

# JD Basic COMPACT working manual

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## 1. Preface

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JD Basic COMPACT according to EN 438.4, 6. and 7. are an excellent material for indoor and outdoor surfaces. They can be used as self-supporting compact sheets. JD Basic COMPACT meet the stringent requirements for hygiene, fire resistance, humidity resistance and mechanical properties. JD Basic COMPACT are available in a variety of colors, patterns and surface textures, providing extensive options for entrepreneurs, architects and designers. JD Basic COMPACT surfaces are hard and resistant to wear, impact and scratching, making them long lasting, easy to clean and largely resistant to vandalism and graffiti.

In addition to their physical properties, JD Basic COMPACT offer other benefits including quick and easy installation of compact laminate panels, and in renovation applications using dry construction methods, elimination of the need to remove existing wall coverings such as wallpaper, textile coverings, or ceramic tiles. This technical leaflet contains general recommendations for the processing and handling of JD Basic COMPACT. In addition to this leaflet there are a number of other documents which provide detailed information about the topics described. This bulletin is intended as an overview for professionals working in the JD Basic COMPACT industry.

The leaflet represents the state of knowledge as of January 2018.

## 2. General composition and advices

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JD Basic COMPACT are composed of paper layers which are impregnated with synthetic resins and fused together under elevated temperature and high pressure. The laminate structure contains a number of core paper layers typically impregnated with phenolic resin, with the number varying depending on the laminate thickness, and a surface layer typically consisting of a decorative paper impregnated with melamine resin. Printed decorative paper may also include a clear overlay paper to enhance abrasion resistance.

As a general recommendation only tools for hardwood processing are recommended, and even only sharp tools with diamondlayer and calm speed, in case a special high working standard is required.

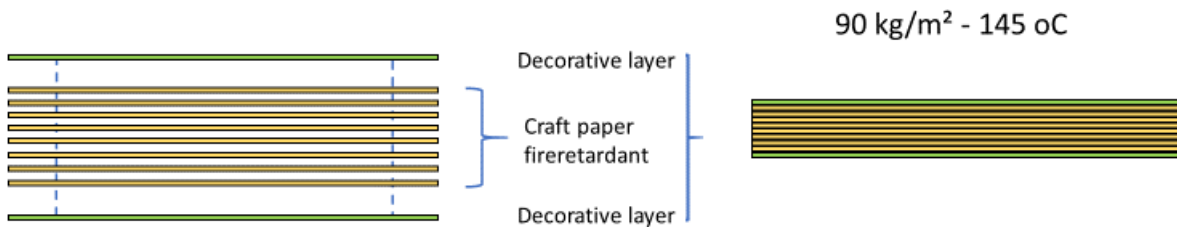
Chipping or decorative parts jumping from the edges are indications that tools are not sufficiently strong/sharp or wrong usage.

## 2.1 Structure of JD Basic COMPACT

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The typical structure of JD Basic COMPACT is:

### JD Basic COMPACT



## 2.2 JD Basic COMPACT and EN-438

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JD Basic COMPACT are grouped into the following types according to EN 438:

### 2.2.1 Type CGS (Compact Grade Standard) EN-438.4

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The characteristic properties of this interior grade are hard, virtually wear and scratch proof surfaces, high resistance to impact, insensitivity to boiling water and a number of typical household chemicals, as well as a pronounced resistance to dry and humid heat.

### 2.2.2 Type CGF (Compact Grade Fire-retardant) EN-438.4

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The properties of this grade are generally equivalent to type CGS, but feature increased resistance to fire. Note: National and international fire regulations must be followed.

## 3. Security instructions

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Before handling or processing JD Basic COMPACT please assure that all needed security instructions are followed, by using working cloth, security shoes, hair net, gloves, protection glasses, ear cover, dust protection etc. In any case those are only recommendations, please always follow the local regulations on site.

Gloves are necessary when handling JD Basic COMPACT sheets in raw size or recently clean cut, due to sharp edges.

Protective glasses will prevent that dust or particles from the processing will impact on the eyes.

Dust protection is recommended as when cutting woodbased panels, to secure a regular breathing.

Ear protection is recommended since while processing JD Basic COMPACT, the noise can exceed 80dB.

## 4. Storage, cleaning and handling

### 4.1 Storage

JD Basic COMPACT should be stored so they are protected from moisture, humidity and direct sunlight. JD Basic COMPACT are to be kept in a closed warehouse with normal conditions 18 to 25 °C and 50 to 65 % relative humidity. JD BASIC COMPACT should be stored in stacks horizontally with all edges being in line on an even support which is covered with a plastic film on top, bottom and all 4 sides. On top of the stack is to be covered with a protection board (Figure 3 and 4). It should be avoided to have different climatic exposure to both sides of the JD Basic XTEROIR (COMPACT) sheets. Acclimatization for min. 72 hours before machining. This is also the case when JD Basic COMPACT sheets are preinstalled on subconstructions and/or with hinges for invisible installation. In such case use wooden batterns or similar must be used between the sheets.

Storage: at 18 to 25 oC – 50 to 65% relative humidity

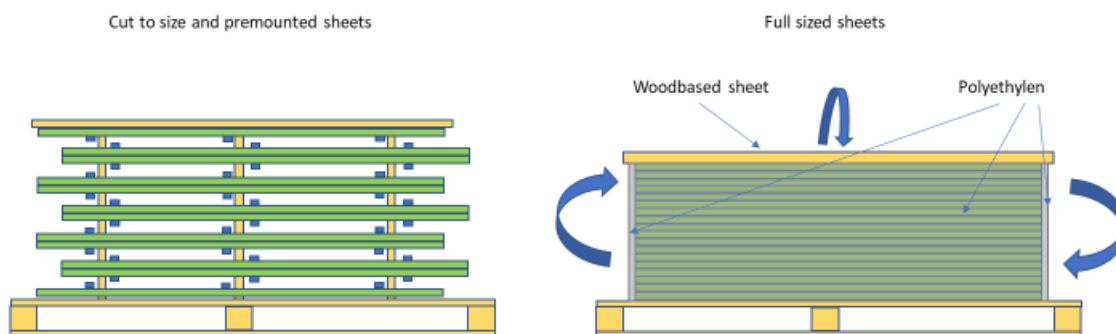


Figure 1: Correct storage

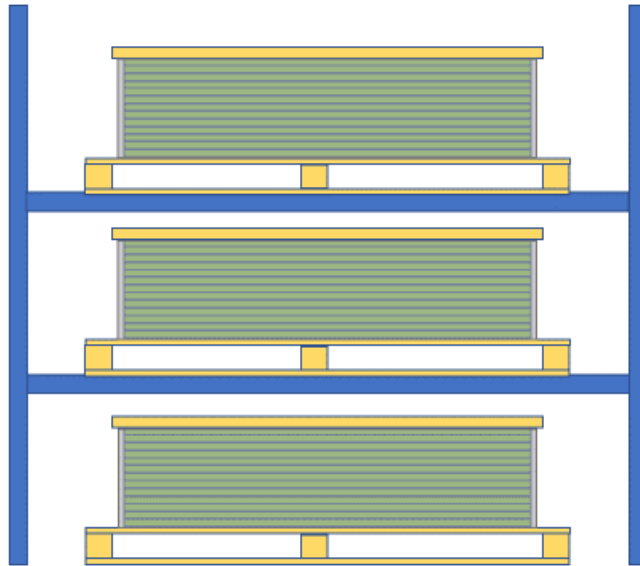


Figure 2: Correct storage of JD Basic COMPACT sheets in shelves

## 4.2 Intermediate cleaning

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Please note that foreign substances (such as drilling and machine oils, greases, adhesive residues, sunscreen creams, etc.), which are getting onto the JD Basic COMPACT sheets during storage, assembly and installation, are to be removed immediately and completely. The panels must not come into contact with sunscreen during installation, as even with immediate cleaning a complete cleaning is not ensured. Failure to comply will result in no complaints regarding color, gloss and finish accepted / recognized. Details on how to properly clean the JD XTERIOR (COMPACT) sheets, please see separate folder for special cleaning of JD Basic XETRIOR (COMPACT) sheets. In general use a dry cloth (never scouring pads) eventually with some liquid cleaner without scouring particles and containing acid. Hot water for instance. Please also see chapter 97.

