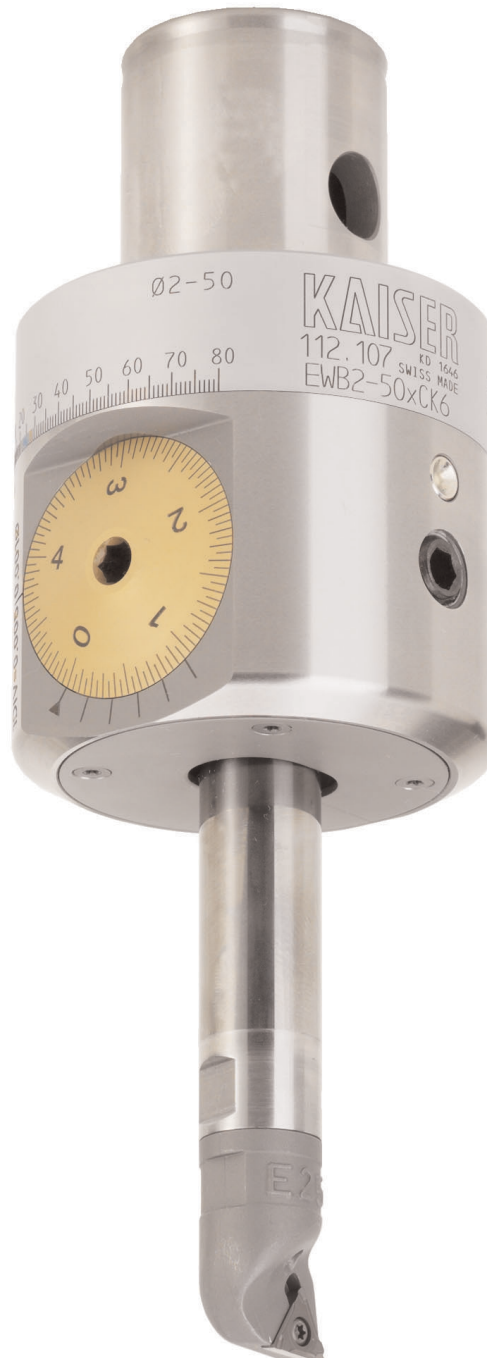


# Operating instruction

## Cutting data table

## Balancing data table



Single cutter boring head EWB 2 - 50 / Balanceable / Order No. **112.107**

### Order No. 112.107 / with integrated balancing system

The KAISER modular tooling and clamping systems are made by highly qualified expert craftsmen, using the most modern machinery available. During the course of manufacture, they are subjected to stringent and continuous methods of quality control. It is assumed the KAISER products will be used correctly and for the purposes for which they are intended and with due attention to the following advice, in order to achieve best possible results as regards swarf production capacity, accuracy, stability, safety and durability. The entire tool assembly must consist of original KAISER equipments.

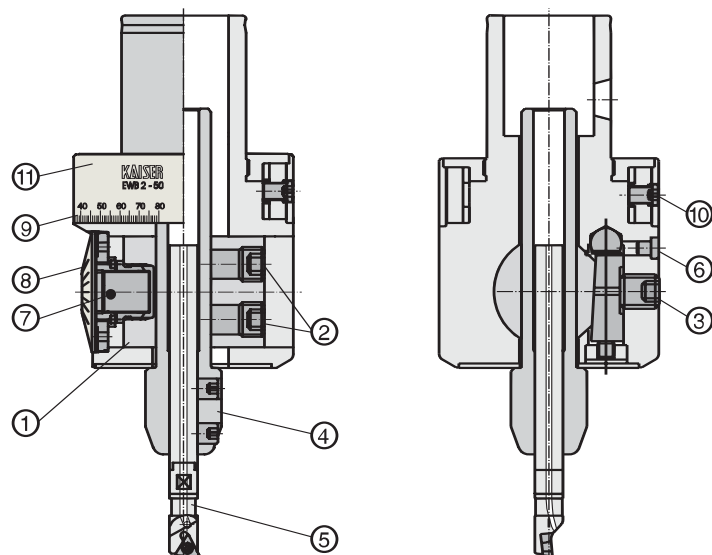
The correct setting of the boring heads is made in accordance with the operating instructions given below. All clamping and mounting screws must be properly tightened before start-up. Damaged screws must be replaced with original KAISER equipments. Incorrect or defective screws seriously reduce the work capacity and safety of the equipment.

For reasons of safety, the boring tools may only be used on machine tools having appropriate safety precautions against cuttings or parts which are thrown out. Depending on loading, all moving parts must be lubricated periodically, in normal use every 20 hours of operation.

Damaged tools must be returned for repair, in order to ensure their continuing precision and safety. This applies also after a collision, as examination may disclose internal damage, not visible without dismantling the unit. HEINZ KAISER rejects all liability, if resulting from improper use of its equipment. The scale division permits straightforward adjustment of the cut by less than 5 µm in the diameter. In addition, the boring head features an integrated balancing mechanism. The unbalance of the boring head is compensated for by a manually adjustable balancing ring.

#### Operating instruction

- Insert the cutting tool or tip holder (5), if necessary by using a reduction bush (4), into the tool hole of the carrier (1) at least as far as the two clamping screws (2) are engaged.
- Align the cutting edge by the mark on the face of the boring head and tighten the two screws (2).
- Locate the carrier (1) in the desired position by rotating the set screw (7) with the clamping screw (3) released. The scale disc (8) enables the change in diameter to read off accurately.  
(1 DIV = 0.005 mm in Ø)
- Tighten the clamping screw (3)



#### Balancing

- The following tables (pages 04 to 28) show how the balancing scale (9) can be set according to the tool combination and the boring diameter.
- Release the clamping screw (10).
- Set the balancing ring (11) to the table value (becoming greater from 0 upwards).
- Tighten the clamping screw (10).

#### Safety note

HEINZ KAISER AG can only guarantee faultless functioning and the safety of the tool if the following conditions are fulfilled:

- The largest possible indexable insert holder must always be used (the tool holder must stand as close to the centre as possible).
- The maximum cutting speeds stated in the tables may not be exceeded. They are dependent on the machining material, the boring diameter and the boring depth X. For each diameter range there is an appropriate page with cutting parameters and setting data for the balancing ring.
- Only accessories from the KAISER tool range may be used.

#### General Information

- HEINZ KAISER AG rejects all liability if tool components from third parties are used.
- Note that carrier travel is limited.
- Do NOT use force when adjusting.
- Periodic lubrication via the lube nipple (6) ensures high precision combined with long life. A light machine oil is recommended, e.g. Mobil Vactra Oil No. 2, BP Energol HLP-D32, Klueber Isoflex PDP 94.

### Boring range: ø 2.0 mm - ø 50 mm

#### Cutting data:

On the following pages, tables of recommended cutting speeds and feeds are provided. The values in these tables are the result of practical experience and specific trials. These tables are for average conditions and give users general information about using KAISER boring tools efficiently. Depending on working conditions, modifications of cutting speeds and feeds are required. The user must carefully monitor chip form and chip breaking during machining, and gain experience with each particular job.

