METAL CUTTING BAND SAW MODEL BS-75G

Assembly & Operating Instruction



1. INTRODUCTION

This operation instruction manual conforms to the requirements of the 98/37/EEC Machine Directives and subsequent amendments.

In the light of this, special attention has been given to safety aspects and accident prevention in the work-place for each stage in the machine's "life". Information which could be of particular assistance to the operator has been highlighted.

The "Operating instructions" are an integral part of the machine and should be consulted before, during and after the start up of the machine and whenever else required. The content of these instructions should always be carefully observed.

The observance of the above is the only way to achieve the two fundamental aims of this manual:

• Optimization of machine performance

• Prevent damage to the machine and injury to the operator

The index of the chapters and the index of the drawings, diagrams and tables are contained in chapter 3 and can be used to help the location of specific information.

CAUTION: BEFORE INSTALLING THE MACHINE, READ THE OPERATING INSTRUCTIONS CAREFULLY

2. INFORMATION ABOUT MAINTENANCE ASSISTANCE

2.1 GUARANTEE

- The products are guaranteed against material and manufacturing defects for a period of 12 months from the date of delivery or, if the machine is installed by our employees, from the date of machine start up.
- The buyer is only entitled to the replacement of parts which are acknowledged as faulty: carriage and packing are at the buyer's expense. In the event of the above, the following information should be supplied:
- 1. Date and number of purchasing document
- 2. Machine model
- 3. Serial number
- 4. Code of any relevant drawings
- Requests for compensation for the inactivity of the machine will not be accepted.
- The guarantee does not cover uses which are not in line with these operating instructions which are an integral part of the machine. Nor is maintenance covered if the instructions supplied are not observed.
- The guarantee will not cover machines which have undergone unauthorized modifications.
- Modification or tampering with the safety devices is strictly forbidden.

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4. DESCRIPTION OF THE MACHINE

4.1 SAFETY STANDARDS COMPLIED WITH DURING THE DESIGN AND CONSTRUSTION OF THE MACHINE

The machine produced by us is in compliance with:

• 98/37/EEC Machinery Directive (ex 89/392/EEC, as amended by the 91/368/EEC, 93/94/ECC and 93/68/EEC Directives).

The following Standards apply:

- EN 292-1 1991 Safety of machinery- Basic concepts and general principles for design. Basic terminology and methods.

-	EN 292-2	1991	Safety of machinery. Basic concepts and general principles for design.
			Specifications and technical principles.
-	EN418	1994	Safety of machinery. Emergency stop devices, functional aspects-design principles.
-	EN 983	1996	Safety requirements related to systems and components for hydraulic and pneumatic transmissions.
-	EN 1037	1995	Safety of machinery. Isolation and energy dissipation . Prevention of unexpected start-up.
-	EN 1088	1995	Safety of machinery- Interlocking devices with and without guard- locking General principles and provisions for design
-	EN 60204-1	1998	Safety of machinery. Electrical equipment of machines. Part 1: General requirements Sa.
-	EN 60204-	2 1990	Electrical equipment of industrial machines. Part 2: Item designation and examples of Drawings, diagrams, tables and instructions.

• **89/336/EEC Directive on electromagnetic compatibility**, as amended by the 92/31/EEC, 96/68/EEC, 93/97/EEC and 93/68/EEC

The following Standards apply:

-EN 50081-1 General Standard for emission leve
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-EN 50082-2 General Standard for immunity

• 73/23/EEC Low Voltage Directive, as amended by the 93/68/EEC Directive

4.2 DESCRIPTION OF THE MACHINE AND ITS COMPONENTS

The band sawing machine produced by us has a sturdy frame made from welded and painted sheet-steel. The upper surface is designed to allow the complete draining away of the cutting fluid. The band holding bow is made of cast-iron and has generous dimensions, providing the cutting unit with the necessary strength and precision. The vice unit is also made of cast-iron and clamps the material to be cut securely. The bar-stop device allows the length required to be preset and a constant level of performance for repeated cuts. The blade-holding bow is firmly attached to a reduction unit built onto the motor and to the base by means of a joint which allows 45° rotation to the right and cutting movement with manual feed. The coolant pump is fitted to the machine base.

A changeover switch is used to start the machine and to select motor rotation speed and therefore cutting speed. The control lever, fitted with an ergonomic hand-grip and activation button with safety release action, reduces fatigue during operation to a minimum. The blade is protected by a guard with interlock which covers the upper area and the hand wheels and by two adjustable lower guards which protect the operator from ejected shavings and coolant. The machine is supplied with a set of service spanners.

