

Rexmed Instruments Material Specifications:

A On the following pages you can find information about the materials, used by [REXMED INSTRUMENTS](#) for manufacturing several kinds of instruments.

Definition “High Grade Steel”:

The standardized term “High Grade Steel” used by many manufactures as a special characteristic of their products does not say more than steel’s cleanness, concerning the unwanted alloy components phosphorus and Sulphur do not exceed perceptual limits. A high-alloyed tool-steel can also be a “High Grade Steel”.

Sources of Supply:

The [REXMED INSTRUMENTS](#) purchases all materials for 1A products, as forging for scissors or forceps, from well-known suppliers. We do not have any direct influence on the production of these materials, but we are successfully trying to keep the quality of our products on a high level constantly, by careful selection of our supplier.

High Grade Stainless Steel:

Mat.Nº: 1.4117

Used for: Scissors, Bone Rongeurs, Bone Cutting Forceps, Concho tomes, Scalpels, Knives, Chisels, Curettes, Sharp Spoons, Dental Probes, and Dental Drills.

Shortcut: X 38 CrMoV 15(DIN 17442)

Characteristics: Martensitic, Magnetic, Hardness (hardened) 50-58 HRC Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
0.35-0.4	≤1	≤1	≤0.045	≤0.03	14-15	0.4-0.6	-	-	-

Mat.Nº: 1.4021

Used for: Scissors with TC Inlets, Diss. Forceps, Ring Forceps, Bone Rongeurs, Bone Cutting Forceps, Forceps, Concho tomes, Retractors, Rigid Probes, Chisels, Curettes, Sharp Spoons, Springs, Full Handles, Screws, Nuts, Dental Pliers, Extractors, Drills.

Shortcut: X 20 Cr 13 (EN 10088,-1,-2,-3, DIN 17440, 17441, 17442)

Type/Grade of the material: AISI 420

Characteristics: Martensitic, Magnetic, Hardness (Hardened) 40-47 HRC Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
0.16-0.25	≤1	≤1.5	≤0.044	≤0.03	12-14	-	-	-	-

Mat.Nº: 1.4034

Used for: Scissors, Rongeurs, Bone Cutting Forceps, Concho tomes, Scalpels, Knives, Dental Probes, Drills, Ales, and Medullary Reamers.

Shortcut: X 40 Cr 13 (EN 10088,-1,-2,-3, DIN 17441)

Characteristics: Martensitic, Magnetic, Hardness (Hardened) 55 HRC Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
0.43-0.5	≤1	≤1	≤0.04	≤0.03	12.5-14.5	-	-	-	-

Mat.Nº: 1.4305

Used for: Probes, Handles (full), Screws, Nuts, Components with low demand.

Shortcut: X 12 CrNiS 18 9 (EN 10088,-1,-2,-3, DIN 17440)

Type/Grade of the material: AISI 303

Characteristics: Machine Steel, Austenitic, Non-Magnetic, not for hardening (18/8) Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
≤0.1	≤1	≤2	≤0.045	0.15-0.35	17-19	-	8-10	≤1	≤11

Mat.Nº: 1.4301

Used for: Suction Tubes, Specula, Retractor Blades, Containers, Flexible Probes, Guide Pins.

Shortcut: X 12 CrNiS 18 8 (EN 10088,-1,-2,-3, DIN 15512T1, 17440,-441,-442,-455,-456,-457,-458,-EEN 10222-5, EEN 10028-7, EEN 10272)

Type/Grade of the material: AISI 304/304H

Characteristics: Austenitic, Non-Magnetic, Malleable (soft). Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
≤0.07	≤1	≤2	≤0.045	≤0.03	17-19.5	-	8-10.5		≤0,11

Mat.Nº: 1.4310

Used for: Springs.

Shortcut: X 12 CrNi 17 7 (EN 10088,-1,-2,-3, DIN 17440,-441,-455 bis 458)

Type/Grade of the material: AISI 301

Characteristics: Spring Steel, Austenitic, Non-Magnetic Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
0.05-0.15	≤2	≤2	≤0.045	≤0.15	16-19	≤0.8	6-9.5		≤0,11

Mat.Nº: 1.4401

Used for: Measuring Gauges for Drills and Nails.

Shortcut: X 5 CrNiMo 18 10 (EN 10088,-1,-2,-3, DIN 1654T5, 5512T3, 17224,-440,-441,-455 bis 458,

Type/Grade of the material: 316

Characteristics: Austenitic, Non-Magnetic Alloy.

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
≤0.07	≤1	≤2	≤0.045	≤0.03	16-18.5	2-2.5	10-13		≤0,11

Mat.Nº: 1.4441

Used for: Implants, Prosthesis.

Shortcut: X 2 Cr Ni Mo 18 15 3 (DIN 17443)

Type/Grade of the material: AISI 316 LVM

Characteristics: Implants Steel All

%C	%Si	%Mn	%P	%S	%Cr	%Mo	%Ni	%CU	N
≤0.03	≤1	≤2	≤0.025	≤0.01	17-19	2.5-3.2	13-15.5	≤0.1	≤0,1

Non-Metals Iron

Mat.Nº:2.0402

Used for: Instruments for low demands

Shortcut: CuZn40Pb2

Characteristics:brass, normally chrome plated

Mat.Nº: 2.1030

Used for: slide-bearings

Shortcut: CuSN8

Characteristics:Bronze

Mat.Nº: 3.3315

Used for: Containers, Handles

Shortcut: AlMg1

Characteristics:Aluminum, lightweight

Mat.Nº: Copper

Used for: Malleable Instruments as probes or spatulas, electric components

Shortcut: Cu

Characteristics: Normally Silver, Chrome or Nickel plated

Mat.Nº: Titanium

Used for: Implants, Clips, standard instruments as forceps or biopsies-forceps.

Shortcut: Ti

Characteristics: Lightweight, Robust, Expensive

Mat.Nº: New Silver

Used for: Malleable Probes

Precious Metals

Silver (Ag)

Mainly used for malleable copper instruments as plating. (Galvanic)

Gold (Au)

Mainly used for marking instruments with TC inlets (galvanic)

Non-Metal Materials (Plastics)

Ferro Zell (HGW 2082)

Pressed material with synthetic resin and cotton .Used for handles and hammers.

Delrin (POM)

Handles, electric insulated components, mandarin

Teflon (PTFE)

Bearings, elected insulated components.

Natural Materials

Wood
Handles, cases
Replaced by synthetic materials more and more
Leather
Cases, pouches

Concluding remark:

These pages are only a rough summary of the used materials for surgical instruments. Normally there are used much more materials in different alloys and characteristics, filling a book. Manufacturer's experience and changes in the manufacturing process make changes inevitable.

Literature/Standards:

Steel Key (Wegst-Verlag)
Table-Book Metal (Europa Lehrmittel)
Steel Standardization in "Fachkundebuch Metal" (Europa Lehrmittel)
DIN 100 Paperback (Beuth Verlag)
DIN 17442 "Forged products or stainless steel for surgical instruments"
DIN 58298 part 1-11 "Materials, construction and testing of surgical instruments"

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