In the tables are following signs and units employed:

Sign explanation	sign	unit
Cutting speed	Vc	[ m/min ]
Stock allowance (on diameter)	A (ø)	[ mm ]
Feed rate	f	[ mm/revolution ]
Insert - radius	R	[ mm ]
Surface finish (Ra max. 1.6 µm for N7)	Ra	[ µm ]
Diameter	d	[ mm ]
Speed	n	[ min <sup>-1</sup> ]

For calculation of the speed set the values from the tables into the following form:

$$n = \frac{Vc \cdot 1000}{d \cdot \pi}$$

#### Balancing system:

The EWB 2-50 boring head has an integrated balancing mechanism. The unbalance of the boring head is compensated for by a unique manually adjustable balancing ring.

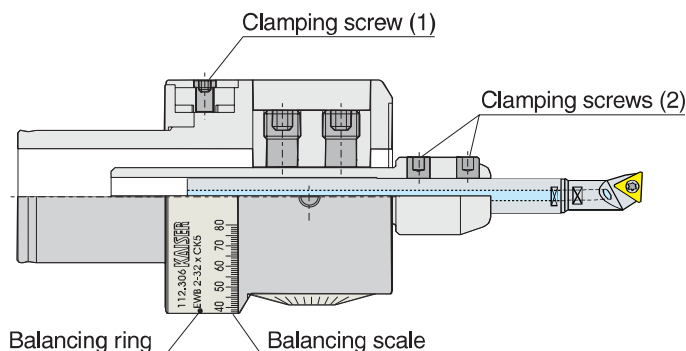
For each diameter range there is an appropriate page with cutting parameters and setting data for the balancing ring. The setting data are only applicable to the relevant tool combination illustrated, the use of other components would cause increased unbalance.

The setting data are dependent on the boring depth (long or short carbide bars), the machining diameter and the cutting radius of the insert.

#### The balancing ring is set as follows:

- Assemble tool combination appropriate to the diameter and the boring depth.
- Pre-set diameter.
- Obtain the setting for the balancing scale from the table.
- Release the clamping screw (1) on the balancing ring.
- Set the balancing ring to the table value.
- Important: always set from 0 becoming greater!
- Tighten the clamping screw (1).

When using reduction bushings care must be taken that the clamping screws (2) are always fitted in the cutting direction:



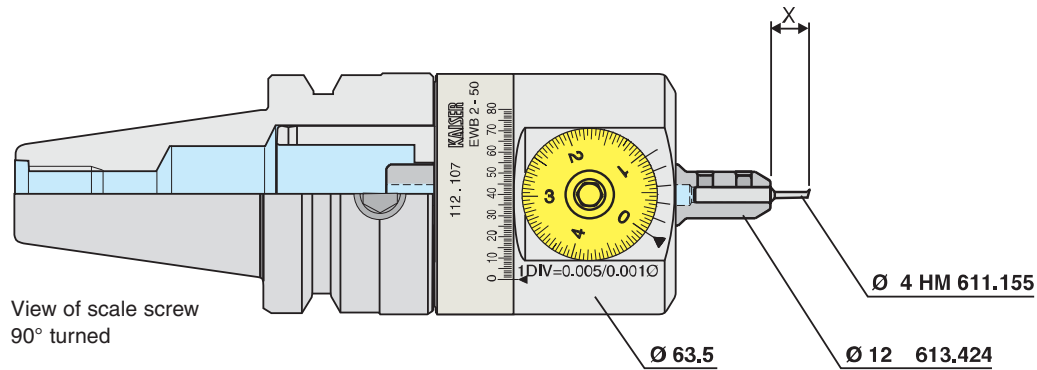
#### Example:

Boring diameter: ø 34.9  
 Tool combination: 615.227 / 615.285  
 Boring depth X: 100  
 Material: aluminium alloy  
 Insert from cutting parameter table  
 655.398 R 0.8  
 Setting balancing scale: 51

Boring ø	Setting of the balancing scale							
	615.227/615.285				615.229/615.285			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
34.8	41	42	45	50	49	51	54	62
34.9	42	43	46	51	50	52	56	63
35.0	43	44	46	52	52	53	57	65

#### Safety note

The maximum speed is dependent on the boring depth X and the tool combination. Therefore in the tables the maximum cutting speed is always stated in dependency on the boring depth. The maximum permissible speed for the relevant tool combination is calculated from the cutting speed according to the table for the aluminium materials group and the diameter to be machined.



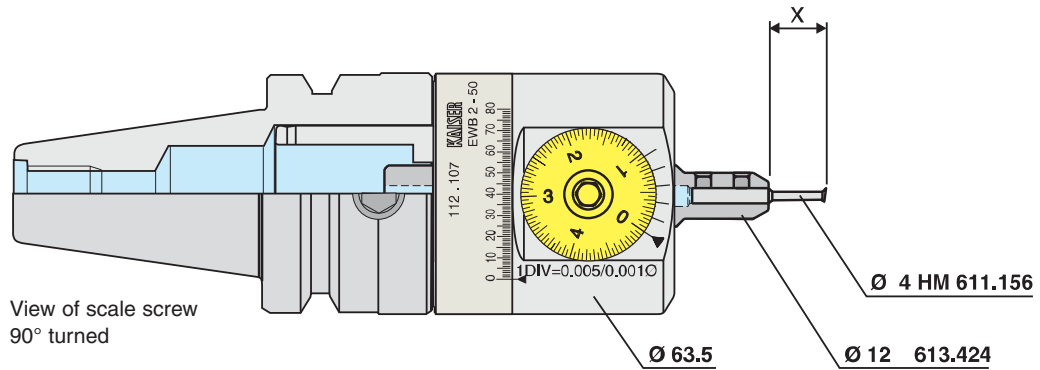
Material Group	Boring depth X	Cutting data Ø 2.0 - 3.0						
		Boring cutter		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel St37-2 St52-3 1.5752	max.9	611.155	0.1	90	0.10	0.20	0.04	0.08
Heat treatable steel Ck45 1.2312 1.2343 1.2083	max.9	611.155	0.1	80	0.10	0.20	0.04	0.08
Stainless-steel 1.4301 1.4435 1.2764 1.2767	max.9	611.155	0.1	70	0.10	0.20	0.04	0.08
Cast Iron	max.9	611.155	0.1	80	0.10	0.20	0.04	0.08
Aluminium Alloys	max.9	611.155	0.1	90	0.10	0.20	0.04	0.08

Boring Ø	Setting of the balancing scale					
	613.424/611.155					
	R 0.1	R 0.2				
2.0	12	13				
2.1	12	13				
2.2	13	14				
2.3	14	15				
2.4	15	15				
2.5	15	16				
2.6	16	17				
2.7	17	18				
2.8	17	18				
2.9	18	19				
3.0	19	20				

**Note:**

- Using the combination of toolholder 611.155 with reduction bushing 613.424.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 3.0 use the next tool combination (611.156/613.424, see next page).  
Wear safety goggles and use protective shields.