After opening the stack for use, it is recommended that the stack shall be covered again with protective film in order to protect the sheets.

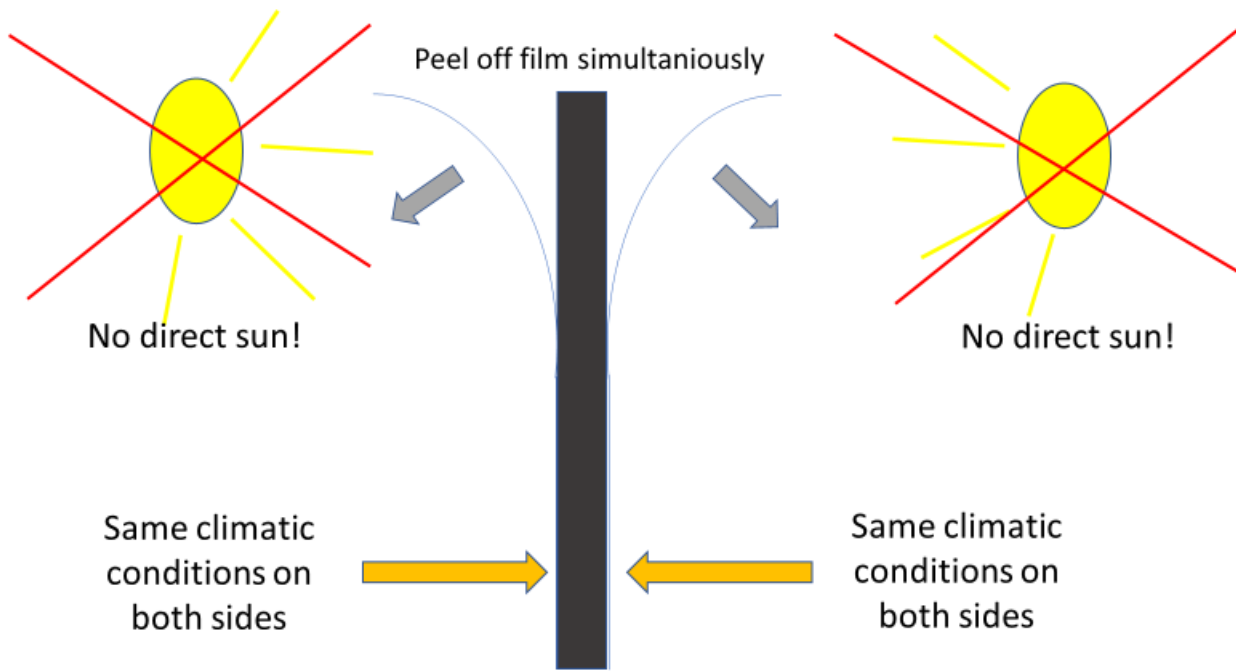


Figure 3: Removing of protective film

If JD Basic COMPACT are not stored flat, warpage can occur. If boards are equipped with an adhesive protection film, films must be removed from both sides simultaneously to prevent warpage. Please avoid different climatic impacts on both sides.

### 4.3 Handling & Transport

Lift the JD Basic COMPACT sheets horizontally from the stack. Never slide them away, which may lead to scratches.

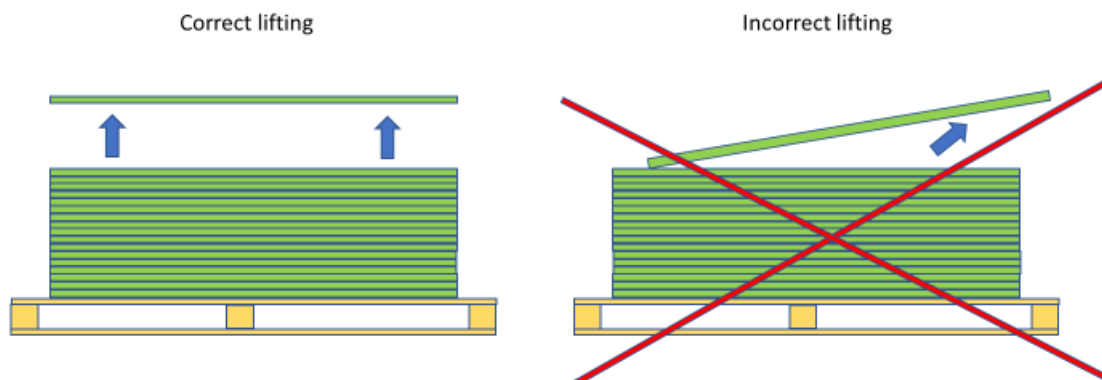


Figure 4: Correct lifting



When transporting stacks of laminates, solid pallets of sufficient size shall be used. The laminates must be securely fixed to avoid sliding. Any particles between the panels, due to the heavy load weight, may easily lead to surface damage, which must be avoided. When stacking or unstacking laminates, the boards must not be pushed or drawn over the edge, but have to be lifted either by hand or a panel lifter. When moving stacked sheets with transport vehicles, large and sturdy pallets should be used, with the stacked sheets secured to prevent sliding.

Protective film must be removed at the same time from both sides to avoid warping. Depending on the duration of stocking time, the protective film may become more durable to remove. This has nothing to do with the quality of the JD Basic COMPACT sheets, and consequently this is no reason for any complaint nor compensation. Never exploit the JD Basic COMPACT sheets to heat or direct sunlight. This may lead to sticking of the protective film onto the sheets.

During handling and fabrication, it is important to follow the local rules of working force protection in form of helmets, security shoes etc. Please also be aware that JD Basic COMPACT sheet edges, even if industrial cut, are very sharp for which reason protection gloved are strongly recommended.

During handling and fabrication, the JD Basic COMPACT sheets are to be kept flat, full faced stored and covered and protected by a wood based top and bottom sheet as well as covered by polyethylene. The same is valid for cut-to-size pieces. Wrong storage can lead to deformation and irreparable warping of the sheets.



Figure 5: Correct handling, storing and transportation of JD Basic COMPACT

## 5. Machining JD Basic COMPACT

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Before machining JD Basic COMPACT sheets, please always contact your local machine equipment supplier and tool supplier for exact advices. The following general advices can be given:

## 5.1 General information

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JD Basic COMPACT can be processed with woodworking machines.

