



HAND HACK SAW BLADES

ALO 600-15-1

CUT TO LENGTH MACHINE FOR HAND HACK SAWS

ALO 681

SETTING MACHINE FOR HAND HACK SAWS

ALO 690-81

SETTING AND FLEX HARDENING OF HSS HAND HACK SAW BLADES

ALO 690-81 COMBI

SETTING AND FLEX HARDENING OF ABCIII/CARBON HAND HACK SAW BLADES

ALO 695-60

SETTING AND FLEX HARDENING OF LOW ALLOY STEEL HAND HACK SAW BLADES

ALO 695-81

SETTING AND FLEX HARDENING OF LOW ALLOY STEEL HAND HACK SAW BLADES

HS 12

AUTOMATIC HAND HACK SAW BLADE GRINDING MACHINE

ALO 600-15-1

Cut to length machine for hand hacksaw blades



THE SYSTEM COMPRISES:

Payoff coiler
Coil straightening unit
Feed and punch unit
Collector magazine

CAPACITY:

Blade width: 10 - 15 mm
Blade thickness: 0.5 - 0.7 mm
Max feed length: 320 mm
Speed example: 60 blades/min

OPTIONS / ACCESSORIES:



ALO 822
Double coiler



ALO 90915
Expandable centre with
auto band lock



ALO 106 CUBE
Coil handling system



The feeding system with clamping jaws on each side.



Picture showing compact toggle joint and collect magazine.

MACHINE DESCRIPTION

The band is fed from a powered decoiler through a straightening device to the feeding unit.

The blade length is measured in one feed cycle and the blade is locked with a double clamping system during the punch operation and the return stroke of the feed unit.

The compact toggle joint press is made of tool steel and equipped with linear ball guides and needle bearings to ensure long lifetime

At the punching operation the end of the blades and the holes are formed with hard metal insert dies that easily can be dismantled for regrinding or exchange.

Number of blades are programmed at the operator panel and the surveillance of the machine is done via a PLC.

The machine is equipped with a screw collect magazine that will stack the blades vertically.

The machine can cut bands with or without teeth.

Options

Double coilers (No. 820-2)

Machine for larger and thicker bands on request,

Induction generator when cutting hard blades/bands.

A 3 kW induction generator will heat the cutting zone to required temperature. When using the generator the cutting speed may be slightly reduced.

TECHNICAL SPECIFICATION:

Band width:	10 - 15 mm
Band thickness:	0.5 - 0.7 mm
Max feed length:	320 mm
Length feed accuracy:	±0.1 mm
Max coil OD:	820 mm
Max coil ID:	300 - 315 mm
Max coil weight:	150 kg
Weight:	450 Kg
Approx capacity:	60 blades / min (see options)
Air pressure:	6.3 bar
Voltage:	230 VAC, ± 10%, 1-phase, 50 – 60 Hz ± 1% directly earthed system
Power consumption (at max output power):	0.2 kVA
Space requirement (l x w x h):	3.3 x 1.6 x 1.1 m

Other customer requirements may be discussed between customer and ALO.



ALO 681

Setting machine for hand hacksaw blades



THE SYSTEM COMPRISES:

Setting unit
Feed magazine
Collector magazine

CAPACITY:

Blade length: 250 - 315 mm
Blade width: 10 - 25 mm
Blade thickness: 0 - 1.5 mm
Tooth pitch: 2 - 32 tpi
Setting tolerance: ± 0.02 mm
Symmetry tolerance: ± 0.02 mm
Capacity: 20 - 30 blades / min

OPTIONS / ACCESSORIES:



ALO 81-60
Set gauge



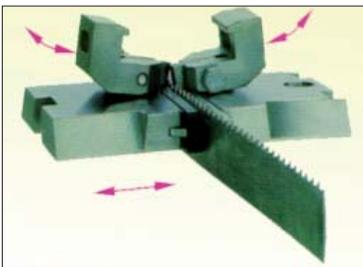
ALO 61201
Grinding fixture



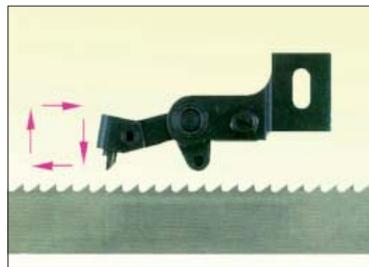
Feed magazine will separate and feed one blade at a time to the setting unit.