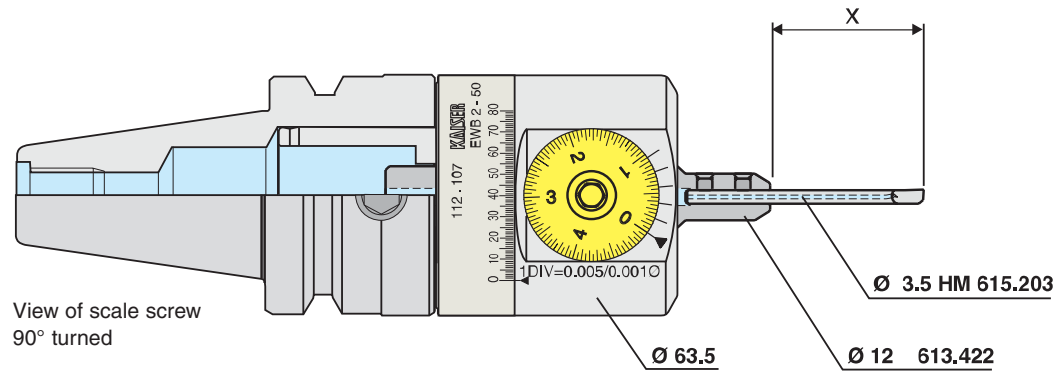
Material Group	Boring depth X	Cutting data Ø 3.0 - 4.0						
		Boring cutter		Vc	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R	[m/min]	Stand.	Max	Ra 1.6	Max.
Low carbon steel St37-2 St52-3 1.5752	max.14	611.156	0.1	100	0.10	0.20	0.04	0.08
Heat treatable steel Ck45 1.2312 1.2343 1.2083	max.14	611.156	0.1	80	0.10	0.20	0.04	0.08
Stainless-steel 1.4301 1.4435 1.2764 1.2767	max.14	611.156	0.1	70	0.10	0.20	0.04	0.08
Cast Iron	max.14	611.156	0.1	80	0.10	0.20	0.04	0.08
Aluminium Alloys	max.14	611.156	0.1	130	0.10	0.20	0.04	0.08

Boring Ø	Setting of the balancing scale					
	613.424/611.156					
	R 0.1	R 0.2				
3.0	12	13				
3.1	12	13				
3.2	13	14				
3.3	14	15				
3.4	14	15				
3.5	15	16				
3.6	16	17				
3.7	17	17				
3.8	17	18				
3.9	18	19				
4.0	19	20				

**Note:**

- Using the combination of toolholder 611.156 with reduction bushing 613.424.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 4.0 use the next tool combination (615.203/613.422, see next page).  
Wear safety goggles and use protective shields.



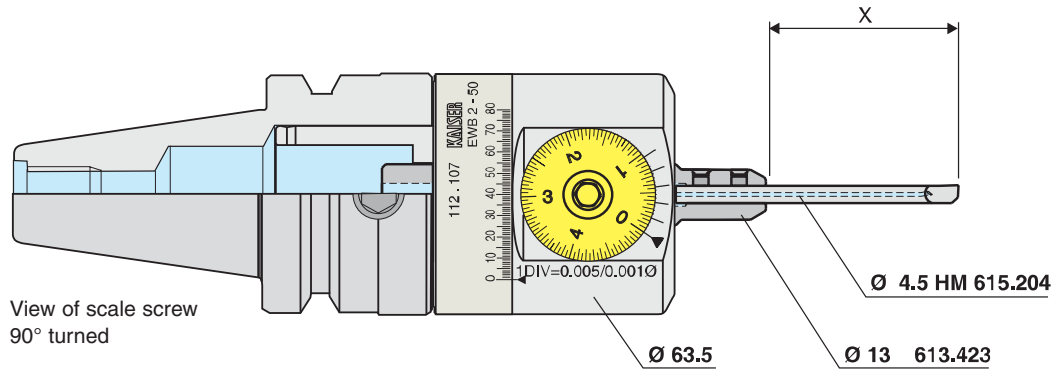
Material Group	Boring depth X	Cutting data Ø 3.9 - 4.9						
		Boring cutter		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel St37-2 St52-3 1.5752	10	615.203	0.1	130	0.15	0.30	0.04	0.08
	20	615.203	0.1	100	0.15	0.30	0.04	0.08
	30	615.203	0.1	70	0.15	0.30	0.04	0.08
	40	615.203	0.1	35	0.15	0.30	0.04	0.08
Heat treatable steel Ck45 1.2312 1.2343 1.2083	10	615.203	0.1	130	0.15	0.30	0.04	0.08
	20	615.203	0.1	100	0.15	0.30	0.04	0.08
	30	615.203	0.1	70	0.15	0.30	0.04	0.08
	40	615.203	0.1	35	0.15	0.30	0.04	0.08
Stainless-steel 1.4301 1.4435 1.2764 1.2767	10	615.203	0.1	130	0.15	0.30	0.04	0.08
	20	615.203	0.1	100	0.15	0.30	0.04	0.08
	30	615.203	0.1	70	0.15	0.30	0.04	0.08
	40	615.203	0.1	35	0.15	0.30	0.04	0.08
Cast Iron	10	615.203	0.1	130	0.15	0.30	0.04	0.08
	20	615.203	0.1	100	0.15	0.30	0.04	0.08
	30	615.203	0.1	70	0.15	0.30	0.04	0.08
	40	615.203	0.1	35	0.15	0.30	0.04	0.08
Aluminium Alloys	10	615.203	0.1	170	0.15	0.30	0.04	0.08
	20	615.203	0.1	90	0.15	0.30	0.04	0.08
	30	615.203	0.1	50	0.15	0.30	0.04	0.08
	40	615.203	0.1	15	0.15	0.30	0.04	0.08

Boring Ø	Setting of the balancing scale					
	613.422/615.203					
	R 0.1	R 0.2				
3.9	11	12				
4.0	12	13				
4.1	12	13				
4.2	13	14				
4.3	14	15				
4.4	14	15				
4.5	15	16				
4.6	16	17				
4.7	17	18				
4.8	17	18				
4.9	18	19				

**Note:**

- Using the combination of toolholder 615.203 with reduction bushing 613.422.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 4.9 use the next tool combination (615.204/613.423, see next page).  
Wear safety goggles and use protective shields.