When planning an application using JD Basic COMPACT it should be considered that laminates react to climatic changes by minor expanding or shrinking (< 2,5 mm/m). The dimensional change in cross direction is approximately double of that in machine direction.

The jointing of JD Basic COMPACT can be done by well-known methods like profiling, groove and tongue or screwing. The use of non-corrosive fastenings is highly recommended.

When jointing boards by gluing, it has to be taken care of that dimensional changes caused by climatic changes will not be hindered. The choice of glue is dependent on the expected stress on the element, contact the adhesive supplier for recommendations.

If fixing JD Basic COMPACT to a substrate it has to be taken into account that the substrate may change their dimensions remarkably at different temperatures. Moreover, the dimensions of the JD Basic COMPACT will change at different humidity. As these changes may contradict, some space at the fastenings is necessary to allow movement of the materials.

Important:

When the fastening is done by screws or rivets, the drilled holes have to be 1,5 x Ø mm wider in diameter than the diameter of screws or rivets to allow movement.

## 5.2 Tools

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The surface of JD Basic COMPACT laminate consists of high-quality melamine resins, making it relatively hard. Tool wear will be greater than with most wood based products. Tools with tungsten carbide tipped (TCT) blades have performed adequately, with polycrystalline diamond blades (PCD) is giving a more durable option.

## 5.3 Procedure

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Machining of JD Basic COMPACT sheets should be carried out on a flat, solid surface. Avoid any vibration of the sheet. Sharp blades and smoothly running tools are essential for producing defect free machined edges. Breaking, splintering or bowing of the decorative side are the result of incorrect machining or improper tools. Any grooves created during machining can lead to the formation of cracks.

Please always assure that machining tables are always clean, as excess cutting dust or flakes may lead to scratching, when moving the sheets along the saw.

Too little chip/waste removal can impact quickly on the sawblade, sticking to the JD Basic COMPACT core. This will again lead to an increased engine power, which reduces the tool life. Are the chips/waste too small, the tool will scrape and therefore quickly dull, which gives a short tool life. When single cut of JD Basic COMPACT is done, eliminate necessarily the vibration of the sheet by using a wood based sheet on top. The amount of sheets to be cut in one process will depend on the type of sawing machine/equipment.

## 5.4 Base

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Whenever a decorative surface has to be moved over the bearing surface for machining or vice versa, it is recommended to use a guide or base (e.g. chipboard) to move along with the decorative laminate. For machine

tools it is also possible to use flat bearing surfaces with grooves, in order to keep the contact area with the decorative laminate as small as possible. No base is required for tables with air cushion supports.

## 5.5 Cutting JD Basic COMPACT

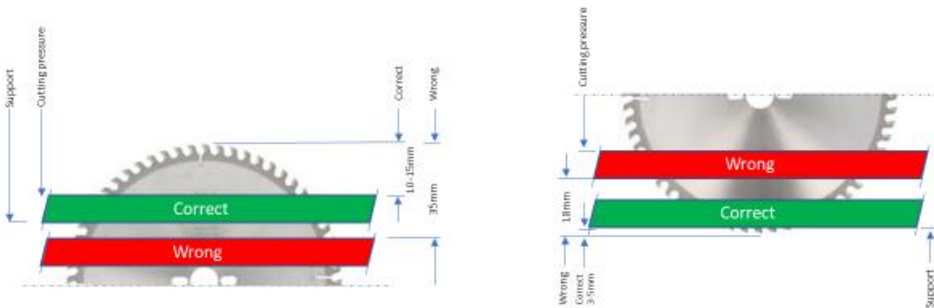
### 5.5.1 Hand cutting tools

Only in case of single cuts it is advisable to use cutting by hand tools, with small teeth. Such sawing/cutting must be done from the surface side up/backside down of the JD Basic COMPACT sheet, and the saw must be angled in about 30°.

Electrical circular cutting tools can be used for linear cuts, by using a feeding board, and teeth reinforced by hard metal layer. The cutting must be done from the surface side down/backside up, with the teeth form as follows:

### 5.5.2 Vertical saws, sliding table saws without precutting facility

To obtain the best result, use a guide or stop bar to obtain straight cuts. Cutting must be performed with the front laminate decorative side up to avoid chipping on the visible edge. This means with two visible edges requires an even more careful handling. Note the blade projection for portable circular saws with a plunge function.



**Remember acclimatization 72 hours before processing!**

### Circular saws etc. with no precutting: decorative side up!

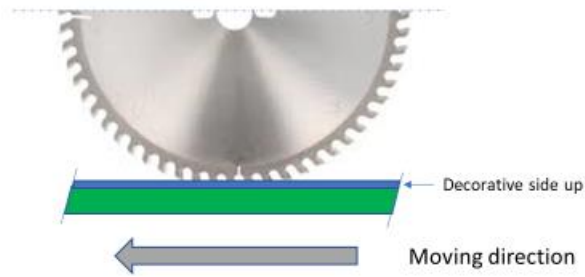


Figure 6: Correct blade projection for portable circular saws (source: Leitz GmbH & Co. KG)

### 5.5.3 Compass saws

Compass saws are suitable only for rough cutting. Cutting must be performed with the laminate decorative side down to avoid chipping on the visible edge. A clean base (e.g. felt base) should be used to protect the visible decorative side from scratching and chipping.

### 5.5.4 Vertical saws, sliding table saws with precutting facility

To achieve a good cut edge quality on the outgoing tooth side, the usage of a precutting unit is recommended. The cutting width of the precutting circular saw blade is to be adjusted only little larger than that of the main circular saw blade, in order to avoid that the exiting tooth of the main sawblade will not touch the cutting edges anymore (figure 10). The following should be observed for obtaining acceptable results:

- decorative side face up
- the quality of the cut edge depends on the height adjustment of the saw blade as well as the items mentioned below. The ideal height depends on the thickness of the decorative laminate and the circular saw blade (figure 8).

The decorative laminate should be placed flat on the cutting table and held down firmly in the region near the saw blade. A hold-down clamp or pressure bar should be used to prevent vibration of the laminate while being cut. Additional factors which can influence the quality of the cut edge include (figure 9):

- blade height
- quality and condition of machine and circular saw blade
- tooth shape
- number of teeth
- cutting speed
- feed speed

- control of material vibration

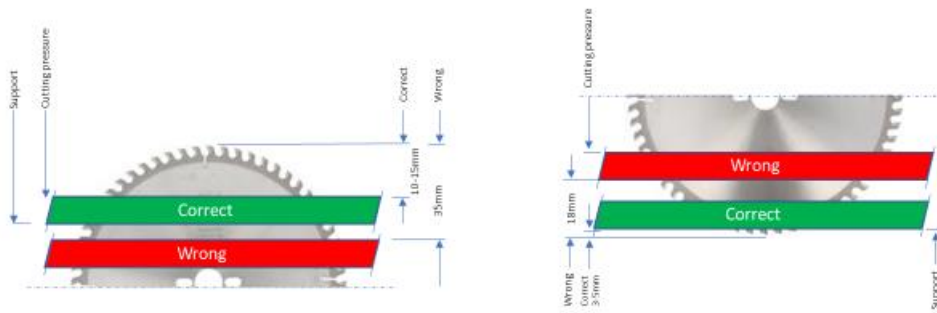


Figure 7: Correct saw blade projection for fixed circular saws and sliding table saws (source: Leitz GmbH & Co. KG).

