Technical Data Sheet
UGIMA® 4307HM

Chemical analysis (%)

C	Si	Mn	Ni	Cr	Cu	Mo	N	P	S
≤0.03	≤ 0.75	0.5 – 1.5	9.0 – 9.5	18 – 19	<0.75	≤0.5	<0.10	<0.040	0.025 – 0.030

22-06-2010 – REV03

General presentation

UGIMA® 4307HM is an improved machinability stainless steel manufactured only by Ugitech. Its properties are identical to those of UGIMA® 4307 except for its machinability, which is even better:

UGIMA® 4307HM is the first stainless steel produced by the method of inclusion population development and control, UGIMA® 2, perfected by Ugitech.

UGIMA® 4307HM's new technological advances are extremely advantageous, whatever the machining conditions, machine or tooling used. Productivity increases of 10 % to 25 % have been obtained over our UGIMA® 4307. A significant improvement in tool service life of up to 50 % has also been noted.

Classification

Improved Machinability Austenitic Stainless Steel.

Designation

Material No.

Europe – EN		USA – UNS	Japan – JIS	World – ISO
1.4307	X2CrNi18-9	S30403	SUS304L	4307-304-03-I
1.4301	X5CrNi18-10	S30400	SUS304	4301-304-00-I

Other material name

USA (AISI)	France (AFNOR)	Germany (DIN)	UK (BS)	Sweden (S.S)
304L	Z3CN 18-10	W.Nr 1.4307	304S11	2352
304		W.Nr 1.4301		

Standards

EN	EN 10088
ASTM	A276, A476
AMS	AMS 5647, AMS-QQ-S-763
ISO	ISO 15510

Mechanical properties

Tensile data

	Temperature	Tensile strength	Yield strength	Elongation	
	T (°C)	Rp0,2% (MPa)	Rm (MPa)	A (%)	T (°C)
Solution annealed	20	≥ 200	500 -680	≥ 48	≥ 68
Drawn	20	≥ 380	650 –830	≥ 32	≥ 65

Limit values for information only

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Physical properties

Temperature	Density	Elastic modulus	Thermal conductivity	Expansion coefficient From 20 to 200°C	Electrical resistivity	Specific heat
(°C)	(kg/dm^3)	(GPa)	(W/m.°C)	(°C^{-1})	(µΩ.mm)	(J.kg^{-}°C)
20	7.90	200 000	15		730	500
100		194 000		16,0 x10^{-6}		
200	-	186 000		16,5 x10^{-6}	-	-
300		179 000		17,0 x10^{-6}		
400		172 000		18,0 x10^{-6}		
500		165 000		18,0 x10^{-6}		

(Indicative values)

Magnetic and electrical properties

Non-magnetic in annealed condition.
Slight magnetism produced by cold-finishing operations.

Corrosion resistance

UGIMA® 4307HM has an excellent ability to withstand corrosion in many environments. Its corrosion resistance is typical of an austenitic steel and is similar to that of 4307 / 304L in every respect.
The use of UGIMA® 4307HM is compatible with all the fluids, lubricants, oils and greases used in the machining industry.
However, UGIMA® 4307HM is not recommended for use in marine environments and highly oxidising chemical environments.

Environment	Behaviour
Nitric acid	Good
Phosphoric acid	Average
Sulphuric acid	Average
Acetic acid	Average
Sodium carbonate	Average
NaCl (Saline mist)	Good
Humidity	Good
Sea water	Restricted use
Oil	Average

Special care must be taken when using UGIMA® 4307HM in acid or chloride environments that are liable to pitting and crevice corrosion: it should not be used where components are shaped in such a way as to have areas where corrosive products might collect and corrode. Optimum corrosion resistance is obtained where a surface is free from all traces of machining oil or foreign particles (of iron for example).
UGIMA® 4307HM is pickled in the same way as 304L grade steel. This also applies to decontamination.

The corrosion resistance of a stainless steel depends on many factors related to the composition of the corrosive atmosphere (chloride concentration, presence or absence of oxidizing agents, temperature, pH, agitation or no agitation, and so on), as well as to the preparation of the material (surfaces free from metal particles, surface finish, such as hardening, polishing, and so on). Precautionary measures should be taken for certain tests such as the saline mist test (French standard NFX 41002): for example marking labels that might cause corrosion run-outs and reduce the test resistance time should not be used on the sample.

Swiss Steel Group

Production sites: Ugitech SA
www.swisssteel-group.com

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Hot transformation
Forging
Heating: 1170°C to 1250°C; finish the work at a temperature higher than 900°C.

Machinability
The performance of UGIMA® 4307HM in machining is exceptionally good, as a result of the optimisation of the inclusion population. This is true not only for very high speeds or severe cutting conditions, as a result of the UGIMA® 2 process, but also for low speeds or less severe cutting conditions, because of the new improvements achieved through this latest development. UGIMA® 4307HM is therefore particularly appropriate for screw machining, as its improved machinability is effective through an extensive range of cutting conditions and machining operations. Its performance is based on extremely good chip breakability, extended tool life and excellent surface finish. If you would like to use the grade to best advantage for your components and working environment, contact our Technical Service.

Welding
UGIMA® 4307HM can be welded in the same way as UGIMA® 4307, without preheating or post welding heat treatment, using all the electric arc procedures (MIG, TIG with or without filler material, coated electrodes, Plasma, etc.), by laser, resistance (spot or seam), friction, electron steam welding, and so on.

If a filler wire is used, the MIG ER308LSi (1.4316) grade is recommended. The shielding gases that can be used are Ar+ 1 to 3% CO_2 or 1 to 2% O_2.

Heat treatment
The annealing treatment that gives UGIMA® 4307HM its lowest properties includes heating to 1000 - 1100°C, followed by rapid air or water cooling.

Available products

Product	Shape	Surface finish	Tolerance	Dimension	
Bar	Round	Rolled and descaled	12 to 13	22 to 130	mm
		Turned and polished	9 to 11	22 to 130	mm
		Drawn	8 to 9	1.8 to 55	mm
		Ground	7 to 9	1.8 to 80	mm
	Hexagonal	Drawn	11	3 to 55	mm
Drawn wire	Round	Mat		1 to 14	mm

Other formats: contact us

Applications
- General component production
- Chemical industry
- Building and construction, Transportation
- Electronic equipment, Transportation
- Oil, petrochemical and nuclear industries
- Food-processing and agricultural industries
- Decorating and household equipment

Swiss Steel Group

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