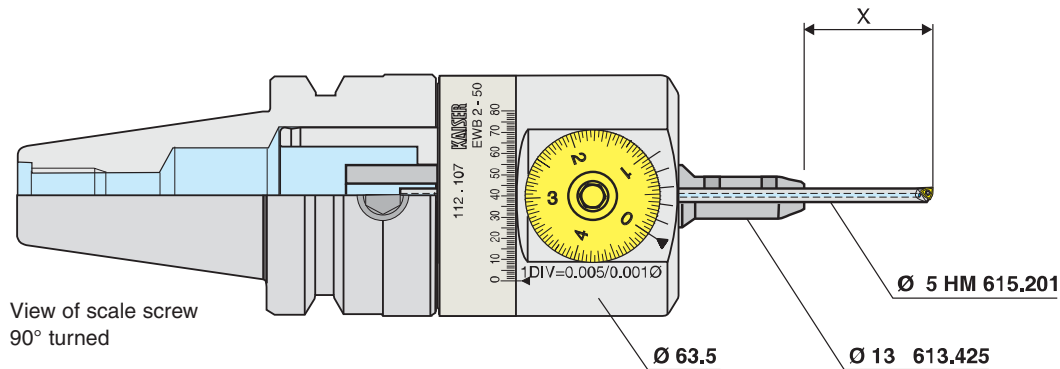
Material Group	Boring depth X	Cutting data Ø 4.9 - 5.9						
		Boring cutter		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	10	615.204	0.1	130	0.15	0.30	0.04	0.08
	20	615.204	0.1	100	0.15	0.30	0.04	0.08
	30	615.204	0.1	80	0.15	0.30	0.04	0.08
St37-2 St52-3 1.5752	40	615.204	0.1	65	0.15	0.30	0.04	0.08
	50	615.204	0.1	30	0.15	0.30	0.04	0.08
Heat treatable steel	10	615.204	0.1	130	0.15	0.30	0.04	0.08
	20	615.204	0.1	100	0.15	0.30	0.04	0.08
	30	615.204	0.1	80	0.15	0.30	0.04	0.08
Ck45 1.2312 1.2343 1.2083	40	615.204	0.1	65	0.15	0.30	0.04	0.08
	50	615.204	0.1	30	0.15	0.30	0.04	0.08
Stainless-steel	10	615.204	0.1	130	0.15	0.30	0.04	0.08
	20	615.204	0.1	100	0.15	0.30	0.04	0.08
	30	615.204	0.1	80	0.15	0.30	0.04	0.08
1.4301 1.4435 1.2764 1.2767	40	615.204	0.1	65	0.15	0.30	0.04	0.08
	50	615.204	0.1	30	0.15	0.30	0.04	0.08
Cast Iron	10	615.204	0.1	130	0.15	0.30	0.04	0.08
	20	615.204	0.1	100	0.15	0.30	0.04	0.08
	30	615.204	0.1	80	0.15	0.30	0.04	0.08
40	40	615.204	0.1	65	0.15	0.30	0.04	0.08
	50	615.204	0.1	30	0.15	0.30	0.04	0.08
Aluminium Alloys	10	615.204	0.1	220	0.15	0.30	0.04	0.08
	20	615.204	0.1	200	0.15	0.30	0.04	0.08
	30	615.204	0.1	150	0.15	0.30	0.04	0.08
40	40	615.204	0.1	90	0.15	0.30	0.04	0.08
	50	615.204	0.1	50	0.15	0.30	0.04	0.08

Boring Ø	Setting of the balancing scale					
	613.423/615.204					
	R 0.1	R 0.2				
4.9	11	12				
5.0	11	12				
5.1	12	13				
5.2	13	14				
5.3	14	15				
5.4	14	15				
5.5	15	16				
5.6	16	17				
5.7	17	18				
5.8	17	18				
5.9	18	19				

**Note:**

- Using the combination of toolholder 615.204 with reduction bushing 613.423.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 5.9 use the next tool combination (615.201/613.425, see next page). Wear safety goggles and use protective shields.



Material Group	Boring depth X	Cutting data Ø 5.8 - 7.3							
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]		
		Order No.	R		Stand.	Max	Ra 1.6	Max.	
Low carbon steel	10	655.602	0.2	130	0.20	0.60	0.06	0.10	
	20	655.602	0.2	100	0.20	0.60	0.06	0.10	
	30	655.602	0.2	90	0.20	0.50	0.06	0.09	
	St37-2	40	655.606	0.1	70	0.20	0.50	0.04	0.07
	St52-3	50	655.606	0.1	50	0.20	0.50	0.04	0.07
	1.5752	60	655.606	0.1	30	0.20	0.40	0.04	0.07
Heat treatable steel	10	655.602	0.2	130	0.20	0.60	0.06	0.09	
	20	655.602	0.2	100	0.20	0.60	0.06	0.09	
	30	655.602	0.2	90	0.20	0.50	0.06	0.08	
	Ck45	40	655.606	0.1	70	0.20	0.50	0.04	0.07
	1.2312	50	655.606	0.1	50	0.20	0.50	0.04	0.07
	1.2343 1.2083	60	655.606	0.1	30	0.20	0.40	0.04	0.07
Stainless-steel	10	655.602	0.2	130	0.20	0.50	0.06	0.08	
	20	655.602	0.2	100	0.20	0.50	0.06	0.08	
	30	655.602	0.2	90	0.20	0.50	0.06	0.08	
	1.4301	40	655.606	0.1	70	0.20	0.50	0.04	0.06
	1.4435	50	655.606	0.1	50	0.20	0.40	0.04	0.06
	1.2764 1.2767	60	655.606	0.1	30	0.20	0.40	0.04	0.06
Cast Iron	10	655.603	0.2	130	0.20	0.60	0.06	0.11	
	20	655.603	0.2	100	0.20	0.60	0.06	0.11	
	30	655.603	0.2	90	0.20	0.60	0.06	0.10	
	40	655.605	0.1	70	0.20	0.60	0.04	0.07	
	50	655.605	0.1	50	0.20	0.50	0.04	0.07	
	60	655.605	0.1	30	0.20	0.40	0.04	0.07	
Aluminium Alloys	10	655.601	0.2	250	0.20	0.70	0.06	0.12	
	20	655.601	0.2	200	0.20	0.70	0.06	0.12	
	30	655.601	0.2	150	0.20	0.70	0.06	0.11	
	40	655.601	0.2	120	0.20	0.70	0.06	0.10	
	50	655.604	0.1	85	0.20	0.60	0.04	0.08	
	60	655.604	0.1	50	0.20	0.50	0.04	0.08	

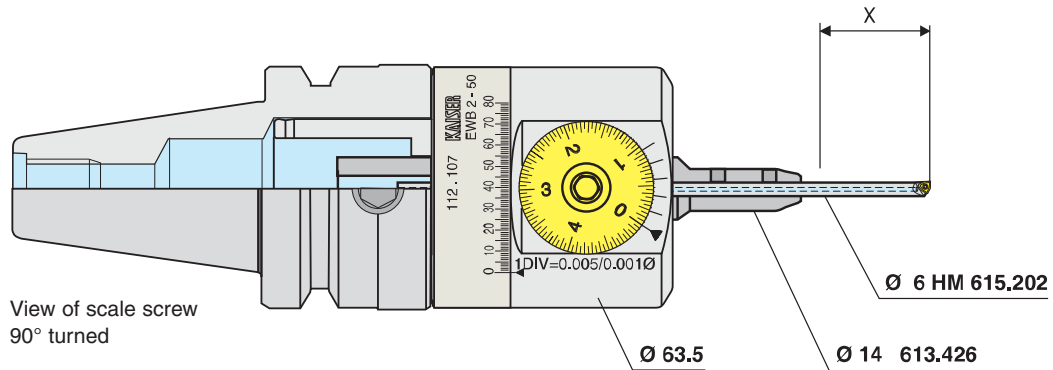
Boring Ø	Setting of the balancing scale							
	613.425/615.201							
	R 0.1	R 0.2	R 0.3	R 0.4				
5.8	12	13	14	15				
5.9	12	13	14	15				
6.0	13	14	15	16				
6.1	14	15	16	17				
6.2	15	16	17	18				
6.3	15	16	17	18				
6.4	16	17	18	19				
6.5	17	18	19	20				
6.6	18	19	20	21				
6.7	18	19	20	21				
6.8	19	20	21	22				
6.9	20	21	22	23				
7.0	20	21	22	23				
7.1	21	22	23	24				
7.2	22	23	24	25				
7.3	23	24	24	25				
7.4	23	24	25	26				
7.5	24	25	26	27				
7.6	25	26	27	27				
7.7	25	26	27	28				
7.8	26	27	28	29				

**Note:**

- Using the combination of toolholder 615.201 with reduction bushing 613.425.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 7.3 use the next tool combination (615.202/613.426, see next page). Wear safety goggles and use protective shields.