As a safe, flat placement of the JD Basic COMPACT sheets are only guaranteed with vacuum fixing function, on table and format sawing machines, split scoring circular saw blades are to be used. Panel sizing unit with vacuum unit and pressure device.

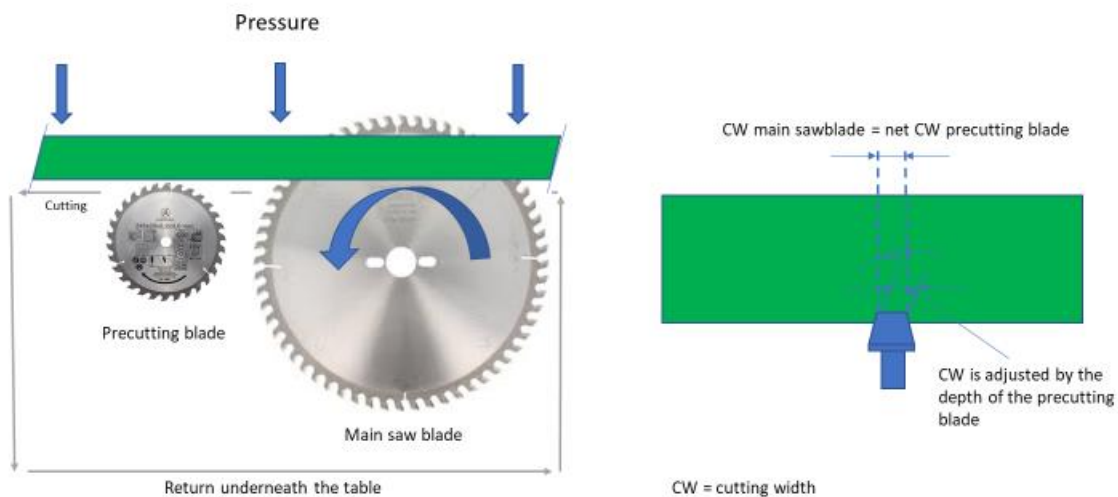


Figure 8: Fixed circular saws with precutting

Application diagram of a conical precutting circular saw blade. In the maintenance of the tools (always twice-wise) the cutting widths (SB) must be matched on each other (source: Leitz GmbH & Co. KG).

JD Basic COMPACT can also be cut in stacks depending on the sawing equipment. How many sheets to be cut per time, will depend from the sawing power.

Depending on the blade projection, change the entry and exit angles and thus the quality of the cutting edge. If the upper cut edge becomes chippy, the saw blade is to be adjusted higher. With an unclean cut at the bottom, the saw blade must be lowered. By this the best height adjustment must be determined.

NOTE: non-expectation of above criteria's may lead to extraordinary tool wear and end result may vary from the normal obtained results with other materials.

## 5.6 Tooth shapes

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The following tooth shapes are standard:

### 5.6.1 Flat top

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Is the simplest tooth shape. It features ease of use and can be easily sharpened (figure 11). Such form is however not recommended for cutting JD Basic COMPACT sheets.

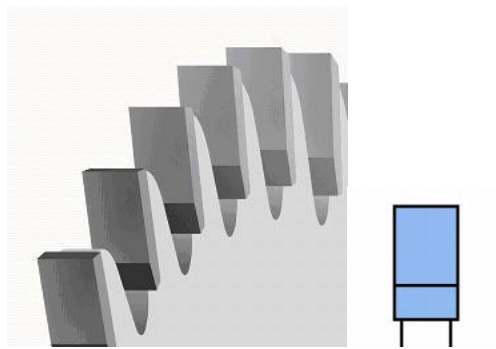


Figure 9: Flat tooth (source: Leitz GmbH & Co. KG)

### 5.6.2 Alternate top bevel

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Alternate top bevel (WZ) is the universal tooth shape for trimming and separating cuts. The tooth configuration results in a lower power consumption of the machine. The pull cut of the alternate top bevel provides excellent quality at the entry side. This blade can be easily sharpened (figure 12). Normally not recommended to fabricate JD Basic COMPACT sheets.

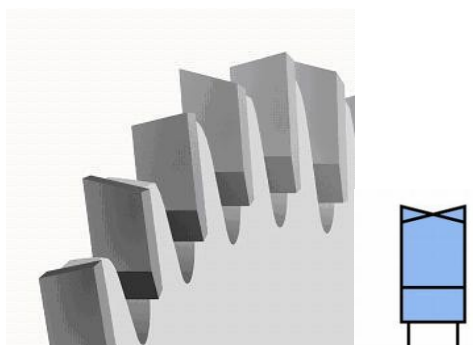


Figure 10: Alternate top bevel (source: Leitz GmbH & Co. KG)

### 5.6.3 Trapezoidal flat tooth

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Trapezoidal / flat tooth (TZ/FZ) is a combination where the trapezoidal tooth carries out the pre-chipping and guides the saw blade. It achieves a better cut quality than the alternate top bevel. This blade can be easily sharpened (figure 13). Such blade is the best advisable to use when cutting JD Basic COMPACT sheets.

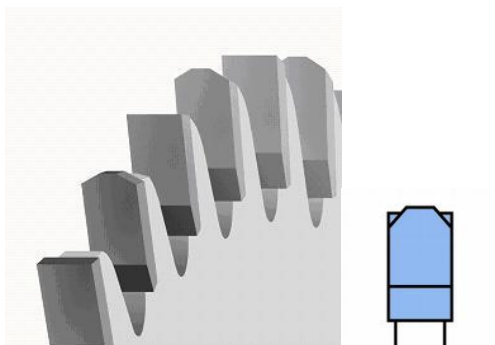


Figure 11: Trapezoidal / flat tooth (source: Leitz GmbH & Co. KG)

### 5.6.4 Top tooth/hollow tooth

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Top tooth / hollow tooth (DZ/HZ) is a combination where the high bevel tooth carries out the pre-chipping and guides the saw blade. The double-sided bevel angle resulting from the hollow grind of the hollow tooth ensures the best possible edge quality, better than the trapezoidal/flat tooth, while retaining high tool life. Proper projection of the saw blade can achieve an optimum upper and lower edge of the JD Basic COMPACT sheet. Particularly suitable for machines without a scoring unit. Sharpening this blade must be performed by a specially qualified company (figure 14).

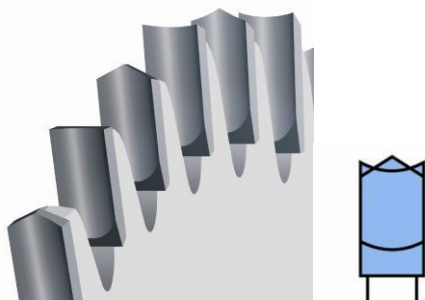


Figure 12: Top tooth/hollow tooth (source: Leitz GmbH & Co. KG)

### 5.6.5 Change teeth beveled

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Change teeth bevelled (WZ/FA) is second the best advisable tool for processing/cutting JD Basic COMPACT sheets and an alternative to c. FZ/TZ.



