

Dairy Product  
Industries  
Stainless Solutions

**UGITECH**

Providing special steel solutions



# Which grades for which equipment?

Equipment	End market	Stainless portion	Temperature (°C)
Tank with stirrer	All dairy products	Stirrer, cover hinges and handles, drainage valves (butterfly, ball valves), grid for tanks with complete opening, connections, taps, screws for leg adjustment, pumps (washing, ice water, etc.), handrail, ladder	0 to 35 °C
Refrigerated tank truck	All dairy products	Pumps, valves, ladder, handrail	0 to 4 °C
Refrigerated storage tank	All dairy products	Stirrer, cover hinges and handles, drainage valves (butterfly, ball valves), grid for tank with complete opening, connections, taps, screws for leg adjustment, pumps (washing, ice water, etc.), handrail, ladder	0 to 4 °C
Centrifuge	All dairy products	Valves, pumps, floaters	0 to 4 °C
Homogenizer	Milk, Yogurt		40 to 70°C
	Ice cream		40 to 70°C
Bulk pasteurizer	Milk, Yogurt	Stirrer	63°C for 30 min, then lowered to 4-6°C
	Cream, Butter	Stirrer	63°C for 30 min, then lowered to 4-6°C
Plate and tubular heat exchangers	Milk, Cheese, Cream, Butter, Yogurt	Spacer blocks for exchanger plates	30-140°C for a few seconds, then lowered to 4-6°C
	Ice cream	Spacer blocks for exchanger plates	30-140°C for a few seconds, then lowered to 4-6°C
Packaging machine, non-aseptic	Milk, Cream, Yogurt	Valves, dosers, pumps, nozzles, pistons	0 to 70°C
Packaging machine, aseptic (Tetra-pak, Combibloc)	Milk, Cream	Valves, dosers, pumps, nozzles, pistons	0°C
Ultrafiltration equipment	Cheese		40-50°C
Maturation tank	Cheese, Ice cream, Cream, Butter	Drive shafts, pins, valves, flanges, tank support, handrail, stirrer	Cheese: 10-15°C for 20 h. Ice cream: 4-6°C for 4-12h, Cream: 12-18°C for 16-20h, Butter: 11-20°C for 6-24h
Coagulator-Brewer	Cheese	Stiring shaft + blade	30-35°C
Cheese racks	Cheese	Cheese rack grids	10-12°C for 2 to 6 weeks or, 8-10°C for 2 to 6 months, or 12-14°C for 3 to 12 weeks, or 11-15°C for 1 to 12 months
Curd slicer	Cheese	Wire in the curd slicer	30 - 35 °C
Electric bit, Needles	Cheese	Needles	15°C
Press	Cheese	Piston, pin	15 - 30 °C
Butyrate machine	Butter	churning cylinder + mixer, kneading cylinder, molds, pumps	9-10°C
Churn	Butter	rotating blades / dashers inside the drum	8-13°C
All equipment	All dairy products	All stainless portions	All temperatures
Equipment of which a portion is machined	All dairy products	Machined portions	All temperatures

Environment	Grades AISI standards	Problems encountered	Solutions recommended
Raw milk	304	Price volatility	UGI 4062
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Milk	316	Price volatility	UGI 4362 (35N)
Mixture of milk, cream, sugar, eggs	316	Price volatility	UGI 4362 (35N)
Milk	304L	Price volatility	
	316L	Price volatility	UGI 4362 (35N)
Cream	304L	Price volatility	
	316L	Price volatility	UGI 4362 (35N)
Milk, Cheese, Yogurt -> Milk Cream, Butter -> Cream	316 - 316L	Price volatility	UGI 4362 (35N)
Mixture of milk, cream, sugar, eggs	316 - 316L	Price volatility	UGI 4362 (35N)
Milk, Cream, Yogurt	316L	Price volatility	UGI 4362 (35N)
Milk, cream	316L	Price volatility	UGI 4362 (35N)
Milk	316L	Price volatility	UGI 4362 (35N)
Cheese -> Milk Ice cream -> Mix Butter Cream -> Butter	304	Price volatility	UGI 4062
	304L - 316L	Price volatility	UGI 4362 (35N)
	630	/	630: a good compromise between mechanical properties/ corrosion resistance
Milk/Cheese	304	Price volatility	UGI 4062
	316	Price volatility	UGI 4362 (35N)
Cheese (presence of salt)	304 - 304L	Corrosion on welds	UGI 4362 (35N), better performance than the 304 or 304L and more economical than the 316
Cheese (presence of salt)	304	Price volatility	UGI 4362 (35N)
Cheese (presence of salt)	304 - 316	Price volatility	UGI 4362 (35N)
Cheese (presence of salt)	304 - 316	Price volatility	UGI 4362 (35N)
Butter	304	Price volatility	UGI 4062
Butter	304	Price volatility	UGI 4062
All environments	304 - 316	Cleaning poorly performed > Corrosion	<ul style="list-style-type: none"> <li>Respect cleaning procedures</li> <li>Stainless steel more corrosion resistant if cleaning cannot be controlled: UGI 4362 (35N)</li> </ul>
All environments	304 - 316 - 630...	Difficult to machine certain portions of the equipment	Use a stainless grade with improved machinability, available in UGITECH's UGIMA® range.