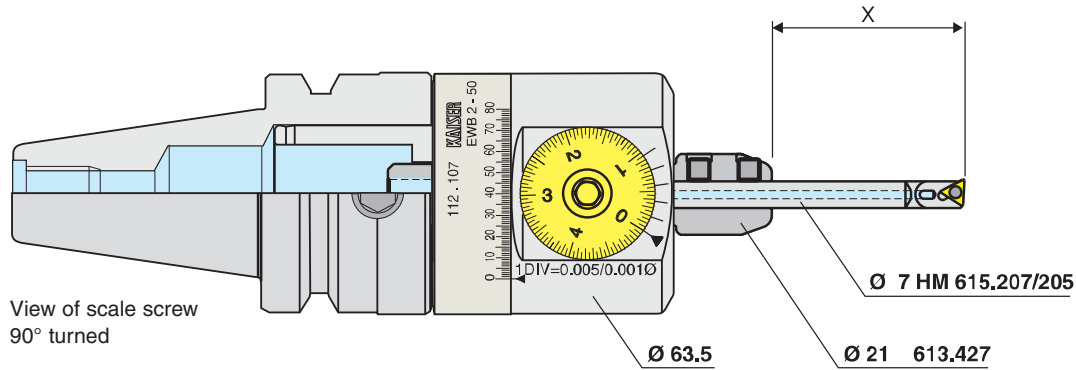
Material Group	Boring depth X	Cutting data Ø 7.3 - 8.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	10	655.602	0.2	140	0.20	0.60	0.06	0.10
	20	655.602	0.2	120	0.20	0.60	0.06	0.10
	30	655.602	0.2	100	0.20	0.60	0.06	0.09
	40	655.602	0.2	85	0.20	0.60	0.06	0.09
	50	655.606	0.1	65	0.20	0.50	0.04	0.07
1.5752	65	655.606	0.1	35	0.20	0.40	0.04	0.07
Heat treatable steel	10	655.602	0.2	140	0.20	0.60	0.06	0.09
	20	655.602	0.2	120	0.20	0.60	0.06	0.09
	30	655.602	0.2	100	0.20	0.60	0.06	0.08
	40	655.602	0.2	85	0.20	0.60	0.06	0.08
	50	655.606	0.1	65	0.20	0.50	0.04	0.07
Ck45 1.2312 1.2343 1.2083	65	655.606	0.1	35	0.20	0.40	0.04	0.07
Stainless-steel	10	655.602	0.2	140	0.20	0.50	0.06	0.08
	20	655.602	0.2	120	0.20	0.50	0.06	0.08
	30	655.602	0.2	100	0.20	0.50	0.06	0.08
	40	655.602	0.2	85	0.20	0.40	0.06	0.08
	50	655.606	0.1	65	0.20	0.40	0.04	0.06
1.4301 1.4435 1.2764 1.2767	65	655.606	0.1	35	0.20	0.40	0.04	0.06
Cast Iron	10	655.602	0.2	140	0.20	0.60	0.06	0.11
	20	655.602	0.2	120	0.20	0.60	0.06	0.11
	30	655.602	0.2	100	0.20	0.60	0.06	0.10
	40	655.605	0.2	85	0.20	0.60	0.06	0.10
	50	655.605	0.1	65	0.20	0.50	0.04	0.07
65	655.605	0.1	35	0.20	0.40	0.04	0.07	
Aluminium Alloys	10	655.601	0.2	320	0.20	0.70	0.06	0.12
	20	655.601	0.2	250	0.20	0.70	0.06	0.12
	30	655.601	0.2	170	0.20	0.70	0.06	0.12
	40	655.601	0.2	140	0.20	0.60	0.06	0.11
	50	655.601	0.2	100	0.20	0.60	0.06	0.10
65	655.604	0.1	60	0.20	0.50	0.04	0.08	

Boring Ø	Setting of the balancing scale 613.426/615.202				R 0.1	R 0.2	R 0.3	R 0.4
	R 0.1	R 0.2	R 0.3	R 0.4				
	7.3	11	13	14				
7.4	12	13	14	15				
7.5	13	14	15	16				
7.6	14	15	16	17				
7.7	15	16	17	18				
7.8	15	16	17	18				
7.9	16	17	18	19				
8.0	17	18	19	20				
8.1	18	19	20	21				
8.2	18	19	20	21				
8.3	19	20	21	22				
8.4	20	21	22	23				
8.5	21	22	23	24				
8.6	21	22	23	24				
8.7	22	23	24	25				
8.8	23	24	25	26				
8.9	23	24	25	26				
9.0	24	25	26	27				
9.1	25	26	27	28				
9.2	26	27	27	28				
9.3	26	27	28	29				

**Note:**

- Using the combination of toolholder 615.202 with reduction bushing 613.426.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 8.8 use the next tool combination (615.212/615.227/615.271/613.428, see page 11). Wear safety goggles and use protective shields.