Figure 13: Change teeth bevelled

## 5.7 Cutting speed

Please always check in advance with the manufacturer of the cutting machine. Subsequent speed diagram lists the advised maximum operating speed and operating speed:

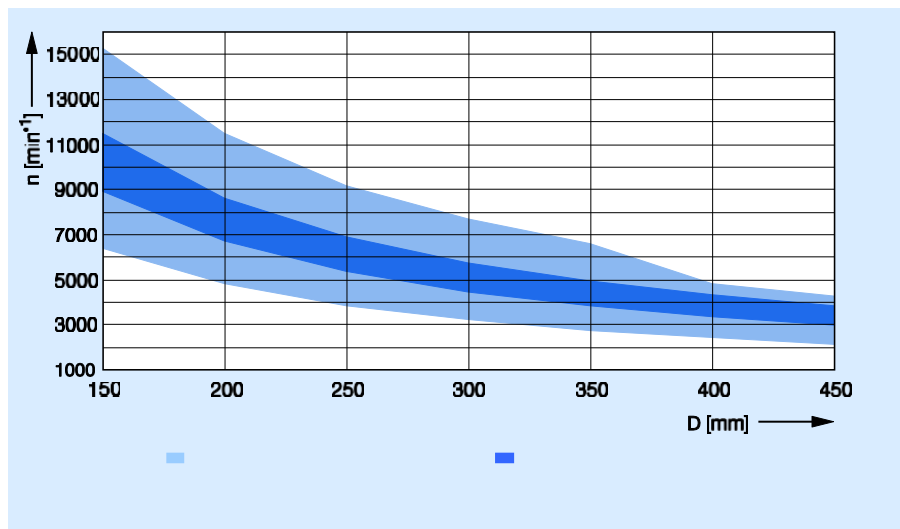


Figure 14: Speed n as a function of circular saw blade diameter D (source: Leitz GmbH & Co. KG)

When processing of JD Basic COMPACT sheets the relation between amount of teeth (z) and cutting speed ( $v_c$ ) and feeding speed ( $v_f$ ) must be considered:

Calculation of the cutting speed:

$$v_c = D \times \pi \times n / 60$$

$V_c$  = Cutting speed

D = diameter of the tool (m)

N = tools turns (min 1)

The feeding speed  $v_f$  for mechanical feed is calculated using the following formula:

$$v_f = n \times f_z \times z / 1000 \text{ where:}$$

f = feeding speed (m/min)

Z: number of teeth n: tool turns (min.1)

$f_z$  : tooth feed/speed

Recommended for JD Basic COMPACT:  $f_z = 0.03 - 0.06$  mm



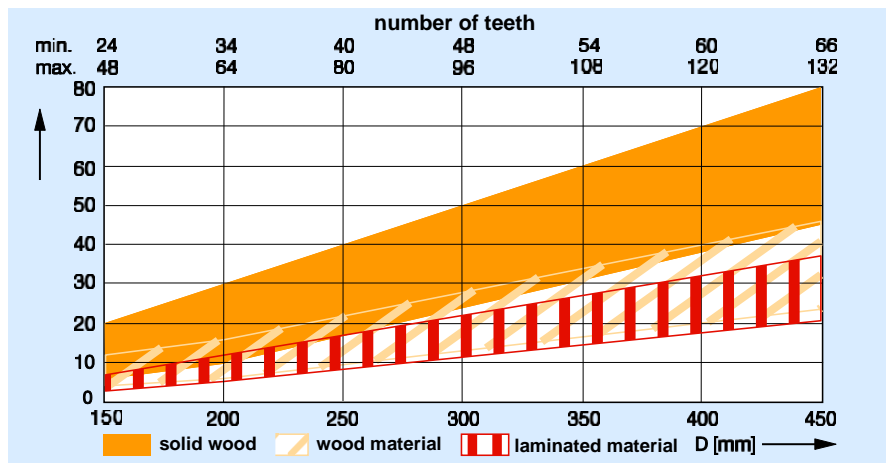


Figure 15: Cutting height as a function of circular saw blade diameter D (source: Leitz GmbH & Co. KG)

## 6. Treatment of cutting edges and profiling

### 6.1 Manual edge treatment

#### 6.1.1 File, sandpaper, scraper

Files are suitable for finishing the laminate edges. Always file from the decorative side towards the substrate. Fine files, sandpaper (100 - 150 grit) or scrapers provide good results for breaking edges. Milled edges should be finished in the following manner: Lightly break sharp and slightly sharp edges with sandpaper; smooth the edges with a scraper; break edges again with fine sandpaper; then carefully remove any dislodged sanding particles.

#### 6.1.2 Manual plane

Manual planes may be used for edge treatment as well. Metal planes with high speed steel (HSS) blades are recommended so the contact surface does not wear out when sliding along the edge of the sheet. The cutting angle of the blade should be approximately 15°.

#### 6.1.3 Edge treatment with hand-held routers

Hand-held routers are used primarily for trimming protruding sheet edges. The hand-held router must be covered with a non-abrasive material to protect the surface during sliding. Dirt particles and milling shavings should be carefully removed before and during processing.

Diameter of milling cutter: approx. 10 - 25 mm

Speed: 20,000 rpm

Cutting speed: 10 - 50 m/s

Milling cutters with single or double flute tungsten carbide tipped blades are recommended. For larger diameters these tools are also available with reversible plates. Height-adjustable milling cutters with axially parallel blades

are preferable because they allow more efficient use of the tool. Edges are broken afterwards. The sheet should only protrude as much as required (2 - 3 mm) to avoid unnecessary strain on the tool. Stronger motors are required for longer cutting periods and particularly for continuous cutting operations.

## 6.2 Edge treatment with stationary machines

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### 6.2.1 Table milling machines

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Router and cutting heads with interchangeable tungsten carbide tipped blades have proven to be effective on table routers. Parallel tools are used:

- a) with axially parallel blades for sheets visible on one or both sides
- b) with diagonal blades on one side for sheets visible on one side
- c) with diagonal blades on both sides for sheets visible on both sides

When milling JD Basic COMPACT up to approximately 5 mm thickness, the preferred speed is 12,000 rpm with a tool diameter of around 100 mm, which is equivalent to a cutting speed of 60 m/s. (Do not exceed the maximum allowed speed of the tool!). The tool life for each height setting often differs greatly depending on tool location and type, required cutting quality, and types of substrates. For large amounts of cutting, it may be beneficial to use tools with polycrystalline, height adjustable diamond cutters.

### 6.2.2 Bench routers

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Bench routers can be used with single or double flute tungsten carbide tipped cutters, also with interchangeable blades, at an ideal cutting speed of 10 – 15 m/s. This tool is also used for cutouts. Substrates covered on one side can be guided with vertical routers on a template along the follower. Substrates covered on both sides, as well as loose JD Basic COMPACT, can only be milled properly using a fixture. An allowance of 2 mm per edge is sufficient in most cases. For curved edges it is often advisable to pre-cut to the approximate shape to avoid excessive milling.

### 6.2.3 Electrical planers

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Feed speed:	5 - 15 m/min
Cutting speed:	12 - 15 m/s
Rotation:	3,000 rpm

This machine has limited suitability due to the short tool life of standard blades. Tungsten carbide tipped blades should be used for larger quantities.

## 6.3 Profiling of JD Basic COMPACT edges

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Profiling of JD Basic COMPACT edges should be carried out with tools described in sections 6.1.3 (hand-held router) or preferably 6.2.2 (bench milling machine).