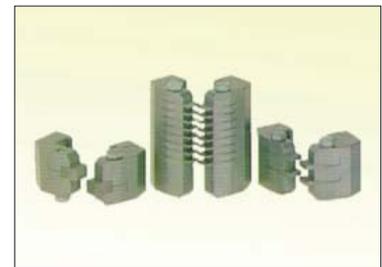
Feed and screw collector magazine will stack up to 700 blades.



The oscillary motion of and angle on the setting tools result in minimal damage on the sawblade teeth. The clamping jaws hold the blade firmly during the setting operation.



Due to self lifting system the feed pawl will not damage the tooth tip during the return stroke.



Standard setting tools for 3/4 - 32 regular tpi. as well as custom made vary pitch tools available.

MACHINE DESCRIPTION

This setting machine is fully automatic and all functions are controlled by a programmable controller. The in feed magazine, separates and feeds one blade at a time to the setting unit. The whole length of the blade may be set, or portions at each end may be left unset.

Setting symmetry and over all set is easy to adjust with micrometers. During the setting operation the blade is clamped by clamping jaws to make it possible for the oscillatory moving setting tools to set the teeth to perfection. Control panel allowing machine to be operated in manual, auto and step by step mode. The setting speed is variable by use of a thyristor control.

With custom made setting tools the machine will set all known tooth forms and setting patterns with a repeated pattern within a length of 75 mm or less.

After the setting operation the blade will be transported out to a screw collect magazine. Both infeed and collect magazine takes approx. 700 blades.

TECHNICAL SPECIFICATION:

Blade width:	10 - 25 mm
Blade thickness:	0 - 1.5 mm
Tooth pitch:*	2 - 32 tpi
Setting tolerance:	±0.02 mm
Symmetry tolerance:	±0.02 mm
Max. feed length:	80 mm. See remarks.
Capacity:	20 - 30 blades / min
Approx. magazines capacity:	700 blades.
Air pressure:	6.3 bar
Power consumption (normal):	0.5 kVA
Voltage:	230 VAC ±10 %, 1-phase, 50-60 Hz ±1%, directly earthed system
Weight:	400 kg
Space requirement (l x w x h):	1.8 x 1.3 x 1.45 m

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ALO Center AB
Industrivägen 10
SE-792 32 Mora Sweden
+46 250 94900
info@alocenter.se
www.alocenter.se



ALO 690-81

ALO 690-81

Setting and Induction flex hardening of HSS hand hacksaw blades



CAPACITY:

Blade length: 250 - 320 mm
Blade width: 12 - 13 mm
Band thickness: 0.5 - 0.7 mm
Tooth pitch: 14 - 32 TPI
Production speed: 18-24 blades / min

THE SYSTEM COMPRISES:

Pay off magazine
Setting machine type ALO 681-S
Hardening generator and inductor
Closed cooling system
Collect magazine

OPTIONS / ACCESSORIES:



ALO 81-60
Set gauge

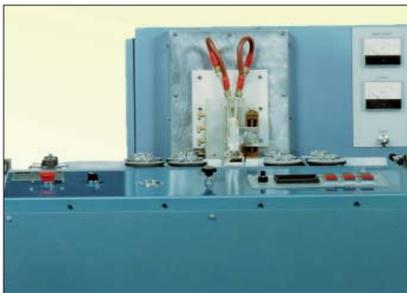


ALO 61201
Grinding fixture





Setting unit



Hardening unit



Collect magazine

MACHINE DESCRIPTION

Blade feed unit

The blades are fed from the feed magazine containing approx. 700 blades into the setting machine where they are accurately set, either wavy or raker acc. to choice. After setting, they are fed into the blade feed unit by means of an air motor. Two pairs of ceramic rollers driven by a servo motor feeds the blades into the work coil, where they are accurately guided by means of a ceramic guide system. In the work coil the teeth and the back edge are hardened and the rest remains soft, thus giving a very flexible blade.

The blades are air quenched and transported out of the work coil by means of two pairs of ceramic rollers. A 5th set of rollers feeds the blades into the pay off magazine. All the rollers and guides are manufactured from a suitable ceramic material to give positive drive.

ALO 681-S setting machine

The setting machine is fully automatic and all functions are controlled by a programmable controller. The feed magazine will feed one blade at a time to the setting unit. Portions at each end of the blades may be left unset.