4.3 Intended and unsuitable uses of the machine

The band sawing machine has been designed and built to cut bars, structural steel and ferrous metal pipes in accordance with the instructions contained in this manual. Therefore, the cutting of other materials is not permitted: if the above recommendations are not observed, the machine could be damaged and the health and safety of the operator put at

risk. Cutting is not permitted, if the bar has not been first locked in the vice.

5. MAIN TECHNICAL DATA

Under no circumstances should the following data be altered, this is in order to protect the correct functioning of the machine and to avoid creating safety risks for the operator.

MOTOR	Three-phase or single-phase
Motor Power	KW 0.3/0.5
Motor revolutions (two speeds)	700-1400 rpm
Electric pump	KW 0.1
BLADE SIZE(length × width × thick)	$2060 \times 20 \times 0.9$
Cutting thickness	1.2 mm
Cutting speed	80-40 rpm
Cutting angle	45° right
Piece locking vice: max opening	215 mm
Rapid clamping displacement	5 mm
Jaws height	80 mm
Jaws length	142 mm
Clamping force	350 kg – 3430 N
Bed height	935 mm
Coolant tank capacity	liters 4
Machine weight	160 kg-1570 N

6. HANDLING AND TRANSPORTATION

For safe handling and transportation use a lift truck for movement indoors also indicated on the drawing 1 Encl.1. Keep the machine in its normal position and avoid turning it upside down. If the machine is fastened to the pedestal, stability will be greatly reduced and therefore all the necessary measures should be taken to stop the machine from tipping over.

All handling and transportation operations should be carried out by trained staff.

7. MACHINE INSTALLATION

7.1 MACHINE CHECK

The machine should be checked to make sure that it has not been damaged during transportation and handling. If the machine appears to have been damaged, contact us immediately. Fit all the supplied accessories onto the machine such as the bar stop 91 (DRAW.4 ENCL.4) and the roller arm 16 (DRAW.8 ENCL.6)

7.2 FASTENING OF THE MACHINE

The machine will be able to operate in keeping with the technical parameters supplied by us, if it is positioned correctly and fastened securely to the bench or the factory floor so that vibrations are minimal during operation. Consult drawing 2 machine Installation plan

Encl.2.

7.3 BAND ASSEMBLY

Remove the bow guard 47 by unscrewing the screws 125 and the hand wheels 50 (DRAW.7 ENCL.6). Fit the band by inserting it first between the bearings of the blade guide heads and then on the two pulleys, tighten the blade slightly by means of the hand wheel 43 (DRAW.5 ENCL.5) and replace the bow guard. Check that the band is fitted with the correct direction of teeth, as shown in drawing 8 enclosed document 6. Make sure that the band type (dimensions $2060 \times 20 \times 0.9$) and its teeth pith are suited to the material to be cut.

7.4 ELECTRICAL CONNECTION TO THE MAINS

Install a differential thermomagnetic switch with characteristics suited to the mains.

Make sure that the power supply voltage corresponds to the voltage on the motor plate. Connect the cable to the power supply line observing the color codes of the individual wires, pay particular attention to the earth wire. Connect the machine, make sure that the rotation of the circular blade is in the direction shown by the arrow on the guard.

7.5 CUTTING COOLANT

For the cooling of the circular blade, fill the tank with emulsible oil obtained from a mixture of water and AGIP ULEX 260 EP oil with a percentage of 5-7%

8. MACHINE START UP AND OPERATION

8.1 DEVICES AND THEIR LOCATION

(The location of the devices described is shown on the installation plan Encl.2)

- Code 203 LOCKABLE MAIN SWITCH
- Code 55 START-STOP MICROSWITCH: situated inside the handle located at the end of the control lever and has safety release action.
- Code 77 ELECTRIC PUMP
- Code 45 CUTTING ANGLE DEVICE: to check that cutting inclination is as required
- Code 5 LOCKING VICE
- Code 91 BAR STOP
- Code 94 CONTROL LEVER WITH HANDLE

8.2 TOOLS SUPPLIED

- 1 Allen wrench size 3
- 1 Allen wrench size 5
- 1 Allen wrench size 6
- 1 Allen wrench size 8
- 1 Allen wrench size 10

8.3 OPERATION

CHECKES TO CARRY OUT BEFORE EACH CUT

A Tension the band by rotating the hand wheel 43 to the end of stroke (mechanic stop)

Remember at the end of the operation to loosen the hand wheel to avoid the slackening of the band.