JD Basic COMPACT sheets are coming with brown or black core. In order to increase the visual result of JD Basic COMPACT edges, edges can be treated with a natural oil or wax. Please assure that no remaining oil or wax are

sticking to the sheets surfaces or onto the edges. All excess oil or wax must be removed by a dry cloth immediately.

## 7. JD Basic COMPACT drilling

### 7.1 General drilling advices

Before drilling please always contact your local drill and screw supplier for exact advices. The following general advices can be given:

For drilling in JD Basic COMPACT sheets, solid carbide drills, spiral drills or dowel drill are recommended to be used. On CNC machining center the use of the efforts in the main spindle instead of in the boring bar at the speed 2000 - 4000 min<sup>-1</sup> and moving speed of 1.4 – 3,1 m / min. is recommended. The exit speed of the drill on the other side of the JD Basic COMPACT sheet must be chosen so that the melamine surface is not damaged. Shortly before the drill with full diameter leaves through the JD Basic COMPACT sheet, the drilling speed must be reduced by app. 50%.

When drilling holes through the JD Basic COMPACT sheet (figure 18), drill carefully and using pressure from underneath by a hardwood sheet or equivalent, to prevent the breaking out of the melamine surface.

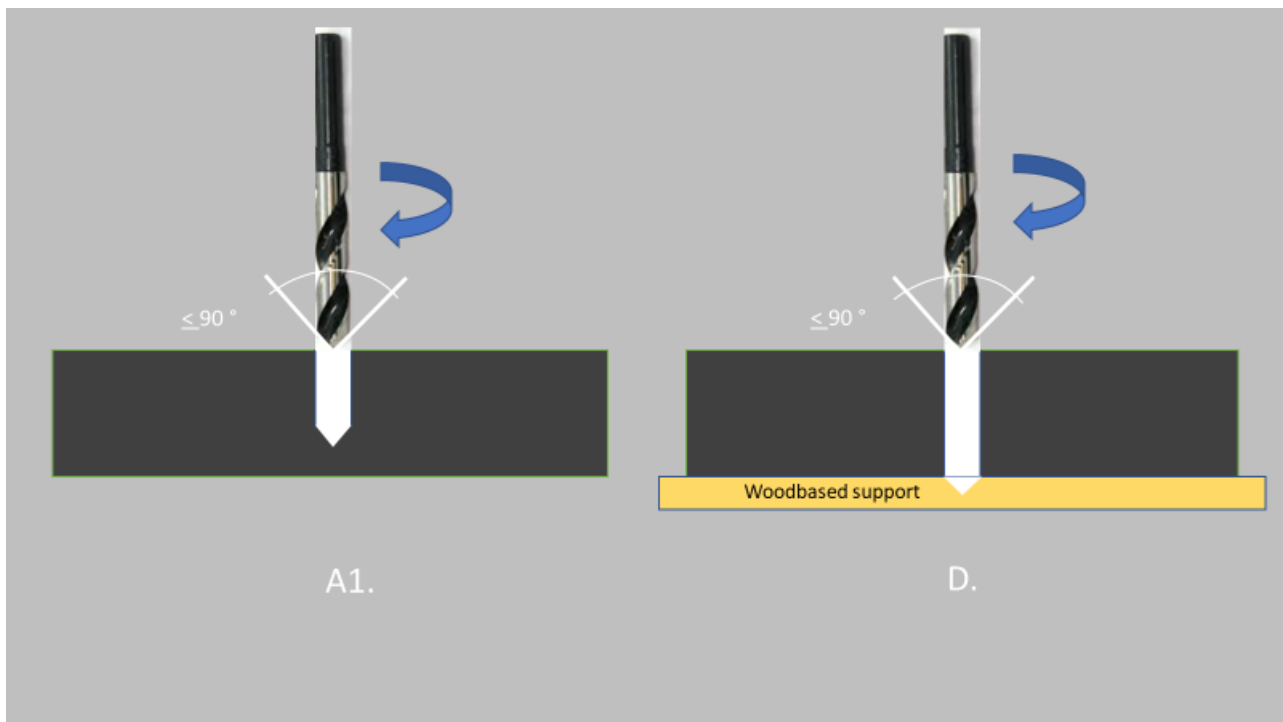


Figure 16: Drilling with support

For blind holes (D), vertical to the sheet level please note:

- Pre - drilling diameter (D) = Screw wave diameter (A2) minus about 1 mm
- Depth of hole (B) = thickness of the sheet minus 1-1.5 mm
- Screwing depth = Depth of hole (B) minus 1 mm

For full holes (A1) all through: Pre drilling diameter: min 1,5 x A

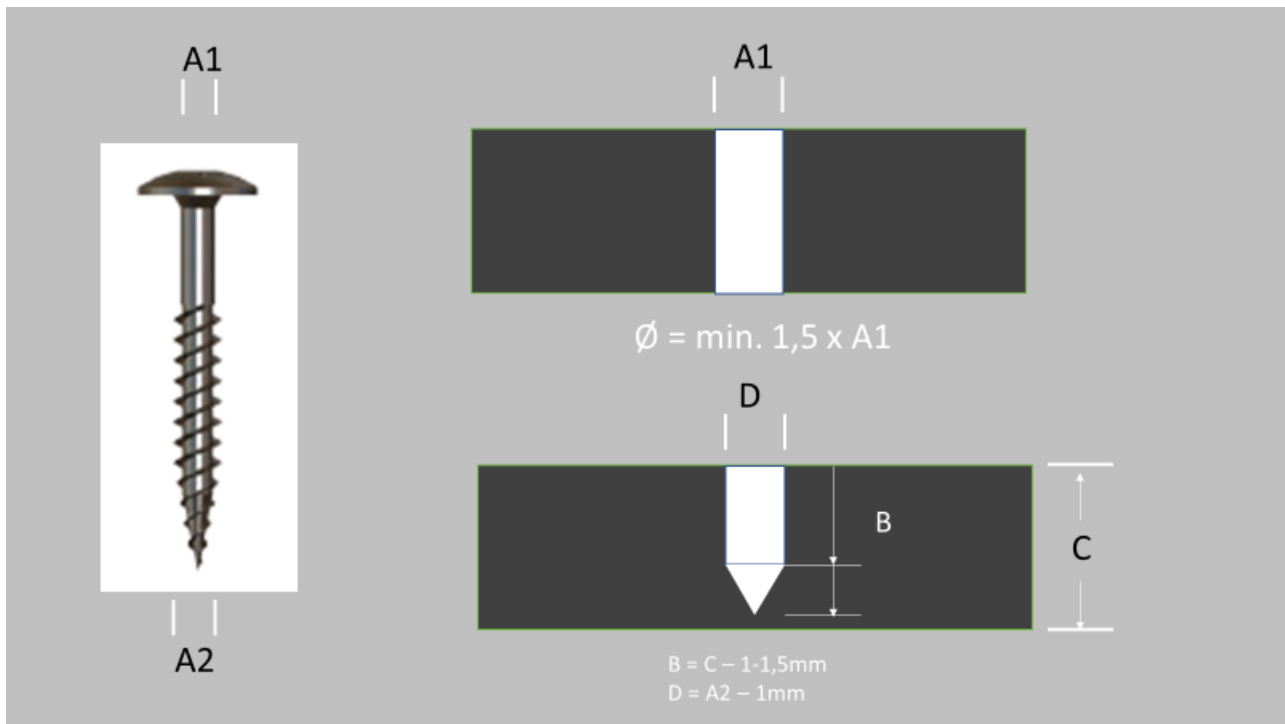


Figure 17: Full holes

When screwing parallel to the board level is to be noted (figure 20):

- The residual thickness (b) of the JD Basic COMPACT sheet must not be less than 3mm.
- The diameter of hole must be chosen in order not to cause crazing when entering the screw.
- For screwing parallel to the plate surface, soft metal and chipboard screws are recommended to be used.
- To achieve stability, is a minimum depth of engagement of 25 mm is necessary necessary.