Setting symmetry and over all set is easy to adjust with micrometers.

During the setting operation, the blade is clamped hard to make it possible for the oscillatory moving setting tools to set the teeth to perfection in both raker and wavy set patterns.

Collect magazine

The magazine consists of a pair of screw feeders and a stacking magazine. The blades drop down to the screw feeder which transports the blades into the magazine where they are vertically stacked.

TECHNICAL SPECIFICATION:

Blade length:	250 - 320 mm
Blade width:	12 - 13 mm
Blade thickness:	0.5 - 0.7 mm
Tooth pitch:	14 - 32 TPI
Setting tolerance:	0.02 mm
Approx. setting / hardening speed:	18-24 blades / min
Approx magazine capacity:	700 blades
Air pressure:	6.3 bar
Standard voltage:	400VAC \pm 10% 3-phase, 50-60 Hz \pm 1% directly earthed system, other voltages available upon request.
Power consumption (at max output power):	25 kVA
Blade steel grade:	ABC3, M2 or E945
Other customer requirements may be discussed between customer and ALO	

ALO 690-81 Combi

Setting and Induction flex hardening of ABCIII hand hack saw
Setting and induction hardening of carbon hand hack saw



CAPACITY:

Blade length:	250 - 320 mm
Blade width:	12 - 13 mm
Band thickness:	0.5 - 0.7 mm
Tooth pitch:	14 - 32 TPI
Production speed:	18-24 blades / min

THE SYSTEM COMPRISES:

Pay off magazine
Setting machine type ALO 681 - S
Hardening generator and inductor
Closed cooling system
Collect magazine

OPTIONS / ACCESSORIES:



ALO 81-60
Set gauge

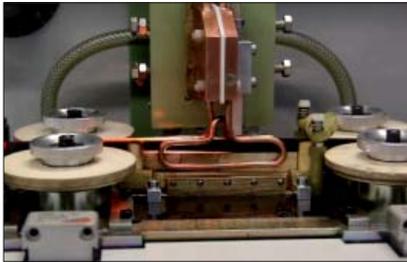


ALO 61201
Grinding fixture

MACHINE DESCRIPTION

ALO 681-S setting machine

The blades are fed from the feed magazine containing approx. 700 blades. The setting machine is fully automatic and all functions are controlled by a PLC. The feed magazine will feed one blade at a time to the setting unit where they are accurately set. Portions at each end of the blades may be left unset. Setting symmetry and over all set is easy to adjust with micrometers. During set operation, the blade is clamped hard to ensure a very accurately set result both for raker and wavy set patterns.

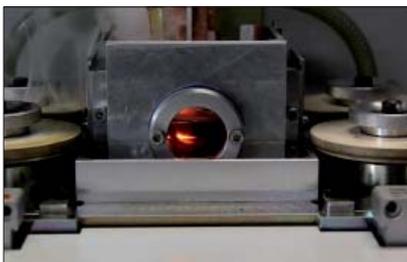


ABCIII blade hardening

ABCIII material

Two pairs of ceramic rollers driven by a servo motor feeds the blades into the work coil, where they are accurately guided by means of a ceramic guide system. In the work coil the teeth and the back edge are hardened and the rest remains soft, thus giving a very flexible blade.

The blades are air quenched and transported out of the work coil by means of two pairs of ceramic rollers.



Carbon blade hardening with inductor immersed in quench oil tank

Carbon blades

the work coil, which is placed in a quench chamber and immersed in the quenching medium, is made of round copper tubing and is designed to simultaneously heat the teeth and the back of the blade. It is adjustable in height to permit optimisation of the heat pattern. The work coil is interchangeable and can easily be replaced.

To change set up between ABCIII and Carbon configuration is done easily by change of inductor and guide or quench chamber.



Collect magazine

Collect magazine

The magazine consists of a pair of screw feeders and a stacking magazine. The blades drop down to the screw feeder which transports the blades into the magazine where they are vertically stacked.

