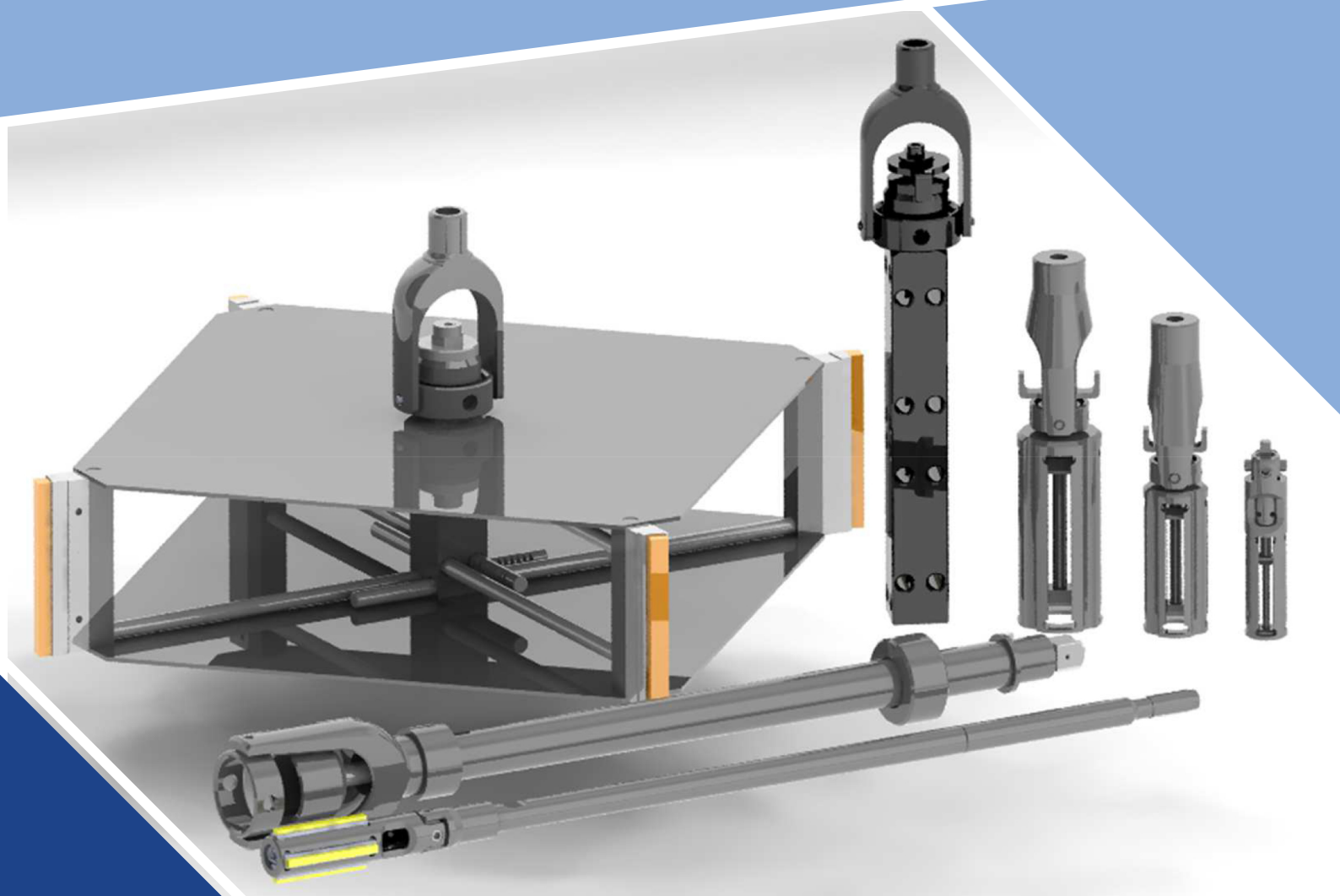


Vertical Honing Tooling

For Honing diameter
Ø25 to Ø762 mm



Delapena Vertical Honing System

The system is especially suited to the Delapena range of honing machines which possess the power and performance to accurately hone bore diameters up to 762mm. The simple interchange of honing heads ensures application versatility and production efficiency. The vertical honing system can also be used with a variety of equipment, including tube hones, borers, radial or pillar drills and portable power tools.

