

Meat product
industries
Stainless steel
solutions

UGITECH

Providing special steel solutions



a practical guide for the use of stainless steels

Equipment	End market	Portion made of stainless	Temperature °C	pH	Chemical environment
Knives and cutting tools in general	Cutting: - Slaughterhouses - Industrial and small scale butchers and meat dressers	Blade	4°C to 20°C	5 to 7	High salt content in the prepared/cured/smoked meats
Suspension and conveyor hooks	Suspension and conveyance of meat and meat products in slaughterhouses, butcheries and meat curing plants	Hook	4°C to 12°C	5 to 7	High salt content in the prepared/cured/smoked meats
Extruders	Production and transformation of fresh and/or frozen chopped meat, cured meats	Extrusion die	4°C to 12°C	5 to 7	High salt content in certain preparations based on chopped meat and cured meat
Mixers and stirring machines	Production and transformation of fresh and/or frozen chopped meat, cured meats	Shafts and turbines	4°C to 12°C	5 to 7	High salt content in certain preparations based on chopped meat and cured meat
Freezing racks	Racks supporting meat and meat preparations during freezing	Racks	< 0°C	5 to 7	Not applicable given the very low temperature

Bars, Wire rod, Drawn wire	Grades	Finishing	Problems encountered	Solutions recommended	
Wire rod, Bars	1.4028 1.4116 1.4109 1.4123 1.4112 (1.4125) ⁽¹⁾	Manual or machine polishing	Poor control of heat treatment: presence of carbides associated with zones where chromium has come off increased risk of corrosion	Grades with lower carbon content (if the hardness is sufficient); cryogenic treatments after quenching	
			"Dry" sharpening: overheating: presence of carbides associated with zones where chromium has come off increased risk of corrosion	"Wet" sharpening	
			Cleaning improperly performed: excessive dosage of detergent/disinfectant products, insufficient rinsing increased risk of corrosion	Compliance with cleaning procedures (see cleaning sheet)	
Wire rod, Bars	Steel	Chromium-plated	Chromium plating is chosen for its anti-adherence properties: if a scratch occurs, anticorrosion properties are lost	1.4057 1.4542	Electropolissage
	1.4057 1.4542	Forged, machined, polished	Poor control of heat treatment: presence of carbides associated with zones where chromium has come off increased risk of corrosion	The 1.4542 is easier to control (low carbon) than a conventional martensitic like the 1.4057	
			Cleaning improperly performed: excessive dosage of detergent/disinfectant products, insufficient rinsing, use of abrasives increased risk of corrosion	Compliance with cleaning procedures (see cleaning sheet)	
Bars	1.4125	Machined	Poor control of heat treatment: presence of carbides associated with zones where chromium has come off increased risk of corrosion	Grades with lower carbon content (1.4116N) according to the specifications concerning hardness / abrasion resistance	
			Cleaning improperly performed: excessive dosage of detergent/disinfectant products, insufficient rinsing increased risk of corrosion	Compliance with cleaning procedures (see cleaning sheet)	
Wire rod, Bars	Steel	Chromium-plated	Chromium plating is chosen for its anti-adherence properties: if a scratch occurs, anticorrosion properties are lost	1.4057 1.4542	Electropolishing
	1.4057 1.4542	Forged, machined, polished	Poor control of heat treatment: presence of carbides associated with zones where chromium has come off increased risk of corrosion	1.4542 is easier to control (low carbon) than a conventional martensitic like the 1.4057	
			Cleaning improperly performed: excessive dosage of detergent/disinfectant products, insufficient rinsing, use of abrasives increased risk of corrosion	Compliance with cleaning procedures (see cleaning sheet)	
Wire rod, Drawn wires	1.4301 1.4307	Polished, electropolished	Cleaning improperly performed: excessive dosage of detergent/disinfectant products, insufficient rinsing increased risk of corrosion, especially on welds	Compliance with cleaning procedures (see cleaning sheet)	