TECHNICAL SPECIFICATION:

Blade length:	250 - 320 mm
Blade width:	12 - 13 mm
Blade thickness:	0.5 - 0.7 mm
Tooth pitch:	14 - 32 TPI
Setting tolerance:	0.02 mm
Approx. setting / hardening speed:	18-24 blades / min
Approx magazine capacity:	700 blades
Air pressure:	6.3 bar
Standard voltage:	400VAC \pm 10% 3-phase, 50-60 Hz \pm 1% directly earthed system, other voltages available upon request.
Power consumption (at max output power):	32 kVA
Blade steel grade:	ABCIII, M2 or E945

Other customer requirements may be discussed between customer and ALO



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ALO Center AB
Industrivägen 10
SE-792 32 Mora Sweden
+46 250 94900
info@alocenter.se
www.alocenter.se



ALO 695-60

ALO 695-60

Setting and induction flex hardening of low alloy steel hand hacksaw blades



CAPACITY:

Blade length: 250 - 320 mm
Blade width: 12 - 13 mm
Band thickness: 0.5 - 0.7 mm
Tooth pitch: 14 - 32 TPI
Production speed: 60 blades / min

THE SYSTEM COMPRISES:

Pay off magazine
Setting unit
Feed unit
Hardening generator and inductor
Closed coolant system
Closed quench system





Pay off magazine with roller setter



Feed unit, hadening coil and quenchant chamber

MACHINE DESCRIPTION

Blade feed unit

The blades are fed from the pay off magazine, containing approx. 700 blades, to the roller setting machine where they are wavy set by two setting rolls. The rolls are adjustable in unison for overall set. Setting speed are controlled by a potentiometer and a frequency controller. The blades are fed into the feed unit by means of an air motor. Two pairs of feed rollers feed the blades into the inductor, placed in a quenchant chamber and immersed in the quenching medium.

In the inductor the teeth and the back edge are hardened and the rest remains soft, thus giving a very flexible blade. The blades are transported out of the inductor by means of two pairs of feed rollers. A 5th set of rollers removes the blades from the feeder and into a collect bin or similar.

Generator

The generator is enclosed in an aluminium cabinet. The two sides of the generator are fitted with removable panels with special locks.

Controls, instruments and the HF output terminal are placed on the front of the generator, water and main connections on the opposite side. The output power is continuously controllable between 10 and 100%. The integral capacitor battery consists of 2 water cooled capacitors and can be regulated so as to be suitable for heat treatment of both magnetic and non-magnetic material. A maximum current breaker protects the generator in the event of a short circuit or overload.

Inductor

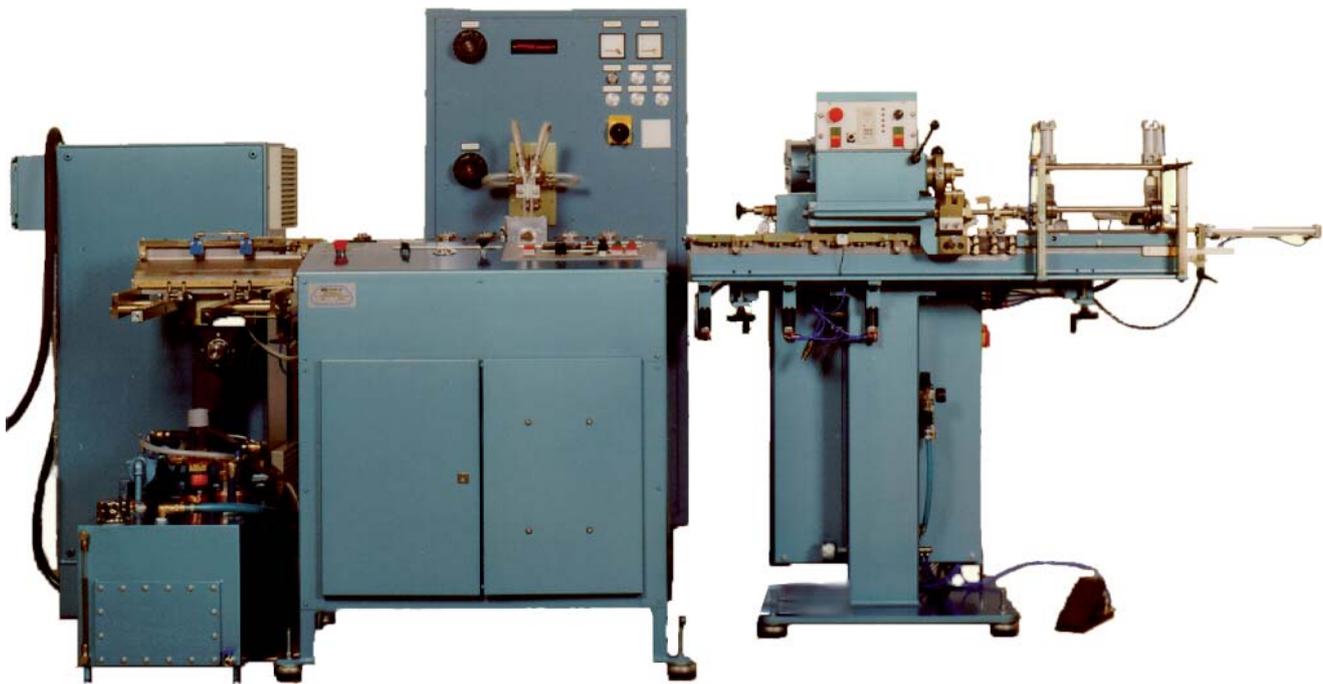
The inductor is made of round copper tubing and is designed to simultaneously heat the teeth and the back of the blade. It is adjustable in height to permit optimization of the heat pattern. The inductor is interchangeable and can easily be replaced.