THE FRICTION FEED UNIT

The friction feed unit facilitates honing stone contraction and expansion whilst the stones are rotating in the bore, eliminating the need to halt the process to adjust honing pressure. Control of stone pressure provides improved accuracy and consistency of the honing process.

THE HONING HEADS

The three smaller honing heads use a twin cone expansion mechanism. These heads accommodate stone sets mounted directly to the head and are suitable for bore diameters of up to 68.3mm. The three larger hone heads use a rack and pinion expansion mechanism.

THE STONE SETS

Unless otherwise ordered, standard stone sets will be supplied as follows :

MIDGET: Four stone sets

MINOR: Option of; - two stone sets and two guides or - four stone sets

JUNIOR: Option of; - two stone sets and two guides or - four stone sets

STANDARD: Option of; - two stone sets and two guides or - four stone sets

MAJOR: Uses two "standard" stone sets

GIANT: Uses two "standard" stone sets

Where bore irregularities, such as ovality need to be corrected, two stones and two guides should always be specified.

THE STONE CARRIERS

For smaller diameters, within the standard head range, stone sets are mounted directly onto the hone head. For standard head applications of greater than 92.25mm diameter and all major and giant head applications stone carriers are required. These reusable units take replaceable, plug-in stone sets, which are interchangeable to ensure that a small range of stones cover a wide variety of applications.

THE STONE SUPPORTS

For bore diameters greater than 158.75mm, additional rigidity is provided to the honing head assembly by incorporating a stone support. The stone support steadies the stone carriers and stones to ensure consistent honing performance.



Vertical Honing Tooling

THE FRICTION FEED UNIT

The friction feed unit facilitates honing efficiency and productivity by enabling the control of stone expansion and contraction whilst the hone is still rotating in the bore.

Two versions are available:

1301 - Manual feed unit - adjusted by hand

1302 - Auto feed unit - pneumatically adjusted when connected to machine control system and supplied as standard with the Delapena Powerhone Machine.

THE DRIVESHAFT

Driveshafts are available in a wide range of lengths for both friction feed and manually adjusted operation. Standard manual driveshafts have a hex drive.

see page.7 for manual driveshaft configurations

THE HONING HEAD

Six different honing heads to accommodate bore diameters from 25.4 to 762mm.

For diameters above 95mm carrier sets are required

For diameters above 158mm supports are also required

THE STONE SET

Subject to honing application, sets may be configured with two stones and two guides or with four stones (shown). A comprehensive range of abrasives, grit sizes and bonds is available. See page.6



carrier sets

SPECIFYING AND ORDERING

When ordering Delapena vertical tooling consider the following :

- Type of drive mechanism
- Manual or auto adjustment
- Honing diameter and material
- Drive shaft length
- Stone length, grade and whether guides are required

Tooling Selection Chart

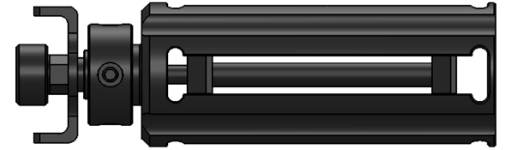
Select head based on honing diameter, stone length and whether manual or friction feed operation is required.



