**

11.2 Electrical and component Standards

Supplier should observe the HKScan Electrical standards – **“Appendix HKScan Electrical and Component Standard 1.2”**

11.3 Safety requirements for food product machinery

Supplier should observe the HKScan safety requirements – **“Appendix Safety requirements for food product machinery”**

12 Documentation

All documentation in Polish and English language in 3 copies. Electronic version of documentation in .pdf format is required.

13 FAT & SAT

13.1 FAT

Factory Acceptance Tests (FAT) are considered as **Hold point** for the Purchaser and the invitations need to be sent to the Purchaser 14 days beforehand. Factory acceptance tests shall be performed according to the procedure approved by the Purchaser. The procedure shall determine all the test steps, applicable European or international performance and acceptance standards and acceptance criteria of each step. The conformity assessment procedures or conformity assessment category to be applied shall be informed as a part of Document Package 1. The Supplier shall follow the Site specific safety and hygiene instructions provided by the Purchaser.

13.2 SAT

Site Acceptance Tests (SAT) are considered as **Hold point** for the Purchaser. SAT shall be performed according to the procedure approved by the Purchaser. The procedure shall determine all the test steps, applicable European or international performance and acceptance standards and acceptance criteria of each step.

Among various combinations of product types and process yields, the purchaser will select four (4) scenarios for which performance tests will be conducted according to the above parameters. Each of these tests will not exceed 6 hours.

Pre-Selected Articles that will be taken during SAT

Product type	Yield [%]	Fried away [%]	kg in / kg out	SAT duration [h]
Bit	35%	65%	200 / 100	6 h
Lardong	50%	50%	285 / 100	6 h
Slices	35%	65%	285 / 100	6 h
Slices	50%	50%	200 / 100	6 h

Following parameters must be confirmed during SAT:

- Capacity must be confirmed
- Final product fried level must be confirmed
- Final product temperature at the outlet of the system must be confirmed
- Final product structure and appearance must be confirmed

1.1 Glossary

Hold point shall refer to an inspection for which advance invitations have been sent to the Purchaser by e-mail and whose supervision is a condition for proceeding with the work unless the Purchaser has given written permission to proceed without his presence.