Note:  
Another problem  
occasionally encountered:  
welds poorly done  
> microcracks in the  
welds > contamination  
via these microcracks in  
the welds. In this case the  
recommended solution is  
to ensure that the surface  
of the welded area is not,  
or only slightly, rough,  
by surfacing the welded  
area with pickling or  
mechanical brushing.

# Good cleaning practices in the agrofoods industry

## General practices

	<b>Our advice</b>	<b>Deviations</b>
<b>Optimize equipment design</b>	Avoid "dead" zones	An accumulation of food and/or cleaning residues
	Pickle the welds	Welding oxide residues
<b>Pay close attention to surface finishing</b>	Reduce surface roughness, either with mechanical or electrolytic polishing, or with grinding	Rough surfaces
<b>Respect the composition of cleaning solutions</b>	Respect the concentrations recommended by the manufacturer, taking into account the quality of the dilution water	Excessive dosage of products
		Insufficient dosage of products
		"Hard" dilution water causing scale build-up
<b>Respect cleaning performance conditions</b>	Respect the time / temperature conditions recommended by product manufacturers and complying with the existing regulatory requirements	Temperature too high
		Temperature too low
		Cleaning time too long
		Cleaning time too short
<b>Use the appropriate cleaning equipment</b>	Prefer high pressure cleaning, soft brushing (synthetic fibers, tampico, stainless steel wool, etc.)	The use of hard brushes, non-stainless metal scouring pads, abrasive powders
<b>Use the appropriate products</b>	Never use: hydrochloric acid , hot concentrated bleach, "miracle" products of unknown composition, "waxing" protection products	Use of hydrochloric acid
		Use of hot, concentrated bleach
		Use of products of unknown composition
		Use of "waxing" protection products
<b>Don't neglect rinsing operations</b>	The intermediate and final rinsing are indispensable to maintain hygiene and minimize corrosion risks	Insufficient intermediate rinsing
		Final rinsing neglected

The reference texts

## Consequences of deviations

- Increase in dirt accumulation and the risks of corrosion under the deposits (crevice corrosion)
- Difficult to maintain hygiene
- Risk of contaminating the manufactured products and possible impact for consumer (taste, bacterial pollution).

- Lower corrosion resistance;
- Risk of contaminating the manufactured products if these oxides break loose.

- An increase in dirt accumulation speed
- > Cleaning is more difficult;
- > Lower corrosion resistance.

- Increased risk of corrosion;
- Difficult to rinse; Unnecessary extra cost.

- Results unsatisfactory;
- Hygiene not guaranteed, with possible impact on consumer health.

- Need to increase the active ingredient concentration > additional operating costs;
- Scale formation in installations > Increase in dirt accumulation and the risks of corrosion under the deposits .

- Higher energy costs;
- Possible decomposition of detergents / disinfectants;
- Increased risk of corrosion.

- Unsatisfactory results;
- Hygiene not guaranteed, with possible impact on consumer health.

- Additional operating costs linked to production downtime;
- Possible decomposition of detergents / disinfectants;
- Increased risk of corrosion.

- Unsatisfactory results;
- Hygiene not guaranteed, with possible impact on consumer health.

- An increase in roughness that can generate problems due to sticking and an increased risk of corrosion;
- Incrustation of abrasive particles, with risks of corrosion under these particles.

- Rapid corrosion of the installations.

- A loss of disinfectant power due to decomposition;
- Increased risk of corrosion by these decomposition by-products

- An illegal situation

- Subsequent dirt accumulation worsened by the presence of a grip undercoat

- Risks that the cleaning products will "neutralize" each other (eg. acid cleaning/alkaline cleaning), reducing cleaning effectiveness;
- Increased risks of corrosion due to unwanted reactions between cleaning products

- Cleaning product and food processing residues remain
- > Contamination of the food products manufactured, with an impact on their quality and possible impact on consumer health;
- > Increased risk of corrosion

## Standards

- NF A 36711 (AFNOR – 2002): Stainless steels designed for contact with food
- BP A 36720 (AFNOR – 2001): Maintenance of stainless steels used for food or health applications;
- Pr En 1642-2 (AFNOR – 2003): Machines for food products – Fundamental notions: recommendations related to hygiene.