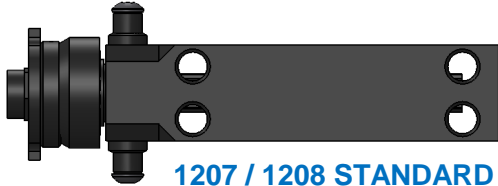
1201 / 1202 MIDGET



1203 / 1204 MINOR



1205 / 1206 JUNIOR



1207 / 1208 STANDARD



1209 / 1210 MAJOR

Type	Manual	Friction Feed	Ø Range				Stone Assy						
			mm		ins		Carrier	Support	*Stone Type	Stone Length	rpm Range		
MIDGET	1201	1202	25.4	31.7	1.00	1.25			26	57.1	250		
			31.7	38.1	1.25	1.50			27		150		
MINOR	1203	1204	38.1	44.4	1.50	1.75			28 / 284	76.2	250		
			44.4	50.8	1.75	2.00			29 / 294		150		
			50.8	55.8	2.00	2.20			30 / 304				
JUNIOR	1205	1206	50.8	55.8	2.00	2.20			T / T4	101.6	175		
			55.8	60.9	2.20	2.40			U / U4		100		
			60.9	68.3	2.40	2.69			V / V4				
STANDARD and **MAJOR Standard = Single Length ***Major = Double Length ** Order 2-Off each Standard head items for "Major Head"	1207 / **1209	1208 / **1210	65	99	2.56	3.90			G2 / G4	101.6 ** (x2)	125		
			68	107	2.68	4.21			M2 / M4				
			85	138	3.35	5.43			N2 / N4				
			92	138	3.62	5.43			1231			PT2 / PT4	
			112	176	4.41	6.93			1232				
			157	227	6.18	8.94			1233				1263
			201	309	7.91	12.17			1234				1264
			277	384	10.91	15.12			1235				1265
			354	447	13.94	17.60			1236				1266
			430	536	16.93	21.10			1237				1267
			519	612	20.43	24.09			1238				1268
			595	688	23.43	27.09			1239				1269
670	752	26.38	29.61	1240	1270								
GIANT Order 2-Off each Stone Sets	GH832		368.3	457.2	14.50	18.00	H832/30	PT2 / PT4	101.6 (x2)	60			
			457.2	533.4	18.00	21.00	H832/40						
			533.4	609	21.00	23.98	H832/50						
			609	686	23.98	27.01	H832/60						
			686	762	27.01	30.00	H832/70				40		

*Notes :-

1. If four stone sets are required, add a suffix "4" after the stone type. i.e 294, V4, etc
2. Four stone sets are only available for the "Midget" hone heads
3. Delapena Heavy Duty stone sets can also be used with all Standard, Major and Giant hone heads. Please see page 6 for ordering details.

Friction Feed Drive Shaft Selection Chart

Drive shafts used with friction feed units

Type	Friction Feed	Drive Shaft Length (mm / ins)							
		330 / 13	356 / 14	483 / 19	508 / 20	635 / 25	660 / 26	838 / 33	864 / 34
MIDGET	1202		1321		1322		1323		
MINOR	1204		1331		1332		1333		1334
JUNIOR	1206		1341		1342		1343		1344
STANDARD / MAJOR	1208 / 1210	1351		1352		1353		1354	



Driveshaft length can be manufactured to suit customer specific requirements. Delapena driveshafts can also be supplied to fit other machine types such as bayonet or screw attachment.

Please contact Delapena with requirements.

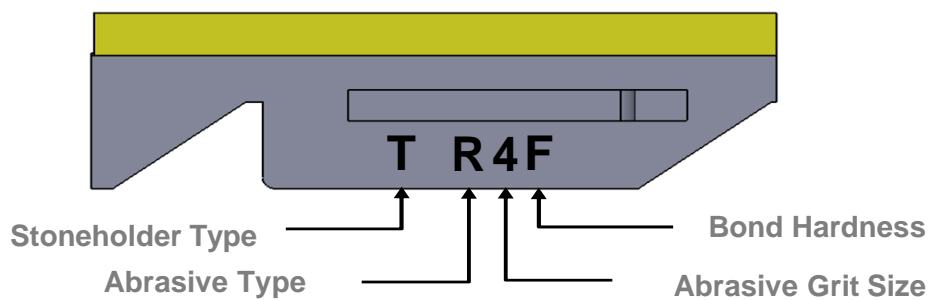
For manual head drive shafts please see page.7 for the full range and adaptations available.

