Quality of the Arunda materials

- **The Arunda jigs** are made of **galvanized steel**. The plates are 10 and 8 mm thick, the stops measure 5 mm. These jigs are non-deformable, everlasting and shock-resistant. They are thus immune to any serious damage if accidentally touched by the cutter.
- The two router **expansion plates** are made of **stainless steel**. They are thus particularly resistant to shock and wear.
- **The Arunda bit** is made of the **best cutting-tool steel,** with a precision tolerance of +4/-6 hundredths of a millimeter. **The blades** are of **hard metal** (Tungsten Carbide or HM).
- **The setting gauge** is precisely machined from **solid aluminium** in order to protect the blades, when the cutter rests on the gauge for calibrating.
- **The guide ring** is made of **chilled, galvanized steel** to resist friction with the jigs.

We do not use synthetic or light materials such as aluminium in the manufacturing of Arunda tools (with exception of the setting gauge, which is made from Aluminium).

Arunda tools are manufactured to meet the high demands of professional timber framing. They are made to last and offer optimum quality over the long-term.

One single model or four different jigs?

<u>We deliberately do not produce a single jig!</u>

A single model would make it possible to work on all wood dimensions, with timber widths from 40 to 300 mm. Such a jig would have the shape of a very narrow dovetail, usable on timbers as narrow as 40 mm, but leaving a broad shoulder for the passage of the router on wide beams (up to 300 mm). However, this simplification would generate a significant problem relating to the working load of the connections: <u>a very narrow dovetail only permits a small working load</u>! Conversely, **the broader the dovetail, the greater the working load!**

This shows the importance of choosing between several jig models, each of them fulfilling very different criteria. The chosen model will correspond to the timber width used by the carpenter, and will therefore ensure a higher resistance of the produced connection. **With Arunda: the bigger the timber, the broader and the stronger the joint!**

4 different jig models!

Arunda jigs No. 80 and 120 are the models in greatest demand. Model 80, for example, makes it possible to work on joists/rafters from **80 to 140 mm** in width, while model No. 120 is adapted for joists/rafters from **120 to 180** (200) **mm** in width. Although a 120 mm wide timber can be assembled with the No. 80 jig model, jig No. 120 will create a wider dovetail than model No. 80, permitting a greater working load. This example shows that each of the four jig models allows to work with various timber widths but that it is judicious, to use a higher jig model in order to obtain a greater working load, stability and safety.

Numerous project studies, and our engineering calculations have determined the quality requirements of the Arunda system. The best option consisted in creating 4 different jig models - each intended for a very specific range of timber widths.

(See next page: *Tables of timber widths and working loads*)

ARUNDA info

Tables of timber widths and working loads

Timber width (mm): 40 – 100 – 150 – 200 – 250 – 300

Model	Timber width	Height	Min. / max. section (width x height)	Optimal timber widths	Min. / max. feasible timber widths	Min. / max. working loads
50 B / 50 N	40-100	90-330	min. 40 x 90 / max. 100 x 330 mm	45 - 100 mm		240 - 760 kg
80 B / 80 N	80-140	90-330	min. 80 x 90 / max. 140 x 330 mm	80 - 140 mm		330 - 990 kg
120 B / 120 N	120-200	90-380	min. 120 x 90 / max. 200 x 380 mm	120 - 180 mm	max. 200	500 - 1'650 kg
160 B	160-300	90-400	min. 150 x 90 / max. 300 x 400 mm	160 - 300 mm	(150)	560 - 2'100 kg

Min. / max. section (width x height)

Optimal timber widths

Min. / max. feasible timber widths

Min. / max. working loads (lbs) depending on dimensions

Timber width (inches): 1 3/4" – 4" – 6" – 8" – 10" – 12"