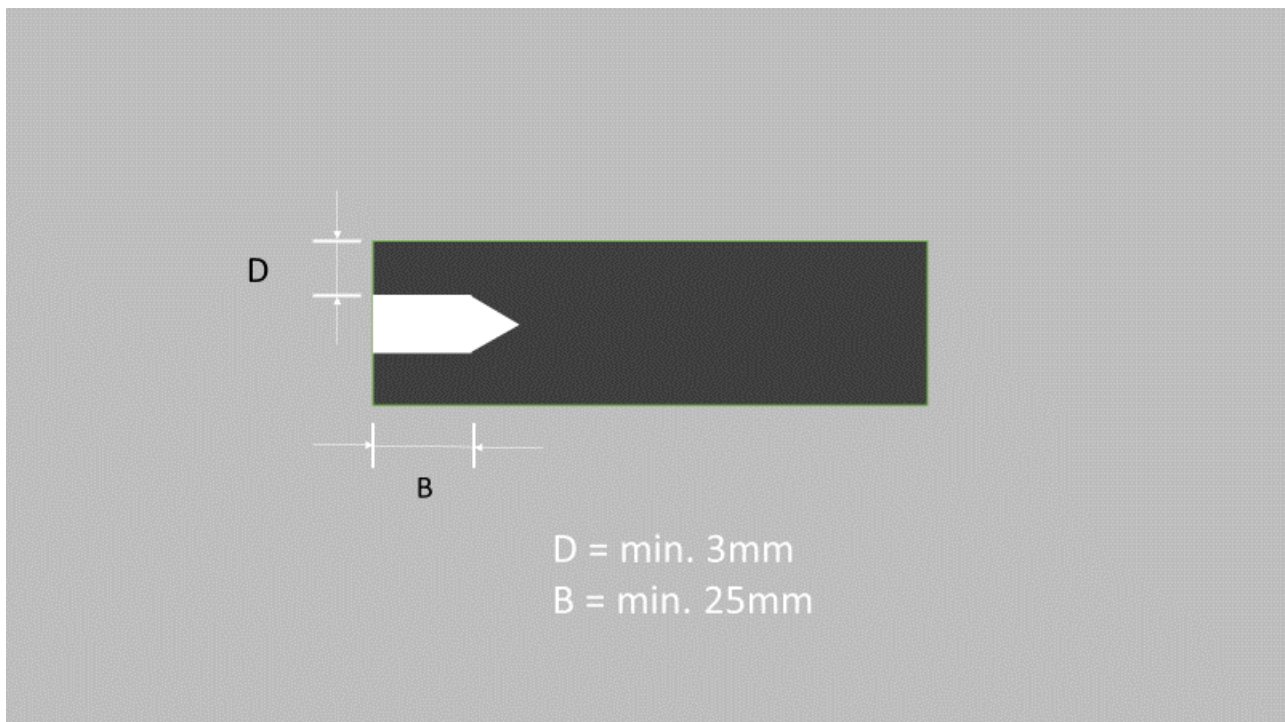


Figure 18: Parallel holes

For drilling of JD Basic COMPACT sheets, the best drills are drills normally used for plastics. These are twist drills with a point angle of  $\leq 90^\circ$ . They have a big slope with big width. By the steep peak these drills are also for drilling holes

well through the JD Basic COMPACT sheets, since they cut clean through the material back.

The depth penetration rate of the drill has to be adjusted to avoid damaging the decorative laminate. The cutting speed for HS drills is approx. 0.8 m/s, for TST drills up to 1.6 m/s. A feed of 0.02 - 0.05 mm/rev is considered suitable, i.e. for every 1000 revolutions the drill penetrates between 20 mm and 50 mm per minute.

Using a hardwood or laminate base can prevent (figure 18) buckling of the material at the exit point of the drill. For large scale production, even better results can be achieved with drill gauges which have drill bushings on both sides and allow tight clamping of the workpiece. Speeds should be reduced by half for countersinking.

## 7.2 Drilling tools

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There are several drills to select among:

### 7.2.1 Spiral drills

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When drilling JD Basic COMPACT, special drill (figure 22) bits are recommended. The recommend tools are spiral drills with a point angle of  $60^\circ$  to  $90^\circ$  (figure 14). The laminate spiral drills also have a steep pitch (steep spiral) with large chip space (wide grooves). High speed steel (HSS) drills are recommended for hand-held tools, and tungsten carbide (TCT) drills for machines with mechanical feed. The recommended rotational speed is 1,500 - 3,500 rpm. It is possible to buy a depth controller (figure 21) for step drill, see JD Basic accessories list.



Figure 19: Depth controller

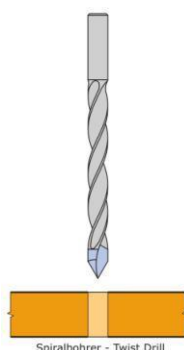


Figure 20: Spiral drill for JD Basic COMPACT (source: Leitz GmbH & Co. KG)

### 7.2.2 VHM drill

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Full face tungsten carbide (VHM) façade tile drills for inserting fixing holes in façade panels made of HPL, fiber cement and fiber concrete. This drill ensures clean hole edges. Precise drilling through the centering point.

Drill with special coating and three clamping surfaces for long service life. Available in 7mm, 8mm, 8.5mm and 10mm diameter.

Special sizes on request.



Figure 21: VHM drills

### 7.2.3 Universal drill

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Flat peaks, where the diameter is identical to the drilling diameter. To be used for general drilling of holes, blind holes and holes all way through the JD Basic COMPACT sheet.



Figure 22: Universal spiral drills

### 7.2.4 Drill for blind holes

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Such kind of drill is especially well for drilling of blind holes in JD Basic COMPACT sheets. Not suitable for drilling holes all through the sheets.



Figure 23: Multi-diameter/step drill (source: Leitz GmbH & Co. KG)

## 7.2.5 Center drill assistance

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Can be used for centric drilling of fixation holes through cladding material in to the substructure, for instance for blind rivet fixation. In case of expending materials a tension free fixation is created.



Figure 24: Center drill assistance tool

In general drills covers or reinforced by diamond layer are not advisable when processing JD Basic COMPACT.