Stone Identification

There are three variables in the specification of honing stones :

stoneholder type
abrasive type
grit size
bond hardness

The diagram shows the identification and coding of these variables used on Delapena honing stones.



see page.6 for examples of stone grades and applications.

Abrasive Types

C – (Bauxite) used on hard chrome and hardened steels

F – (Silicon Carbide) used on very soft and very hard materials

R – (Aluminium Oxide) used for deburring and for rapid stock removal on softer steels

S – (Sulphur treated) used when pick-up or heat build up may be an issue. Indicated as a suffix on the stone identification code.

SF – (Impregnated Graphite) used for super finishing.

C6YCK – (Cork Bonded)

Grit Size

Honing stones are available in grit sizes from 60-500 specified by the following coding:

Code	0	1	2	3	4	6	8
Grit Size	60	80	120	180	220	320	500

Bond Hardness

Hard bond should be specified for soft materials and soft bonds for hard materials. The coding for bond hardness ranges from A (very soft) through to J (very hard)

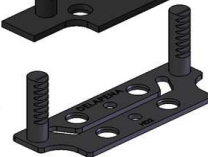
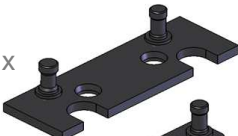
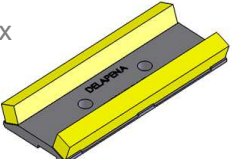
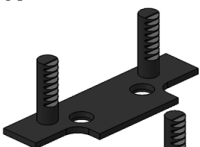
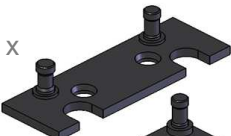

Stone Selection

There are a number of variables to be considered when specifying the optimum stone for a specific application, including material type, bore condition, bore type, stock removal allowance, surface finish, honing speed, stone area, stone pressure, reciprocation speed and honing fluid. These variables have been taken into account in the compilation of the stone selection guide below.

STONE SELECTION GUIDE						
Size Range	Operation	Cast Iron	Soft Steel	Stainless Steel	Hard Steel	Non Ferrous
Midget	Rough	F2F	R3E/S	R3E/S C3C	R4C C3C	F2F
	Finish	F6F	F6C	F6C C6C	R6C C6C	F6C
	Polish	F8F	F8C	F8C C8C	C8C	F8C
Minor	Rough	F0F	R3E/S	R3E/S C3C	R4C C3C	F2F
	Finish	F3F F6F	F6C	F6C C6C	R6C C6C	F6C
	Polish	F8F	F8C	F8C C8C	C8C	F8C
Junior	Rough	F0F	R3E/S	R3E/S C3C	R4C C3C	F1F
	Finish	F3F F6F	F6C	F6C C6C	R6C C6C	F6C
	Polish	F8F	F8C	F8C C8C	C8C	F8C
Standard	Rough	F0F	R3E/S	R3E/S C3C	R4A C3C	F0F
	Finish	F2F F6F	F3C F6C	F6C C6C	C6C	F6C
	Polish	F8F	F8C	F8C C8C	C8C	F8C
Major	Rough	F0C	R3E/S	R3E/S C3C	R4A C3C	F0F
	Finish	F3C	F3C F6C	F6C C6C	C6C	F6C
	Polish	F8C	F8C	F8C C8C	C8C	F8C

Heavy Duty Stone Sets

Delapenas range of Heavy Duty stone sets can be used on the Standard / Major tool heads.