TECHNICAL SPECIFICATION:

Blade length:	250 - 320mm
Blade width:	12 - 13mm
Band thickness:	0.5 - 0.7mm
Tooth pitch:	14 - 32 TPI
Capacity:	60 blades / min
Blade steel grade:	Carbon and low alloy steel
Air pressure:	6.3 bar
Standard voltage:	400VAC \pm 10% 3-phase, 50-60 Hz \pm 1% directly earthed system, other voltages available upon request.
Max output power hardening generator:	15 kW
Power consumption (at max output power):	30 kVA

ALO 695-81

Setting and hardening of low alloy steel hand hacksaw blades



CAPACITY:

Blade length: 250 - 320 mm
Blade width: 12 - 13 mm
Band thickness: 0.5 - 0.7 mm
Tooth pitch: 14 - 32 TPI
Production speed: 25 blades / min

THE SYSTEM COMPRISES:

Pay off magazine
Setting machine type ALO 681 - S
Hardening generator and inductor
Closed cooling system
Quench and recirculation system.
Collect magazine

OPTIONS / ACCESSORIES:



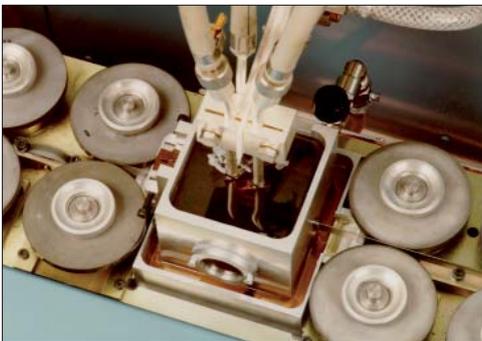
ALO 81-60
Set gauge



ALO 61201
Grinding fixture



Blade feed unit



Hardening work coil

MACHINE DESCRIPTION

Blade feed unit

The blades are fed from the feed magazine containing approx. 700 blades into the setting machine where they are accurately set, either wavy or raker acc. to choice. After setting, they are fed into the blade feed unit by means of an air motor. Two pairs of ceramic rollers driven by a servo motor feeds the blades into the work coil, which is placed in a quenchant chamber and immersed in the quenching medium. In the work coil the teeth and the back edge are hardened and the rest remains soft, this giving a very flexible blade. The blades are transported out of the work coil by means of two pairs of ceramic rollers. A 5th set of rollers feeds the blades into the pay off magazine. All the rollers and guides are manufactured from a suitable ceramic material to give positive drive.

ALO 681-S setting machine

The setting machine is fully automatic and all functions are controlled by a programmable controller. The feed magazine will feed one blade at a time to the setting unit. Portions at each end of the blades may be left unset. Setting symmetry and over all set is easy to adjust with micrometers. During the setting operation, the blade is clamped to make it possible for the oscillatory moving setting tools to set the teeth to perfection in both raker and wavy set patterns.

Collect magazine

The magazine consists of a pair of screw feeders and a stacking magazine. The blades drop down to the screw feeder which transports the blades into the magazine where they are vertically stacked.