- B Check that the hand indicates the required cutting angle (vice scale).
- C Make sure that the bow and the vice are locked by means of the lever 74 (DRAW.3 ENCL.4)
- D With the motor off, lower the bow and check that at the end of stroke, the band does not touch the counter-vice 4. If the band does touch, adjust the screw 72 located on the bow support 3 (DRAW.8 ENCL.6). By adjusting screw 70, the width of the working stroke can also be established.
- E Make sure that the piece to be cut is properly secured in the vice.
- F Make sure that the cooling liquid is circulating in the machine.
- G When starting the motor, make sure that the band rotates in the direction of the arrow shown in DRAW. 8 ENCL.6.

CUTTING OPERATION

- A Before cutting, check that the inclination is the one required. In order to correct or change the inclination, place the bench lever 74 in position 2 (DRAW.3 ENCL.4) and after correction, move it back to position 1.
- B To clamp the piece to be cut, bring the vice to about 3-4 mm from the piece by turning the hand wheel 93 (DRAW.3 ENCL.4). Then clamp fully by lowering lever 7 to position B (see Fig.1). Turn the speed switch 203 to the position required, take hold of the handle 67 located at the end of head lever and press the button 218. The blade will not start turning.
- C Position the blade carefully on the piece to be cut. Then increase the pressure in order to accelerate the cutting operation without using excessive force. To make a series of cuts, position the bar stop 91 in correspondence of the size required. Fix it into position by using the knob (DRAW.4 ENCL.4).
- D To replace the band, carry out the same operations used to assemble the band (chapter 7c).
- E For the choice of blade see table ENCL.1.

We strongly discourage the use of blades with ruined or insufficiently sharp cutting edges.

8.4 SPECIAL SAFETY CHECKS

- A. Before using the machine, check carefully that the safety devices are in good working order, that the mobile parts are not blocked, that no parts are damaged and that all the components are installed correctly and are functioning properly.
- B. Make sure, before operating the machine, that the screws of the guards and other protective devices are adequately secured, especially the screws of bow guard.
- C. Check that the safety microswitches and the emergency button are functioning correctly. Test them during a loadless machine cycle.
- D. Pay attention to environmental conditions. Do not expose the machine to rain; to not use it in damp environments, position the machine on a clean dry floor that has no oil or grease stains.
- E. Before using the machine, the operator should make sure that all tools and service spanners used for maintenance or adjustment have been removed.

8.5 GENERAL SAFETY RULES

- A. Wear appropriate clothing. The operator's clothing should not be loose or dangling nor should it have parts which could easily get caught. Sleeves should contain elastic. Belts, rings or chains should not be worn. Long hair should be kept in a net.
- B. Avoid unstable operating positions. Find a safe and evenly balanced position to operate the machine.
- C. Keep the work area tidy, untidiness increases the risk of accidents.
- D. Do not use the power supply cable to disconnect the plug from the socket. Protect the cable from high temperatures, oil or sharp edges. For outdoor use, only use extension cables that are in line with current regulations.

8.6 MEASURES TO PREVENT RESIDUAL RISKS

- A. The removal of guards and tampering with the safety devices is strictly forbidden.
- B. Gloves should always be worn.
- C. Standard work clothing should be used and kept closed and should not have flapping parts.
- D. The machine should not be cleaned with liquids under pressure.
- E. In the event of fire, extinguishers should not be used unless they are the powder type. The electric power supply to the machine should always be disconnected in these circumstances.
- F. Do not insert foreign bodies into the motor cover and to not supply the machine with voltage by tampering with the safety microswitches or main switch.
- G. Take the necessary precautions to avoid the machine being started by other people during loading, adjustment, piece changing or cleaning.

9. MAINTENANCE AND REPAIRS

9.1GENERAL SAFETY MEASURES

- A. Lockable main switch. Use the padlock in the event of machine failure or replacement of the band. The padlock key should be entrusted to a responsible person.
- B. Before carrying out any work on electrical equipment, remove the power supply plug from the control panel (disconnect voltage).
- C. Only use cables to supply power, which have a cross-section suited to the power of the machine.
- D. Opening key. The keys of the machine should be dept by authorized personnel. Do not leave the keys for doors which provide access to the hydraulic or electrical parts or keys to lockable switches in easy of reach of unauthorized personnel.
- E. Repairs should only be carried out by authorized personnel. Only spare parts made by the original manufacturer should be used, otherwise these could cause damage or injury.