	Stone Sets	Adaptor Sets	
HD2	2 double stones and 2 guides Stone = L100 x H8.5 x W8.5 	G M N 2 x  2 x 	PT 2 x  2 x 
HD4	4 double stones Stone = L100 x H8.5 x W8.5 4 x 	G M N 2 x  2 x 	PT 2 x  2 x 

Ordering example :-

for a honing diameter of Ø112 and 2 stones with 2 guides order - HD2 PT - add stone grade as a suffix

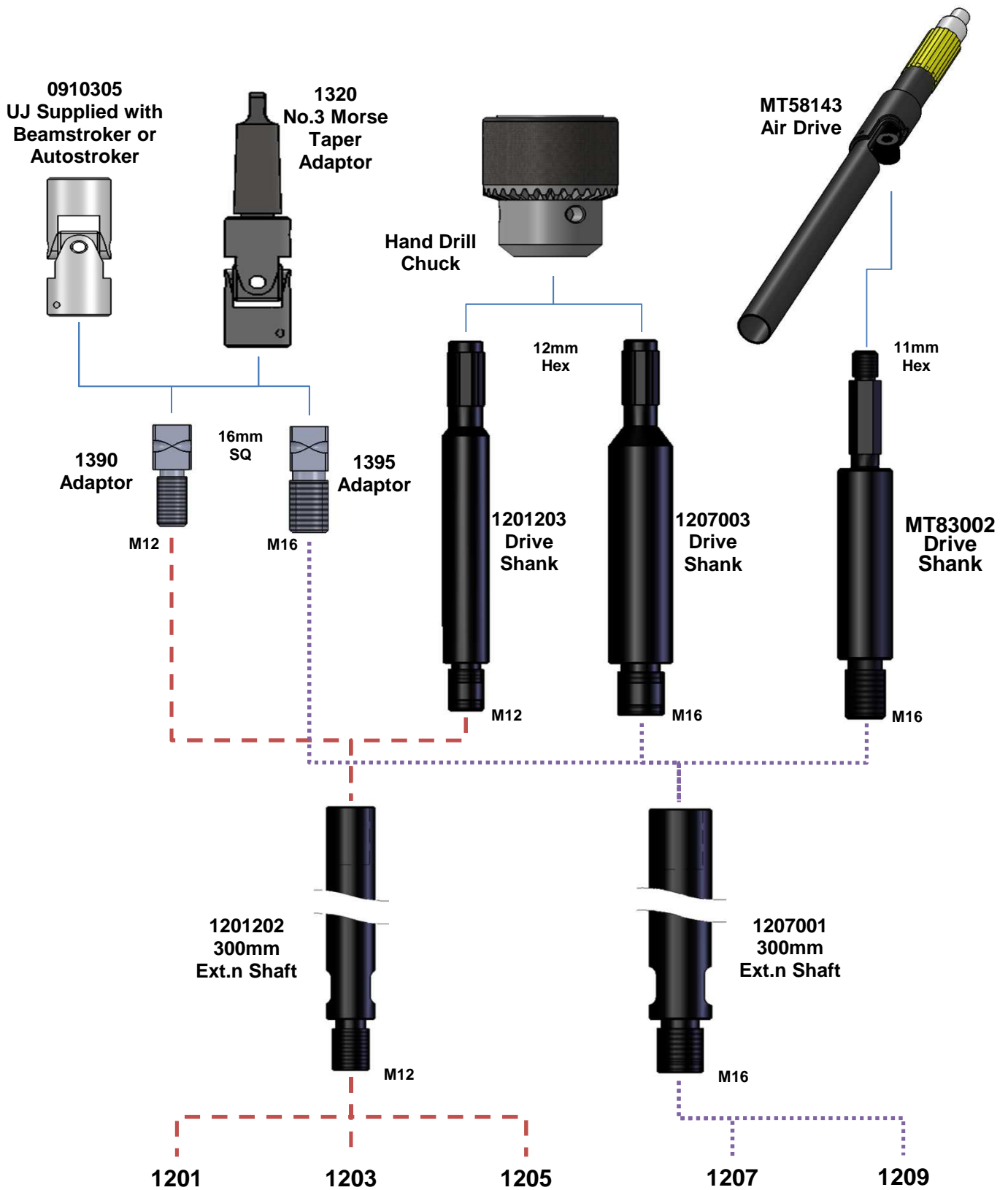
Note that when using HD stone sets the following diameter ranges apply ;

G	Ø78 - 108
M	Ø80 - 108

N	Ø99 - 140
PT	Ø103 - 140

Manual Driveshafts

As well as friction feed drive shafts, The Delapena vertical honing system can be used with borers, radial or pillar drills and portable power tools using Delapena's range of manual drive shafts.



