Technical Data Sheet
UGIMA® 4570

Chemical analysis (%)

C	Si	Mn	Ni	Cr	Cu	Mo	P	S
0.04 – 0.08	≤ 0.75	1.5 – 2.0	8.0 – 9.0	17.0 – 18.0	1.4 – 1.8	≤ 0.5	≤ 0.040	0.25 – 0.35

03-04-2009 – REV 04

General presentation

UGIMA® 4570 is an improved machinability stainless steel manufactured only by UGITECH.

Its properties are identical to those of 303, except for its machinability, which is even better.

- The SULPHUR + COPPER + UGIMA® Process synergy achieves previously unimaginable, but now unrivalled machining performances: cutting speed up to 750 m/min during turning with a coated carbide insert.
- Similarly, this synergy provides improved chip breakability and tool life and increases productivity by up to 70% over 1.4305 (303) and 20% over UGIMA® 4305.
- The addition of copper reduces sensitivity to cold work-hardening compared with 1.4305 and improves machining operations such as knurling, deep drilling, threading and tapping by rolling, as well as bending and crimping (door and cupboard handles).

Classification

Improved Machinability High Sulphur Austenitic Stainless Steel with copper

Designation

Material No

Europe	USA	Japan
EN	**ASTM**	**SUS**
10088-3 : 1.4570 X8CrNiCuS 18-9-2		303 Cu

Other material name

USA	France	Germany	UK	Sweden
AISI	AFNOR	DIN	BS	S.S

Mechanical properties

Tensile data

	Yield strength	Tensile strength	Elongation
	$YS_{0,2}$	UTS	E
	(MPa)	(MPa)	(%)
COLD-DRAWN BARS depending on the hardening rate applied	350/450	640/820	27/44
TURNED BARS	260/330	570/620	55/60

(limit values for information only)

Physical properties

Temperature	Density	Weight of round bars	Elasticity module (Young)	Thermal conductivity	Expansion ratio	Thermal conductivity
(°C)	(kg/m^3)	D^2 (D= ∅ of the bar)	(N/mm^2)	(W/m.°C)	(/°C)	(µΩ.mm)
20	7900	0.0062	193000	16.7	16.5 X 10^{-6} °C	700

Swiss Steel Group

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

Technical Data Sheet
UGIMA® 4570

Chemical analysis (%)

C	Si	Mn	Ni	Cr	Cu	Mo	P	S
0.04 – 0.08	≤ 0.75	1.5 – 2.0	8.0 – 9.0	17.0 – 18.0	1.4 – 1.8	≤ 0.5	≤ 0.040	0.25 – 0.35

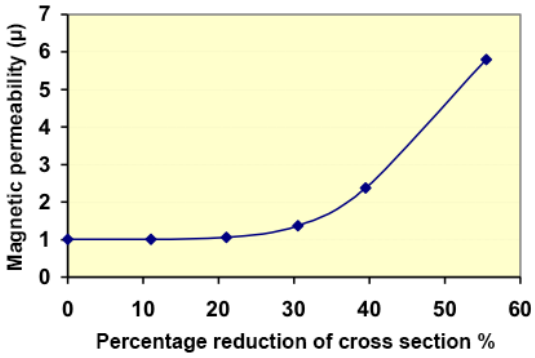
03-04-2009 – REV 04

Magnetic and electrical properties

Austenitic, therefore non-magnetic grade after annealing at 1000/1100°C (magnetic permeability μ < 1.03).

The addition of 1.4/1.8 % of copper (gamma element) improves the stability of the grade even more, making it less susceptible to work-hardening phenomena and very highly suitable for applications requiring low levels of magnetic permeability (see beside).

Effect of the reduction of cross section on permeability



Corrosion resistance

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

UGIMA® 4570 has excellent ability to withstand corrosion in many environments. Its corrosion resistance is typical of an austenitic steel and is slightly better than that of 1.4305 (303).

- The use of UGIMA® 4570 is compatible with all the fluids, lubricants, oils and greases used in the machining industry.
- However, UGIMA® 4570 is not recommended for use in marine environments and highly oxidising chemical environments.

In addition, as with all high sulphur steels, special care must be taken when using UGIMA® 4570 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® 4570 is pickled in the same way as 303 grade steel.

Decontamination of steels with a high sulphur content is not recommended, owing to the complexity and cost of this operation; however, if it is necessary, the recommended decontamination / passivation process is as follows:

1 volume 52% nitric acid (36° Baumé), 1 volume water, ambient temperature, short duration, wash carefully when the process is completed.

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 oxidising 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 test piece.

Swiss Steel Group

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

Technical Data Sheet
UGIMA® 4570

Chemical analysis (%)

C	Si	Mn	Ni	Cr	Cu	Mo	P	S
0.04 – 0.08	≤ 0.75	1.5 – 2.0	8.0 – 9.0	17.0 – 18.0	1.4 – 1.8	≤ 0.5	≤ 0.040	0.25 – 0.35

03-04-2009 – REV 04

Hot transformation
Forging
UGIMA® 4570 should not be forged. However, if this operation is indispensable, the material should be heated to 1175 - 1205° C and the work should be finished at a temperature higher than 955°C.

Machinability
The performance of UGIMA® 4570 in machining is exceptionally good, as a result of the sulphur + copper UGIMA® synergy. This is true for very high speed or severe cutting conditions, as a result of the UGIMA® process, but the addition of copper reduces sensitivity to cold hardening by machining and is beneficial for machining operations such as knurling, deep drilling (>4xD) and threading and tapping by rolling.
The cutting conditions shown in the tables below are those which we established in the trial phase of the development of UGIMA® 4570. If you would like to use the grade to best advantage for your components and working environment, contact our Technical Service.

Welding
Like all stainless steels with a high sulphur content, UGIMA® 4570 is very difficult to weld, due to the almost inevitable phenomenon of thermal weld cracking. This is particularly true in the case of welding without the use of filler material.
If a weld is required, it is recommended that ER312 welding wire be used as the filler metal to minimise thermal cracking problems. Heat treatment must not be performed after welding with ER312 wire.

Available products

Product	Finish	Tolerance	Dimension
Bars	Hot rolled and descaled	13	22 – 130 mm
	Cold-finished drawn, turned, ground	6 to 11	2,0 – 130 mm

For others, please contact us.

Applications
- Transport
- Electronic equipment
- Decorative use and household equipment
- etc.