FREQUENCY	OPERATION			
(working hours)				
100 hours	Adjustment blade guide bearings			
1000	Lubrication of mobile parts in the piece locking vice (GREASE AGIP			
	MU 2)			
50	Cleaning of the coolant tank and filter check			

9.2 ROUTINE CHECKS AND MAINTENANCE

9.3 DESCRIPTION OF ROUTINE MAINTENANCE

A. Adjustment of the blade guide bearings

Loosen the screws 110, rotate the cams 28, so that the blade guide bushings vertically position the blade in axis (DRAW.6 ENCL.5). Tighten the dowels 113 slightly until the blade secured. Loosen the dowels113 slightly (about 1/10 of a turn). The front blade guides must be positioned the nearest possible to the piece to be cut. Check every 3 months the existing tolerance between the blade guides, making sure that it does not exceed the blade thickness of one tenth of a millimeter, so as to avoid inexactnesses in the cut squaring. Periodically check with mounted blade that the blade guide bearings rotate freely.

B. Lubrication of mobile parts of piece locking vice

Remove jaw 32 (draw. 4 ENCL.4), withdraw vice 5 completely by lowering the lever 93. Clean and grease the mobile parts of the counter-vice 4 and vice 5. Lubricate the band guide devices regularly.

C. Cleaning of the coolant tank

The coolant tank can be cleaned by simply removing the crucible 13 which supports the motor-pump (DRAW.8 ENCL.6). Empty the coolant from the tank and collect the coolant in a container for future disposal. Clean away the shavings and the metallic powder, taking care not to scatter this over the machine especially around the motor and the box containing the electrical equipment. Fill the tank with the amount and liquid stated earlier.

D. Checking of bench lever functioning

Check regularly that the rotation release-locking lever is working properly. In the event of the lever not locking correctly, loosen grub screw 81(draw.3 Encl.4), tighten nut 79 and fasten grub screw 81 again. Make sure that with the bench lever in position 1, arm 3 which supports the bow, can rotate freely.

10. INFORMATION REGARDING ENVIRONMENTAL NOISE

An environmental noise test carried out on the band saw machine, identical to the machine to which these operation instructions refer, has given the following results:

ACOUSTIC RADIATION PRESSURE

- 1. LAeq=71.9 dB (A)
- 2. L_{Aeq} =87.2 dB (the maximum acceptable value is 140dB).
- 3. The level of background noise has no influence = 48.5-54.2 dB (A).

11. LIST OF SPARE PARTS

POS	DESCRIPTION	CODE	Q.	POS	DESCRIPTION	CODE	Q.
1	Base	001/31	1	33			
2	Tank	002/31	1	34	Bench lever hub 034/31		1
3	Rotating arm	003/31	1	35	Locking pin	014/31	1
4	Counter-vice	004/31	1	36	Antigrease ring	2036/31	1
5	Vice	005/31	1	37	Ring NILOS 32006	044/31	1
6	Bow	006/31	1	38	Blade tightener pin	038/31	1
7	Vice lever	007/31	1	39			
8	Motor pulley	008/31	1	40			
9	Idle pulley	009/31	1	41	Spring pin	041/31	1
10	Door	048/35	1	42			
11	Reduction unit shaft	011/31	1	43	Blade tighterner handwheel	058/35	1
12	Crucible	002-A/31	1	44			
13	Waterguard	042/31	1	45	Graduated scale	045/31	1
14	Box bracket	027/31	1	46	Blade tightener guide plate	046/32	2
15				47	Bow guard	047/31	1
16	Roller arm	016/31	1	48	Bearing 6208 2RS	073/11	1
17				49			
18	moving saw blade guide fastening washer	018/31	1	50	Handwheel D.30 M6x10	062/35	2
19	Rotating pin	019/31	1	51	Micro push plate	066/31	1
20	Vice bearing flange	021/31	1	52			
21	Vice spring	020/31	1	53	Hexagon socket grub screw M8x35 DIN914		3
22				54	Nut medium M8		3
23	Mobile blade guide rod	023/31	1	55	Handle microswitch AH715079	028/90	1
24	Fixed blade guide rod	024/31	1	56			
25	Rear blade guide	025/31	1	57	Vice gib	031/03	1
26	Front blade guide	026/31	1	58	Snap ring RS15 DIN6799		1
27	Blade guide plate	037/31	4	59	Vice screw spring spacer	085/38	1
28	Blade guide eccentric (dx-sx)	027/35	4	60	Casing AXK30 47	060/31	1
29	Rear blade guide guard	029/31	1	61	Thrust bearing AS 30 47	061/31	2
30	Front blade guide guard	030/31	1	62	Bearing 6006 2RS	062/31	2
31	Vice screw	031/31	1	63	Return spring	063/31	1
32	Vice jaw	032/31	1	64	Roller	064/31	1