Extension shafts can be added to increase overall length, however, driveshaft length can be manufactured to suit customer specific requirements.

Please contact Delapena.

Honing Fluids, Adaptors and Accessories

HONING FLUIDS (Code 25LEXTRA / 25LHD)

Delapena "Extra" honing fluid is a general purpose honing fluid.
Delapena "HD" honing fluid is suitable for horizontal tube hone applications, soft stainless steel and heavy duty honing applications.



HONING WITH DELAPENA MANDRELS (Code CG100 / CG100F)

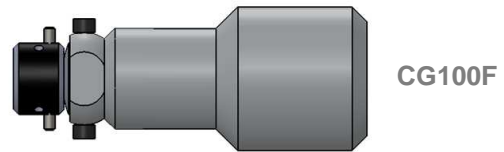
Delapena mandrel tools can be used with the vertical drive systems by using a "CG100" adaptor.
Note, that it is not recommended for diameters below $\varnothing 12\text{mm}$.

For manually adjusted applications the CG100 adaptor is supplied, enabling stone feed and pressure to be controlled via an adjuster nut. The CG 100 adaptor also has a drive shaft suitable for use with portable drills.



CG100

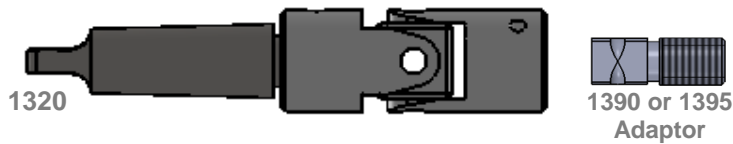
For friction feed applications the CG 100F adaptor uses the appropriate friction feed drive shaft for the standard head



CG100F

UNIVERSAL JOINTS FOR MANUALLY EXPANDED HONE HEADS (code 1320)

For fixed position power source operations a universal joint is required to compensate for potential errors in alignment between the drive and the bore. For this purpose the no.3 morse taper adaptor 1320, with friction feed or manual adjustment driveshafts, should be specified.



1320

1390 or 1395
Adaptor

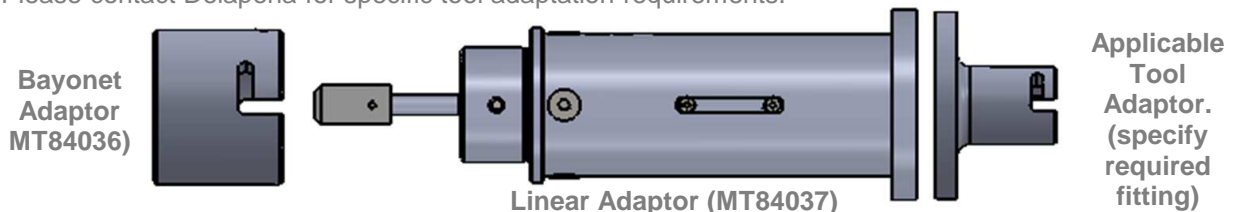
AIR DRIVE UNIT (Code MT58143)

Compressed air driven drive unit used for portable "on site" applications such as honing cylinders in situation where considerable time and cost would be involved to remove the cylinder. Use with manual adjustment drive shafts.



USING LINEAR EXPANDING TOOLS (Code MT84036 & MT84037)

Tooling with linear expanding mechanisms can be used with Delapena vertical drive systems by using a linear adaptor. This adaptor converts rotational expansion to linear expansion. With a variety of adaptors attached to the linear adaptor, any type of tool with linear expansion can be used. Please contact Delapena for specific tool adaptation requirements.



Bayonet
Adaptor
MT84036)

Linear Adaptor (MT84037)

Applicable
Tool
Adaptor.
(specify
required
fitting)

