

# Alfa Laval AlfaPlus™

## A continuous process for high-yield surimi processing

### Introduction

AlfaPlus™ is a continuous, hygienic and automatically controlled surimi processing line. The use of centrifugal separation instead of the rotary screens and presses used in conventional surimi processing increases yields substantially as well as eliminating several process stages.

### Applications

- Fish and seafood processing
- Vegetable protein processing

### Benefits

- Handles all kinds of fish, in fillets or trimmings
- Exceptional flexibility in handling capacity changes
- Compact and easily modified to fit existing plants

### Working principle

To isolate the fish proteins from minced fish, the mince is first mixed with conditioned water in a mixing tank. The washing takes place continuously and the ratio of mince to water is automatically monitored and precisely adjusted. This feature ensures optimum conditions since the washed mince is then pumped to the refining stage where the fish proteins are effectively separated from non-muscle tissue such as bone, skin, connective tissue and other impurities.

For whitefish, the refined slurry is continuously pumped to the decanter centrifuge for separation of water and fish mince. If dark-fleshed or fatty fish are being processed into surimi, a second washing stage may be necessary before decanting. All Alfa Laval surimi decanters are equipped with the unique Alfa Laval Direct Drive System®, an automatic solid control system that ensures a consistent moisture content of 82% or less.

The dewatered mince from the decanter is pumped to a blending system where it is mixed with sugars, sorbitol and polyphosphates to prevent freeze denaturation. The mixer is equipped with a cooling jacket, which keeps the temperature as low as possible and maintains the high quality of the fish protein.

The surimi enters an extruder, which forms the surimi into blocks that are then frozen.

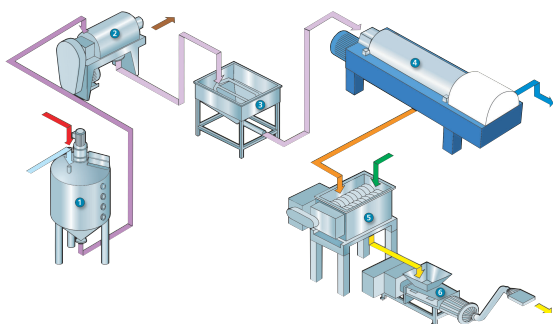










### Design

The AlfaPlus system produces surimi from butterfly cuts (with or without the backbone attached), fillets or trimmings. Protein losses from washing and dewatering are kept to a minimum in the AlfaPlus system equipped with Alfa Laval decanters specially designed and optimized for surimi processing. The combination of the optimal decanter configuration and process control allows seafood processors to recover 70% of the incoming mince into high-quality surimi.

**Sanitary production:** The AlfaPlus line improves sanitary levels by using CIP (Cleaning-in-Place) procedures that reduce the number of man-hours necessary to complete cleaning of the process line. Tanks, pumps and decanters can be automatically cleaned on a daily basis by the attached CIP module. The total cleaning cycle lasts about 21/2 hours, and during this time the refiner, mixer and extruder can be manually cleaned. Daily cleaning significantly reduces the bacterial count.

**Flexible production planning:** AlfaPlus not only makes existing production more flexible and more efficient, but also adds more hours to the production schedule. In an AlfaPlus plant, for example, different raw materials such as lean and fatty fish species can be processed in successive cycles. The production time is reduced to about fifteen minutes compared with two hours in a conventional surimi processing system.



	Conditioned water	1. Mixing tank 1
	Mince slurry	2 Refiner
	Discharge	3. Mixing tank 2
	Refined slurry	4. Decanter centrifuge
	Drain	5. Mixer
	Dewatered mince	6. Extruder
	Additives	
	Surimi	

## Options

### • Fish mince Module

The AlfaPlus system can be modified to produce a washed fish mince from species not suitable for surimi production. The fish mince is mixed in the washing tank to wash out blood and odour, and is then pumped to the refiner to separate meat from impurities. The refined slurry is continuously pumped to the decanter centrifuge to separate the mince from water. The Direct Drive solids control system ensures a moisture content of 80–82%. The mince is ready for packing after leaving the decanter centrifuge.

### • Recovery line

Backbones or frames can be further processed to increase recovery compared with conventional systems. To reduce the amount of fresh water required, wash water from a conventional line can be used to increase yield. Water and minced meat from frames are mixed in a washing module, refined and dewatered in a decanter centrifuge. The dewatered surimi can be mixed into a secondary grade surimi line. The yield can thus be increased by up to 20% with a minimal investment.

### • Data Logging System

An optional data logger allows processors to document the quality of the final surimi and to thoroughly analyse the production flow and optimize the results.

## Technical data

Surimi specification	Typical figures	
<b>Fish species</b>	Moisture	74–76%
Pollack; Cod; Hake; Arrowtooth flounder; Pink salmon	Gel strength <sup>1</sup>	450–1000 g/cm
	Colour	L= 76–80 units b< 4
	Defects	5–9

<sup>1</sup> Depending on the quality of the fish

Plant characteristics/ Plant type <sup>1</sup>		AlfaPlus 350	AlfaPlus 1000	AlfaPlus 2000
Throughput mince	kg/h	350–500	1.300–1.500	2.600–3.000
	Lbs/h	720–1,100	2,860–3,300	5,720–6,600
Power consumption	kWh/h	65	110	188
	HP/h	87	147	252
Water consumption	l/h	750–2.000	4.000–10.000	8.000–20.000
	Gal/min	3–9	17–44	35–88

<sup>1</sup> Approximate throughputs and consumption figures

This document and its contents is owned by Alfa Laval Corporate AB and protected by laws governing intellectual property and thereto related rights. It is the responsibility of the user of this document to comply with all applicable intellectual property laws. Without limiting any rights related to this document, no part of this document may be copied, reproduced or transmitted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise), or for any purpose, without the expressed permission or authorized by Alfa Laval Corporate AB. Alfa Laval Corporate AB will enforce its rights related to this document to the fullest extent of the law, including the seeking of criminal prosecution.

## How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at [www.alfalaval.com](http://www.alfalaval.com)