TECHNICAL SPECIFICATION:

Blade length:	250 - 320 mm
Blade width:	12 - 13 mm
Blade thickness:	0.5 - 0.7 mm
Tooth pitch:	14 - 32 TPI
Setting tolerance:	0.02 mm
Approx. setting / hardening speed:	25 blades / min
Approx magazine capacity:	700 blades
Air pressure:	6.3 bar
Standard voltage:	400VAC \pm 10% 3-phase, 50-60 Hz \pm 1% directly earthed system, other voltages available upon request.
Power consumption (at max output power):	30 kVA
Blade steel grade:	Carbon and low alloy steel
Space requirement (LxWxH)	2.5 x 1.5 m

Other customer requirements may be discussed between customer and ALO

NORMAC HS 12

Automatic hand hack saw blade grinding machine



EXCLUSIVE FEATURES HS12 AUTOMATIC HAND HACK SAW BLADE GRINDING MACHINE

- Grinds positive rake tooth forms as well as conventional tooth forms.
- Produces sharper teeth, improved finish and uniform teeth with little or no burr.
- Eliminates the need to regrind milling cutters.
- Convenient, easy cassette loading system.
- Wheel and dresser slides are heavy cast iron, hardened and ground, and automatically lubricated for greatest durability.
- Fully automatic, self-compensating rotary diamond roll dressing system.
- Fully enclosed grinding chamber for clean, quiet operation.

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NORMAC, Inc. / Precision Grinding Machines



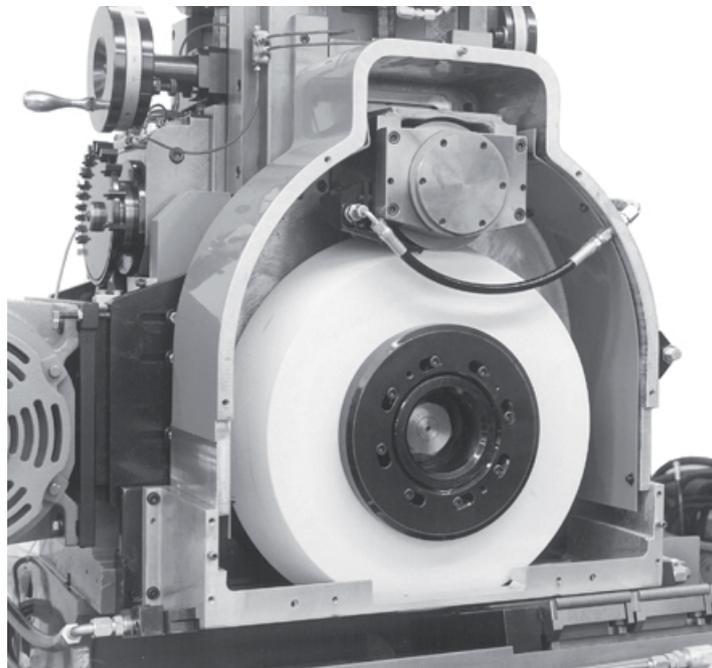
MACHINE DESCRIPTION

One of the most prevalent methods of producing hand hack saw blades is the milling method.

Although widely used, there are some inherent problems in the milling process, such as availability of milling cutters from varied sources and the re-sharpening of dull and worn cutters.

With the HS12 Automatic Hand Hack Saw Blade Grinding Machine, Normac has proven the superiority of grinding over milling for hand hack saw blade production. The HS12 eliminates milling problems by incorporating innovative features such as a precision grinding wheelhead assembly, extremely accurate needle bearing slideways, automatic self-compensating dresser system and quick, easy setup and operation.

The result is the finest blades possible; blades that have sharper more uniform teeth, little or no burr, no bent teeth due to cutting forces on the blade, and tooth size and shape that are uniform lot to lot.



TECHNICAL SPECIFICATION:

Blade Sizes	0,56 mm - 0,65 mm (.022" to .025") thick, 13 mm (.50") wide, 250 mm (10") or 300 mm (12") long. Carbon steel, High speed steel or Bimetal.
Estimated Production Rate:	3,000 to 4,000 blades per hour average.
Grinding Wheel Size:	500 mm (20") O.D. x 203,2 mm (8") I.D. x 100 mm (4") wide., 15° face angle. Vitrified bonded type.
Coolant Requirement:	190 L.P.M. @ 8 atmospheres (50 G.P.M. @ 120 P.S.I.). Note: Coolant system not furnished with the machine.
Electrical Requirement:	230, 380, 415, 460 OR 575 V.A.C. 50 or 60 Hz, 3 phase, 37 Kw.
Floor Space:	1,8 m x 1,9 m (72" x 78").
Shipping Weight:	3720 kg (8,200 lbs.)