Good cleaning practices in the agrofoods industry

General practices

	Our advice	Deviations
Optimize equipment design	Avoid "dead" zones	An accumulation of food and/or cleaning residues
	Pickle the welds	Welding oxide residues
Pay close attention to surface finishing	Reduce surface roughness, either with mechanical or electrolytic polishing, or with grinding	Rough surfaces
Respect the composition of cleaning solutions	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
Respect cleaning performance conditions	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
Use the appropriate cleaning equipment	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
Use the appropriate products	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
Don't neglect rinsing operations	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
<ul style="list-style-type: none"> - 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).
<ul style="list-style-type: none"> - Lower corrosion resistance; - Risk of contaminating the manufactured products if these oxides break loose.
<ul style="list-style-type: none"> - An increase in dirt accumulation speed > Cleaning is more difficult; > Lower corrosion resistance.
<ul style="list-style-type: none"> - Increased risk of corrosion; - Difficult to rinse; Unnecessary extra cost.
<ul style="list-style-type: none"> - Results unsatisfactory; - Hygiene not guaranteed, with possible impact on consumer health.
<ul style="list-style-type: none"> -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 .
<ul style="list-style-type: none"> - Higher energy costs; - Possible decomposition of detergents / disinfectants; - Increased risk of corrosion.
<ul style="list-style-type: none"> - Unsatisfactory results; - Hygiene not guaranteed, with possible impact on consumer health.
<ul style="list-style-type: none"> - Additional operating costs linked to production downtime; - Possible decomposition of detergents / disinfectants; - Increased risk of corrosion.
<ul style="list-style-type: none"> - Unsatisfactory results; - Hygiene not guaranteed, with possible impact on consumer health.
<ul style="list-style-type: none"> - 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.
<ul style="list-style-type: none"> - Rapid corrosion of the installations.
<ul style="list-style-type: none"> - A loss of disinfectant power due to decomposition; - Increased risk of corrosion by these decomposition by-products
<ul style="list-style-type: none"> - An illegal situation
<ul style="list-style-type: none"> - Subsequent dirt accumulation worsened by the presence of a grip undercoat
<ul style="list-style-type: none"> - 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
<ul style="list-style-type: none"> - 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

<p>Standards</p> <ul style="list-style-type: none"> • 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.
<p>Regulatory texts</p> <ul style="list-style-type: none"> • 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 in the agrofoods industry

Meat industries .

	Practice	Probable behavior of the stainless steel with respect to risks of corrosion and mechanical problems Ugitech's opinion
Products	Acid detergents: they are rarely used except to occasionally remove scale build-up due to the process water and an "overhaul" of the installations	<ul style="list-style-type: none"> • Acid cleaning is rare, and not included in the normal hygiene maintenance procedure. The risk is that just anything will be used (e.g. hydrochloric acid, to be avoided at all costs) • The recommended acids are of the "oxidant" type (nitric acid, phosphoric acid). They have no corrosive effect on stainless steel, provided that all the other cleaning parameters are strictly complied with (time, temperature, rinsing).
	Simple alkaline detergents (soda type) that help eliminate organic soil buildup	<ul style="list-style-type: none"> • The risks of corrosion are low, and "simple" alkaline products are not corrosive for stainless steel; • However, excessively high temperatures (>70°C) cause protein coagulation and an aggravation of soil buildup, particularly adherent with meat products.
	Detergents / disinfectants	The risks of corrosion can increase with these complex products (chlorinated-alkaline) intended to start the disinfection process: the chlorinated molecules (chloramines, hypochlorites) become more aggressive as the temperature rises.
	Disinfectants	<ul style="list-style-type: none"> • The risks of corrosion are high with chlorine derivatives, especially if duration is long or treatment temperature high; • They are lower with other disinfectant families (iodophors, peracetic acid) • Quaternary ammoniums are prohibited in the meat industries.
Processes	CIP (cleaning in place): not very frequent in slaughterhouses, its use is spreading in transformation plants (automatic machines manufacturing chopped meat, pet food)	The risks of problems (mechanical, corrosion) are lower than with manual cleaning thanks to the automation of the cleaning phases with precise parameters (concentration of the products, time, temperature).
	Manual cleaning with a foam gun	Rinsing is difficult in the uneven areas and the "undersides" of installations (ex. undersides of conveyor belts) with increased risks of corrosion leading to mechanical problems.
	Manual cleaning of "small equipment" (knives and cutting tools)	Bad practices are frequent (prolonged soaking of knives in disinfectants) and the risks of corrosion can be very high. In addition to corrosion phenomena, there is a loss of cutting capacity of the equipment.



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 mm²; coils, reels, straightened products

* Other requests: contact us

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





UGITECH production plants

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Drawn wire

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