Model	Timber width	Height	Min. / max. section (width x height)	Optimal timber widths	Min. / max. working loads
50 B / 50 N	1 3/4 - 4"	3 1/3 - 13"	min. 1 3/4 x 3 1/2" / max. 4 x 13"	1 3/4 - 4"	528 - 1'672 lbs
80 B / 80 N	3 1/8 - 5 1/2"	3 1/2 - 13"	min. 3 1/8 x 3 1/2" / max. 5 1/2 x 13"	3 1/8 - 5 1/2"	726 - 2'178 lbs
120 B / 120 N	3 3/4 - 8"	3 1/2 - 15"	min. 3 3/4 x 3 1/2" / max. 8 x 15"	4 3/4 - 8"	1'100 - 3'630 lbs
160 B	6 - 12"	3 1/2 - 16"	min. 6 x 3 1/2 / max. 12 x 16"	6 - 12"	1'232 - 4'620 lbs

Min. / max. section (width x height)

Optimal timber widths

Min. / max. working loads (lbs) depending on dimensions

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Strength of the Arunda connections

Working loads of two dovetails of different heights, each executed with all four Arunda jigs:

	Jig No. 50	Jig No. 80	Jig No. 120	Jig No. 160
Height of the tail 140 mm + Resistance/working load of the tail	**140 mm = 890 kg**	**140 mm = 966 kg**	**140 mm = 1100 kg**	**140 mm = 1152 kg**
Height of the tail 230 mm + Resistance/working load of the tail	**230 mm = 980 kg**	**230 mm = 1056 kg**	**230 mm = 1200 kg**	**230 mm = 1242 kg**

These variations in working load clearly indicate the benefits of using the individual jigs, and the need for adapting the model size to timber widths. The above comparison shows that it is always beneficial to use the largest possible jig.
The table of work loads also proves that it is unnecessary to reinforce an Arunda dovetail joint with additional connectors (bolts, steel plates, etc.), in any common form of timber construction.

Angles of the tenon-mortise joint

The mortises and tenons of a dovetail connection created with Arunda have optimized angles (face angles of the dovetails, and cutting angles of the bit). These angles have been calculated to provide:

- The best resistance of an assembly.
- The best tightening (wedging of the tenon into the mortise), guaranteeing the good stability of the assembly, and therefore determining the working load.
- The best positioning of the tenon inside the mortise. During assembly, this ensures that the once inserted tenon cannot slip out of the mortise. The joint timbers can only be disengaged upwards, but not outwards as would happen with shallower angles.

Moreover, the Arunda jigs generate flat base of the dovetail joint, in order to offer good support of the tenon on the bottom of the mortise. This overall stability of the assembled connection, combined with the lateral gripping force obtained (friction between the sides of tenon and mortise) provides maximum safety and working load.

Positioning and fastening of the jigs

The Arunda jigs are easily positioned on the timbers, without marking or measuring. The male jig is positioned by means of the “stepped” stop, which allows it to be centered across the width of the timber. The female jig is positioned by aligning the axis of the joist or rafter on the "V" notch of the jig. Fast and simple!

In most current applications, the jigs are fastened by means of Arunda fast lever clamps (Items No. 04.3014 and 04.4014). This is by far the fastest and most stable method. By comparison, screwing is much slower, and leaves screw holes. Moreover only strong clamping guarantees the tight attachment of the male template (outer frame on the dovetail jig) onto the timber, while pressure is applied during router action!

Sale by ARUNDA retailers

The Arunda system is sold exclusively – in each country – by Arunda retailers. We will refuse any request for individual sales to an end users, and will refer them to a local dealership.

International patent

In November 2004, a first patent for the Arunda system was applied for in Switzerland (No. 01904/04). A second international patent application (PCT) with priority rights was filed on July 13th, 2005 (No. PCT/CH2005/000400). On September 3rd, 2008 **the European Patent Office** granted the **PATENT No. 1812213** for our **INVENTION** of *jigs for producing joints for wooden beams*. Any similar object taking up the specifications of our patented invention must be considered as a **presumed infringement that is likely to be sued in court.**

The Arunda technical team