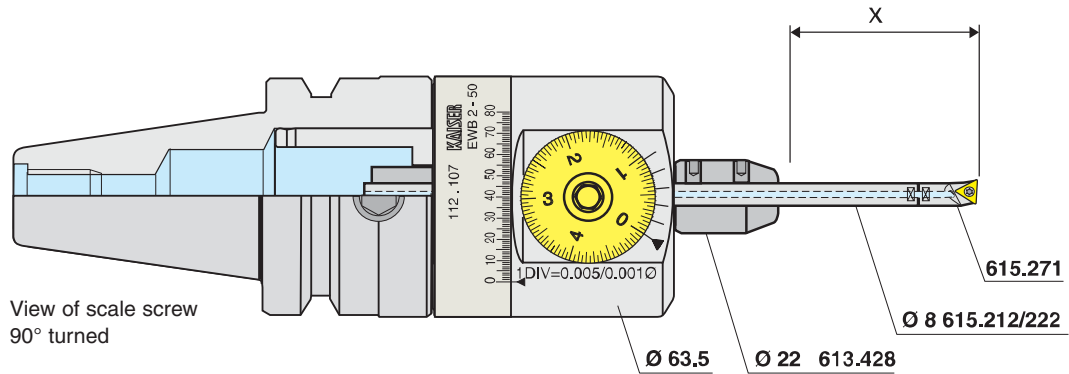
Material Group	Boring depth X	Cutting data Ø 7.8 - 9.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	30	651.738	0.3	130	0.20	0.80	0.08	0.12
	40	651.838	0.2	110	0.20	0.70	0.06	0.11
	50	651.838	0.2	90	0.20	0.60	0.06	0.09
	60	651.824	0.1	70	0.20	0.50	0.04	0.08
	70	651.824	0.1	45	0.20	0.40	0.04	0.08
1.5752	85	651.824	0.1	20	0.20	0.40	0.04	0.07
Heat treatable steel	30	651.737	0.3	130	0.20	0.80	0.08	0.12
	40	651.837	0.2	110	0.20	0.70	0.06	0.11
	50	651.837	0.2	90	0.20	0.60	0.06	0.09
	60	651.824	0.1	70	0.20	0.50	0.04	0.08
	70	651.824	0.1	45	0.20	0.40	0.04	0.08
1.2312 1.2343 1.2083	85	651.824	0.1	20	0.20	0.40	0.04	0.07
Stainless-steel	30	651.737	0.3	130	0.20	0.80	0.08	0.12
	40	651.837	0.2	110	0.20	0.70	0.06	0.11
	50	651.837	0.2	90	0.20	0.60	0.06	0.09
	60	651.824	0.1	70	0.20	0.50	0.04	0.08
	70	651.824	0.1	45	0.20	0.40	0.04	0.08
1.4301 1.4435 1.2764 1.2767	85	651.824	0.1	20	0.20	0.40	0.04	0.07
Cast Iron	30	651.735	0.3	130	0.20	0.80	0.08	0.12
	40	651.735	0.3	110	0.20	0.70	0.06	0.11
	50	651.834	0.2	90	0.20	0.60	0.06	0.09
	60	651.834	0.2	70	0.20	0.50	0.04	0.08
	70	651.824	0.1	45	0.20	0.40	0.04	0.08
85	651.824	0.1	20	0.20	0.40	0.04	0.07	
Aluminium Alloys	30	651.723	0.3	340	0.20	0.80	0.08	0.12
	40	651.735	0.3	250	0.20	0.70	0.08	0.11
	50	651.823	0.1	150	0.20	0.60	0.04	0.08
	60	651.823	0.1	115	0.20	0.50	0.04	0.08
	70	651.823	0.1	75	0.20	0.40	0.04	0.08
85	651.823	0.1	30	0.20	0.40	0.04	0.07	

Boring Ø	Setting of the balancing scale							
	613.427/615.207				613.427/615.205			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
7.8	9	10	11	12	8	10	11	12
7.9	9	11	12	13	9	10	12	13
8.0	10	11	13	14	10	11	13	14
8.1	11	12	13	15	11	12	13	15
8.2	12	13	14	15	12	13	14	15
8.3	13	14	15	16	13	14	15	16
8.4	14	15	16	17	14	15	16	17
8.5	14	16	17	18	15	16	17	18
8.6	15	16	17	19	15	17	18	19
8.7	16	17	18	19	16	17	19	20
8.8	17	18	19	20	17	18	19	20
8.9	18	19	20	21	18	19	20	21
9.0	18	20	21	22	19	20	21	22
9.1	19	20	21	22	20	21	22	23
9.2	20	21	22	23	20	21	23	24
9.3	21	22	23	24	21	22	23	24
9.4	22	23	24	25	22	23	24	25
9.5	22	23	24	25	23	24	25	26
9.6	23	24	25	26	24	25	26	27
9.7	24	25	26	27	24	25	27	28
9.8	25	26	27	28	25	26	27	28

**Note:**

- Using the combination of toolholder 615.207 or 615.205 with reduction bushing 613.427.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 9.8 use the next tool combination (615.208/615.206/613.429, see page 12). Wear safety goggles and use protective shields.



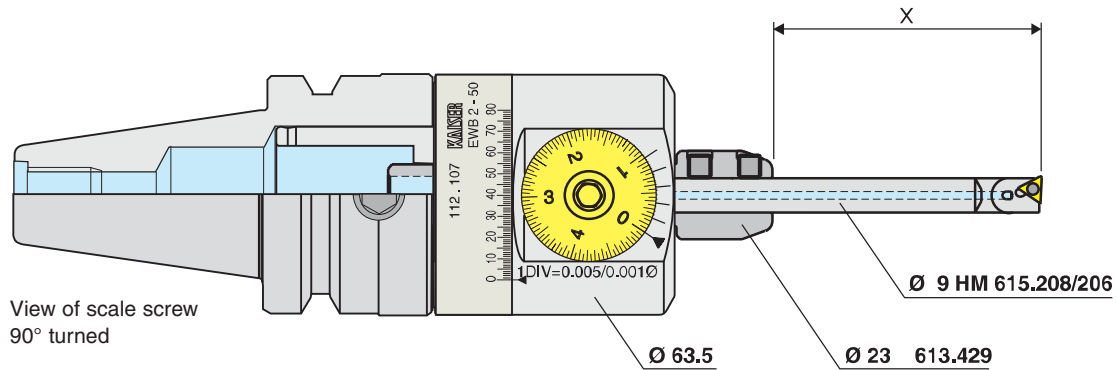
Material Group	Boring depth X	Cutting data Ø 8.8 - 11.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	30	651.738	0.3	150	0.25	0.90	0.08	0.15
	40	651.838	0.2	110	0.20	0.80	0.06	0.12
	50	651.838	0.2	90	0.20	0.60	0.06	0.10
	60	651.838	0.2	70	0.20	0.50	0.06	0.09
St37-2	75	651.824	0.1	45	0.20	0.40	0.04	0.07
Heat treatable steel	30	651.737	0.3	150	0.25	0.90	0.08	0.14
	40	651.837	0.2	110	0.20	0.80	0.06	0.11
	50	651.837	0.2	90	0.20	0.60	0.06	0.09
	60	651.837	0.2	70	0.20	0.60	0.06	0.08
Ck45	75	651.824	0.1	45	0.20	0.50	0.04	0.06
Stainless-steel	30	651.737	0.3	150	0.25	0.70	0.08	0.11
	40	651.837	0.2	110	0.25	0.60	0.06	0.11
	50	651.837	0.2	90	0.25	0.60	0.06	0.10
	60	651.837	0.2	70	0.25	0.40	0.06	0.08
1.4301	75	651.824	0.1	45	0.20	0.40	0.04	0.06
Cast Iron	30	651.735	0.3	150	0.25	1.00	0.08	0.14
	40	651.735	0.2	110	0.25	0.70	0.08	0.12
	50	651.735	0.2	90	0.25	0.50	0.08	0.10
	60	651.834	0.2	70	0.25	0.50	0.06	0.09
75	651.824	0.1	45	0.20	0.50	0.04	0.07	
Aluminium Alloys	30	651.723	0.3	380	0.25	1.00	0.08	0.16
	40	651.723	0.3	250	0.25	0.90	0.08	0.15
	50	651.723	0.3	150	0.25	0.80	0.08	0.12
	60	651.723	0.3	115	0.25	0.70	0.08	0.10
75	651.823	0.1	70	0.20	0.50	0.04	0.08	