POS	DESCRIPTION	CODE	Q.	POS	DESCRIPTION	CODE	Q.
65	Idle pulley spacer bearing	065/31	1	99	Screw TPSCEI M10x20 DIN	272/95	2
					7991		
66				100			
67	Handle	046/05		101			
68	Eye tie rod M10x50	043/31	1	102	Elastic pin 8x36 DIN 1481	330/95	1
69	Blade 2060x20x0.9 Z6/10	065/75	1	103	Belleville washer 40x20,4x1.5,	458/95	18
					DIN 2093		
70	Screw TE M8x35 DIN 933	216/95	1	104	Blade tightener bush	041/38	1
71	Nut M8 DIN 936	013/95	1	105			
72	Screw TE M8x35 DIN 933	216/95	2	106	Blade tightener screw	039/32	1
73	Nut M8 DIN 936	013/95	1	107	Casing AXK20 35	109/32	1
74	Bench lever	002/06		108	Thrust bearing AS 20 35	108/32	2
75	Screw TE M8x35 DIN 933	214/95	2	109			
76	Тар	042/05	1	110	Screw TE M8x55 DIN 933	218/95	2
77	Moter pump	090/90	1	111			
78	Screw TE M12x40 DIN 933	242/95	2	112			
79	Bench lever nut	024/03	1	113	Hex. socket grub screw M6x10	048/95	2
					DIN913		
80	Screw TPSCEI M8x16 DIN	251/95	2	114	Bearing 608 2RS	055/35	4
	7991						
81	Hex. Socket grub screw M6x10	081/95	1	115	Screw TCEI M6x8 DIN 912	135/95	2
	DIN914						
82				116			
83	Hex. Socket grub screw M8x10	085/95	1	117	WasherxM8 DIN 125/A	004/95	4
	DIN914						
84				118			
85	Screw TPSCEI M8x16 DIN	260/95	1	119	M12x30 spring return lever	044/09	1
	7991						
86	Washer as per drawing	053/31	1	120	Reducation	190/80	1
87				121	Screw TE M8x25 DIN 933	214/95	4
88	Counter-vice pin	050/31	1	122	Screw TCEI M8x25 DIN 912	158/95	4
89	Nut M16 DIN 936	025/95	1	123	Ring-nut M30x1.5 DIN 981	304/95	1
90	Bar stopping rod	031/05	1	124	Bearing 32006	071/20	2
91	Stopping rod	004/05	1	125	Screw TBEI M6x8 ISO 7380	282/95	2
92	Handwheel D.40 M8x25	077/25	2	126	Microswitch E 100 001S51	030/90	1
93	Vice handwheel	056/35	1	127			
94	Knob rod	035/32	1	128	Motor	156/80	1
95				129			
96	Screw TPSCEI M8x16 DIN 912	155/95	6	130	Screw TCEI M8x25 DIN 912	158/95	4
97	Washer as per drawing	067/31	2	131	Hex. socket grub screw M6x10	048/95	8
					DIN913		
98							

POS	DESCRIPTION	CODE	Q.	POS	DESCRIPTION	CODE	Q.
200	Box	066/90	1	210	Remote contr. Switch	032/90	1
					CGE MC0A310AT1		
201	Panel	069/90	1	211	Thermal relay CGE	053/90	1
					MT03		
202	Omega raceway	046/90	1	212	Fitting for cables PG9	213/90	1
203	Changeover switch	012/90	1	213	Socket head screw		2
	VEMERCSO121177IPA				M4x8		
204	Screw TCCC M4x14 DIN	295/95	4	214	Screw TCCC M4x14	295/95	4
	7981				DIN 7981		
205	Screw TCEI M4x6 DIN 912	120/95	3	215	Fuse blok PCH 1x38	093/90	1
					FU2		
206	Fuse carrier PCH 2x38 FU1	094/90	1	216	Fuse blok PCH 2x38	094/90	1
					FU3		
207	Contact emergency button			217	Transformer 20 VA	042/90	1
208	Emergency button	085/90	1	218	Handle button		1
209	Fitting for cables PG 13.5	215/90	2	219	Cover box	067/90	1
				220	Electrical cable	016/77	1
				221	Screw TCCC M4x14	295/95	6
					DIN 7981		
				222	Screw TPSCEI M6x10	249/95	2
					DIN 7991		
	Parts not visible on exploded						
	view						
	Tool set N° 4KM 0106/4	004/73	1				
	Fuse 10x38 1A	202/90	4				
	Fuse 10x38 2A	203/90	1				

12. LAYING OFF AND DISMANTLING

12.1 LAYING OFF

If the machine is to be laid off or left idle for a long period, the following operations must be carried out:

- 1. Disconnect the machine from the electricity mains.
- 2. Empty oil from the gear box and cooling liquid from its tank.
- 3. Clean carefully the machine by getting rid of all traces of grease, especially on the worked parts that must be protected with anti-oxidants.