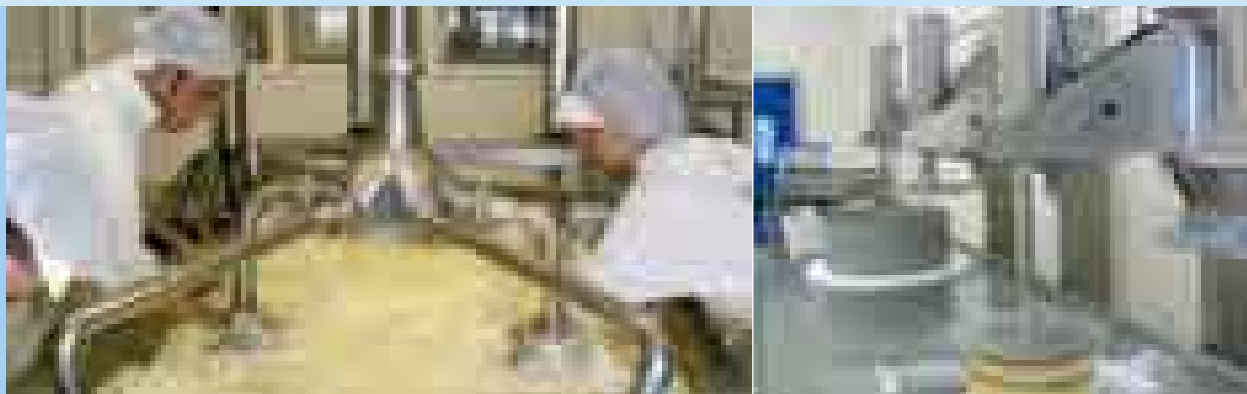
## Regulatory texts

- Rule (CE) N°852/2004 of the European Parliament and the Council of April 29, 2004 related to food product hygiene (and 852 / 853 concerning hygiene and inspection rules);
- French decree of September 8, 1999 – for the application of article 11 of the decree 73138 of February 12, 1973 (modified) – entailing the application of the law of August 1, 1905 on fraud and falsification concerning the processes and products used to clean materials and objects in contact with foods, products and beverages used to feed humans and animals.

# Good cleaning practices for the agrofoods industry

## Specific dairy industry practices

	Good practice	Predictable behavior of stainless steels with respect to the risks of corrosion and mechanical problems-Ugitech's opinion
<b>The products</b>	Acid detergents: they are indispensable to eliminate milkstone	The most frequently used acids are the "oxidant" type (nitric acid, phosphoric acid). They have no corrosive effects on stainless steels, provided that the other cleaning parameters are strictly complied with (time, temperature, rinsing)
	Simple alkaline detergents ( soda type): they allow the elimination of organic dirt	The corrosion risks are low, since "simple" alkaline products are not corrosive for stainless steels; However, beware: excessively high temperatures (>70°C) cause coagulation of proteins, aggravating dirt accumulation.
	Detergents / disinfectants	Corrosion risks can increase with these complex products (alkaline-chlorated) supposed to trigger disinfection: the higher the temperature, the more aggressive the chlorated molecules (chloramines, hypochlorites) become.
	Disinfectants	The corrosion risks are high with chlorated derivatives, especially if treatment duration is long or temperature is high; They are lower with the other disinfectant families (iodophors, peracetic acid). Quaternary ammonium compounds are forbidden in the dairy industry.
<b>The processes</b>	CIP (Cleaning In Place)	The risks of problems (mechanical, corrosion) are much lower than with manual cleaning thanks to the automation of cleaning phases with precise parameters (product concentration, time, temperature)
	Manual cleaning with a foam gun	Rinsing is difficult in the asperities and "undersides" of the installations (eg. under conveyor belts), leading to an increased risk of corrosion and mechanical problems.



## Ugitech's differentiated offer

- **Semi-finished products**

Billets

■ 50 to 140 mm

Length: 3 to 8 m

- **Bars**

● 1.5 to 250 mm for the austenitics, super-austenitics and the duplex 4462

1.5 to 120 mm for the duplex (excluding the 4462)

◆ 3 to 63 mm for the austenitics and super-austenitics

■ 3 to 50 mm for the austenitics and super-austenitics

Length: 2.5 to 6.2 m

\* Not all diameter/length combinations are available. Please contact us

\* For the grades 4438, XM19, 4439 and 4529: contact us

- **Wire rod**

● 5 to 32 mm for the austenitics and super-austenitics

5.5 to 32 mm for the duplex

◆ 12.4 to 28 mm for the austenitics and super-austenitics Coils of approximately 1000 kg.

\* For the grades 4362, 4507, 4439, 4529, contact us

\* For certain highly alloyed grades, the coils available weigh approximately 450 kg. Contact us

- **Drawn wire**

● Wire: 13 microns to 18 mm; coils, spools, baskets

◆ Profiles: sections from 1 to 60 mm<sup>2</sup>; coils, reels, straightened products

\* Other requests: contact us

\* Flats with round edges, Fibers...: contact us





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## Wire rod

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## Drawn wire

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a team of 2000 working together for you around the world



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