Boring Ø	Setting of the balancing scale							
	613.428/615.212/615.271				613.428/615.222/615.271			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
8.8	9	10	11	13	9	10	11	13
8.9	10	11	12	13	10	11	12	13
9.0	11	12	13	14	11	12	13	14
9.1	12	13	14	15	12	13	14	15
9.2	12	14	15	16	13	14	15	16
9.3	13	14	16	17	13	15	16	17
9.4	14	15	16	18	14	15	17	18
9.5	15	16	17	18	15	16	17	19
9.6	16	17	18	19	16	17	18	19
9.7	17	18	19	20	17	18	19	20
9.8	17	19	20	21	18	19	20	21
9.9	18	19	20	21	18	20	21	22
10.0	19	20	21	22	19	20	22	23
10.1	20	21	22	23	20	21	22	23
10.2	21	22	23	24	21	22	23	24
10.3	21	22	24	25	22	23	24	25
10.4	22	23	24	25	23	24	25	26
10.5	23	24	25	26	23	24	25	27
10.6	24	25	26	27	24	25	26	27
10.7	25	26	27	28	25	26	27	28
10.8	25	26	27	28	26	27	28	29
10.9	26	27	28	29	26	28	29	30
11.0	27	28	29	30	27	28	29	30
11.1	28	29	30	31	28	29	30	31
11.2	28	29	30	31	29	30	31	32
11.3	29	30	31	32	30	31	32	33
11.4	30	31	32	33	30	31	32	33
11.5	31	32	33	34	31	32	33	34
11.6	31	32	33	34	32	33	34	35
11.7	32	33	34	35	33	34	35	36
11.8	33	34	35	36	33	34	35	37

**Note:**

- Using the combination of toolholder 615.271 with 615.212 or 615.222 and reduction bushing 613.428.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 11.8 use the next tool combination (615.215/615.223/615.272/613.430, see page 13). Wear safety goggles and use protective shields.



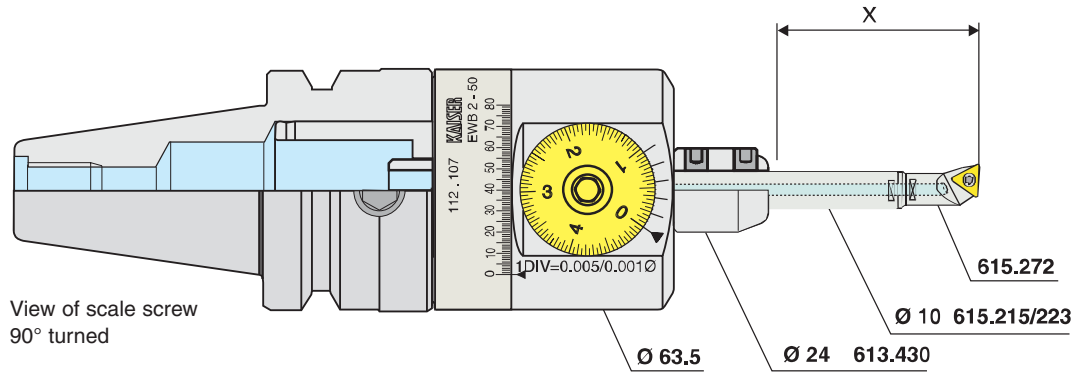
Material Group	Boring depth X	Cutting data Ø 9.8 - 11.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	30	651.738	0.3	180	0.25	1.00	0.08	0.15
	40	651.738	0.3	160	0.25	0.80	0.08	0.12
	50	651.738	0.3	115	0.25	0.80	0.08	0.10
	60	651.838	0.2	95	0.20	0.60	0.06	0.09
	70	651.838	0.2	70	0.20	0.60	0.06	0.09
St37-2 St52-3 1.5752	85	651.824	0.1	45	0.20	0.50	0.04	0.07
	100	651.824	0.1	20	0.20	0.40	0.04	0.07
	30	651.737	0.3	180	0.25	1.00	0.10	0.15
Heat treatable steel	40	651.737	0.3	160	0.25	0.80	0.08	0.12
	50	651.737	0.3	115	0.25	0.80	0.08	0.10
	60	651.837	0.2	95	0.20	0.60	0.06	0.09
	70	651.837	0.2	70	0.20	0.60	0.06	0.09
	85	651.824	0.1	45	0.20	0.50	0.04	0.07
Ck45 1.2312 1.2343 1.2083	100	651.824	0.1	20	0.20	0.40	0.04	0.07
	30	651.737	0.3	180	0.25	0.80	0.08	0.12
	40	651.737	0.3	160	0.25	0.80	0.08	0.12
Stainless-steel	50	651.737	0.3	115	0.25	0.80	0.08	0.10
	60	651.834	0.2	95	0.20	0.60	0.06	0.09
	70	651.834	0.2	70	0.20	0.60	0.06	0.09
	85	651.824	0.1	45	0.20	0.50	0.04	0.07
	100	651.824	0.1	20	0.20	0.40	0.04	0.07
1.4301 1.4435 1.2764 1.2767	30	651.735	0.3	180	0.25	1.00	0.10	0.15
	40	651.735	0.3	160	0.25	0.80	0.08	0.12
	50	651.735	0.3	115	0.25	0.80	0.08	0.10
	60	651.834	0.2	95	0.20	0.60	0.06	0.09
	70	651.834	0.2	70	0.20	0.60	0.06	0.09
Cast Iron	85	651.824	0.1	45	0.20	0.50	0.04	0.07
	100	651.824	0.1	20	0.20	0.40	0.04	0.07
	30	651.723	0.3	420	0.25	1.00	0.08	0.15
Aluminium Alloys	40	651.723	0.3	230	0.25	0.80	0.08	0.12
	50	651.723	0.3	220	0.25	0.80	0.08	0.10
	60	651.723	0.3	160	0.20	0.60	0.08	0.10
	70	651.723	0.3	115	0.20	0.60	0.08	0.10
	85	651.823	0.1	70	0.20	0.50	0.04	0.07
	100	651.823	0.1	30	0.20	0.40	0.04	0.07

Boring Ø	Setting of the balancing scale							
	613.429/615.208				613.429/615.206			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
9.8	8	9	10	12	7	9	10	11
9.9	9	10	11	12	8	10	11	12
10.0	10	11	12	13	9	11	12	13
10.1	11	12	13	14	10	12	13	14
10.2	11	13	14	15	11	13	14	15
10.3	12	14	15	16	12	14	15	16
10.4	13	14	16	17	13	15	16	17
10.5	14	15	16	18	14	16	17	18
10.6	15	16	17	18	15	17	18	19
10.7	16	17	18	19	16	17	19	20
10.8	17	18	19	20	17	18	20	21
10.9	18	19	20	21	18	19	20	22
11.0	18	20	21	22	19	20	21	23
11.1	19	20	21	23	20	21	22	23
11.2	20	21	22	23	21	22	23	24
11.3	21	22	23	24	22	23	24	25
11.4	22	23	24	25	23	24	25	26
11.5	23	24	25	26	23	25	26	27
11.6	23	24	26	27	24	25	27	28
11.7	24	25	26	27	25	26	27	29
11.8	25	26	27	28	26	27	28	29

**Note:**

- Using the combination of toolholder 615.208 or 615.206 with reduction bushing 613.429.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 11.8 use the next tool combination (615.272/615.215/615.223/613.430, see next page). Wear safety goggles and use protective shields.