## 8. Technical tables

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### 8.1 Tool data

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The following table provides sum-up guidelines for machining JD Basic COMPACT:

Process	Machine	Cutting speed	Speed (rpm)	Feed (m/mi)
Sheet cutting	Sheet cutting saws	60 - 100	approx. 3,000 - 6,000	approx. 10 - 30
Cutting to size	Bench, panel and hand-held circular saw, MC*	30 - 100	approx. 3,000 - 6,000	up to approx. 10
Machining	Double-end profiler, pre-scoring, cutting	40 - 60	approx. 6,000	approx. 6 - 60
Milling edges	Bench milling machine or edge-treatment	40 - 60	up to 12,000	approx. 6 - 24
Milling	Hand-held router	10 - 25	approx. 12,000 -	approx. 3 -
Grooves	Circular table saw, bench milling machine,	40 - 100	approx. 3,000 - 6,000	approx. 3 - 10
Grooves	Double-end	40 - 60	approx. 6,000 -	approx. 6 -
Grooves	Milling machine, hand-held	10 - 25	approx. 12,000 - 27,000	approx. 3 - 8
Drilling	Drilling machine, dowel machine, MC*		approx. 3,000 - 6,000	approx. 0.5 - 3

\* MC: CNC machining centre

Figure 25: Sum-up tool table

## 8.2 Cutting speed and tool diameter

The curves in figure 28 show cutting speeds in m/s, determined using rotational speed and tool diameter. If tool diameter and cutting speed are given, the required rotational speed can be determined from the graph. Similarly, the tool diameter can be determined if rotational speed and cutting speed are given.

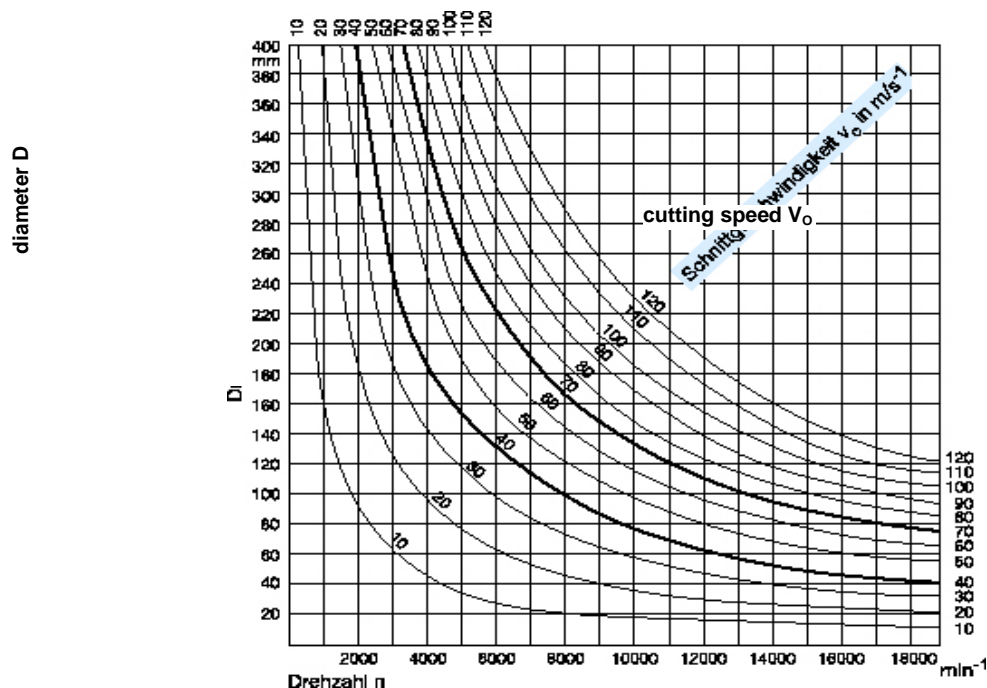


Figure 26: Cutting speed as a function of rotational speed and tool diameter (source: Leitz GmbH & Co. KG)



## 9. Cleaning and maintenance

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With their durable, hygienic and watertight surface JD Basic COMPACT require no special maintenance. The surface can be cleaned with warm water followed by wiping dry with a paper towel or a soft cloth. Persistent marks can usually be removed with non-abrasive household cleaners such as washing powder without scouring or bleaching means, liquid or solid soap. Removing stubborn stains may require leaving the cleaning agent in contact with the stain for a longer period of time. After the extended application of the cleaning agent, rinse with water and dry; repeat several times if necessary. Remove all residue of the cleaning agent to prevent smear marks. Dry the surface with a clean, absorbent cloth or a paper towel. The procedure for removing stains can be improved by using a sponge or nylon brush, never use steel wool or similar.

### 9.1 Staining caused by household chemicals

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JD Basic COMPACT are a homogeneous, non-porous material and resistant to most household chemicals. Even though liquids cannot penetrate the material, stains should be wiped off immediately. Prolonged contact with caustic substances such as aggressive household cleaners, toilet, and oven cleaners should be avoided.

### 9.2 Staining caused by lime

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Clean the surface with warm 10% vinegar or citric acid solution and rinse with hot water. When using a household scale remover the surface must be immediately rinsed with water.

### 9.3 Staining caused by paraffin or wax residue

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Paraffin or wax residue should first be removed mechanically using a plastic or wooden spatula to avoid scratching the surface. Cover any remaining residue with an absorbent paper and briefly apply heat with a hot iron.

### 9.4 Staining caused by water-soluble paints, varnishes and adhesives

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Fresh stains can usually be removed with warm water. Dried residue can be removed with solvents such as ethanol, acetone, mineral spirits, lacquer thinner, or nail polish remover. The corresponding recommendations of the manufacturer should also be observed.

### 9.5 Staining caused by solvent-based paints, varnishes and adhesives

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Both fresh stains dried stain residue can usually be removed with solvents. Suitable solvents are ethanol, acetone, mineral spirits, lacquer thinner, or nail polish remover. Follow the recommendations of the solvent manufacturer.

### 9.6 Staining caused by two component adhesives and varnishes

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Two component adhesives and varnishes are generally based on epoxy resin or polyurethane (PUR). Staining caused by two component adhesives and varnishes must be removed from the decorative laminate immediately. After hardening it is usually not possible to remove these materials without leaving residue. The surface should be cleaned with a suitable solvent immediately, making sure to follow the information from the manufacturer of the adhesive or varnish system.

## 9.7 Staining caused by sealing material on silicone or polyurethane

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Sealing material residue should first be removed mechanically using a plastic or wooden spatula to avoid scratching the surface. Any remaining residue can be cleaned with suitable removers (e.g. silicone remover), even after prolonged exposure. Prolonged exposure of the silicon remover can result in changes on the laminate surface. Follow the recommendations provided by the manufacturer of the removal system.

## 9.8 Staining caused by solvents

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After coming into contact with solvents the surface should be rinsed with hot water, then dried with a clean, soft, absorbent cloth or paper towel. Cleaning agents containing stronger acids or bleaching additives (e.g. toilet cleaner, amidosulfon-acid based scale removers) should not come into contact with decorative laminate surfaces. If contact occurs, they must be wiped off immediately.

## 10. Environment and disposal

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Resins used to make JD Basic COMPACT are thermosets and once cured are relatively inert, hard, non-corrosive and non-oxidizing. There is no migration to food, therefore, they are safe and approved for food contact.

JD Basic COMPACT are difficult to ignite and also delay flame spread, providing increased evacuation time. The same fire fighting techniques as for other building materials containing wood can be used for fires involving JD Basic COMPACT.

The high thermal value of JD Basic COMPACT makes them suitable for energy recovery. Modern, approved industrial incineration plants provide the recommended conditions for clean burning.

JD Basic COMPACT can normally be disposed of as household waste, observing local municipal regulations.

## 11. Imprint

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