- 4. Cover the machine with a sheet, preferably not plastic as it can cause rust due to the humidity condensation.
- 5. Store the machine in a closed, dust-free place.

12.2 DISMANTLING

If the machine must be definitively dismantled, its components must be sub-divided for the purpose of a possible recycle of the materials and for the environment safety. The following table is given for your guidance:

steel	Light alloy	Cast iron	Bronze copper	plastic	various
bolts	cylinders	Structural	Motor winding		
		parts			
springs				seals	
flanges	Gear boxes			Flexible pipes	
				gaskets	
Pins, pivots			bushings		friction items

Used oil and materials must be disposed of according to 75/439/EEC and 87/101/EEC Directives and to country specific regulations.

CAPACITA' DI TAGLIO BAND SAW 215 CAPACITA' DI TAGLIO -CUTTING CAPACITY - CAPACITE DE COUPE SCHNITTKAPAZITAET - CAPACIDAD DE CORTE ۲ 90° 150 150 200 x 120 . 90 130 x 90 45° Destra - right - droite - rechts 120 SCELTA DELLA LAMA a the SCELTA DELLA LAMA - Zx1" : - Zx1" Zx1' SELECTION OF BLADE CHOIX DE LA LAME L mm. WAHL DES SAEGEBLATTS SELECCION DE LA HOJA L 6/10 ≦40 -8 . >30<80 6 5/8 >60<90 4 4/6 З 3/4 ≧100 Zx1* Zx1 Zx1' S mm. S 1 ≦1,5 14 -10 10/14 >1<2 S 8/12 >2<4 8 6/10 >4<8 6 S 5/8 >6<12 6 ≧12 4 4/6

ALLEGATO -1-

velocità di taglio a macchina è dotata di due velocità di tag	io 80-40 m/1'
utting machine	
be machine is equipped with two cutting	needs 80-40 m/1'
litesse de course	*
a machine est datée de deux vitesses de	coupe 80-40 m/1'
a machine est doitee de deux vitesses de	
in Manahina ist mit zwei Schnittasschwin	lickeiten ausgetattet 80-40 m/1'
Me Maschine Ist Thit zwei Schnittgeschwir	igkeiten ausgelattet
a maquina esta dotata de dos velocidade	s de corte 80-40 m/1'
a maquina esta dotata de dos velocidade	
Nateriale	Velocità di taglio m/1'
Material .	Cutting speed m/1'
Materiel	Vitesse de coupe m/1'
Material	Schnittgeschwindigkeit m/1'
Aterial	Velocidad de corte m/1'
	Pieni
	Solid
	Pleins 80
Coisi da costruzione	e42 Volles Material
	a/2 Dies
Structural steel Fe3/+	042
Aciers de construction Fe37+	
Baustahl Fe37+F	e42 Promati
Acero de construccion Fe37+F	e42 Structural steel
	Profilés 80
	Profile
	Perfiles
Acciai da costruzione Fe50+I	e70
Structural steel Fe50+1	e70
Aciero de construction Ee50+1	80
	270
Baustahl Fe50+1	
Acero de construccion . Fe50+i	e70
Acciai al carbonio C40+C	50
Carbon steel C40+C	60
Aciers au carbone C40+C	80 80
Kohlenstoffstahl C40+C	50
Acero al carbono C40+C	50
Acciai legati	
Alloved steel	
Aciors alliá	40
Acters alle	
Accial mox	
Stainless steel	40
Aciers inoxydables	TU
Rostfreier Stahl	
Acero inoxidable	
Ghisa grigia	
Grey cast iron	00
Fonte grise	00
Grauouß	
Fundición aris	
Leghe d'alluminio	
Aluminium allove	
	80
Alliges d'aluminium	00
Legierungen aus Aluminium	
Aleación de aluminio	
Bronzi	
Bronze	
Bronze	08
Bronze	



