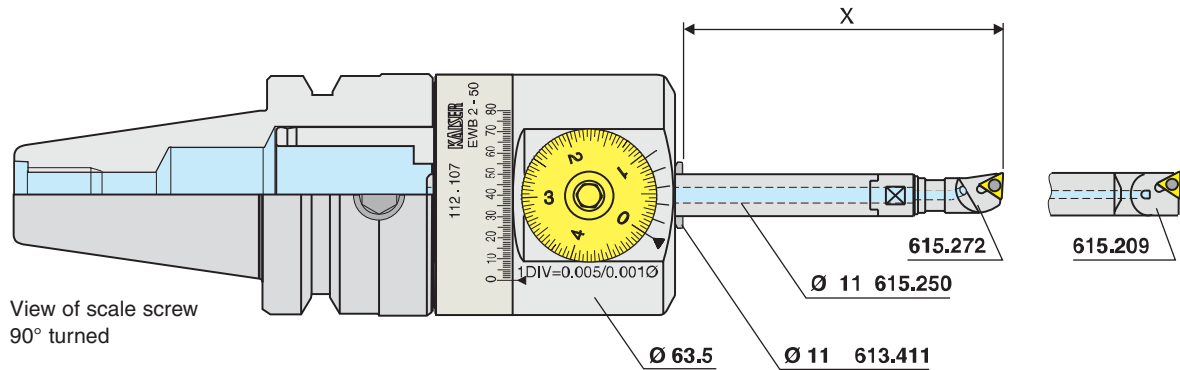
Material Group	Boring depth X	Cutting data Ø 11.8 - 13.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	30	651.738	0.3	200	0.25	1.20	0.08	0.15
	45	651.738	0.3	140	0.25	0.80	0.08	0.14
	60	651.838	0.2	110	0.20	0.60	0.06	0.10
	75	651.838	0.2	70	0.20	0.60	0.06	0.09
	90	651.824	0.1	45	0.20	0.50	0.04	0.07
Heat treatable steel	30	651.737	0.3	200	0.25	1.20	0.08	0.14
	45	651.737	0.3	140	0.25	0.80	0.08	0.12
	60	651.837	0.2	110	0.20	0.60	0.06	0.09
	75	651.837	0.2	70	0.20	0.60	0.06	0.08
	90	651.824	0.1	45	0.20	0.50	0.04	0.06
Stainless-steel	30	651.737	0.3	200	0.25	0.70	0.08	0.14
	45	651.737	0.3	140	0.25	0.60	0.08	0.12
	60	651.837	0.2	110	0.25	0.50	0.06	0.10
	75	651.837	0.2	70	0.25	0.50	0.06	0.07
	90	651.824	0.1	45	0.20	0.40	0.04	0.06
Cast Iron	30	651.735	0.3	200	0.25	1.10	0.08	0.14
	45	651.735	0.3	140	0.25	0.90	0.08	0.14
	60	651.735	0.3	110	0.25	0.80	0.08	0.12
	75	651.834	0.2	70	0.25	0.60	0.04	0.08
	90	651.824	0.1	45	0.20	0.60	0.04	0.08
Aluminium Alloys	30	651.723	0.3	500	0.25	1.10	0.08	0.16
	45	651.723	0.3	300	0.25	0.90	0.08	0.14
	60	651.723	0.3	180	0.25	0.80	0.08	0.12
	75	651.723	0.3	120	0.25	0.70	0.08	0.10
	90	651.823	0.1	75	0.20	0.60	0.04	0.09

Boring Ø	Setting of the balancing scale							
	613.430/615.215/615.272				613.430/615.223/615.272			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
11.8	10	12	13	14	10	12	13	14
11.9	11	13	14	15	11	13	14	15
12.0	12	13	15	16	12	14	15	16
12.1	13	14	16	17	13	15	16	17
12.2	14	15	16	18	14	15	17	18
12.3	15	16	17	19	15	16	18	19
12.4	16	17	18	19	16	17	19	20
12.5	17	18	19	20	17	18	19	21
12.6	18	19	20	21	18	19	20	22
12.7	18	20	21	22	19	20	21	22
12.8	19	20	22	23	20	21	22	23
12.9	20	21	22	24	21	22	23	24
13.0	21	22	23	24	21	23	24	25
13.1	22	23	24	25	22	24	25	26
13.2	23	24	25	26	23	24	26	27
13.3	24	25	26	27	24	25	26	28
13.4	24	26	27	28	25	26	27	28
13.5	25	26	27	29	26	27	28	29
13.6	26	27	28	29	27	28	29	30
13.7	27	28	29	30	28	29	30	31
13.8	28	29	30	31	28	30	31	32

**Note:**

- Using the combination of toolholder 615.272 with 615.215 or 615.223 and reduction bushing 613.430.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 13.8 use the next tool combination (615.273/615.251/615.210/613.413, see page 16). Wear safety goggles and use protective shields.



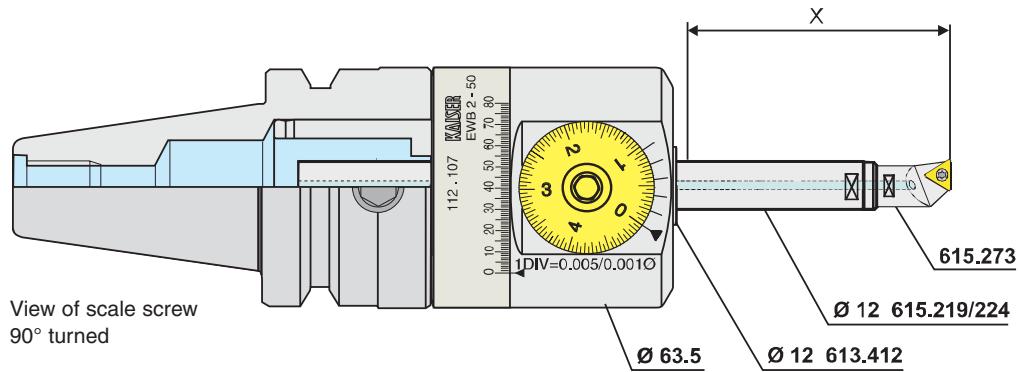
Material Group	Boring depth X	Cutting data Ø 11.8 - 13.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	30	651.738	0.3	240	0.25	0.90	0.08	0.18
	45	651.738	0.3	210	0.25	0.90	0.08	0.16
	60	651.738	0.3	150	0.20	0.70	0.08	0.12
	75	651.838	0.2	120	0.20	0.70	0.06	0.11
	90	651.838	0.2	85	0.20	0.60	0.06	0.11
	105	651.824	0.1	55	0.20	0.50	0.04	0.07
1.5752	120	651.824	0.1	20	0.20	0.40	0.04	0.06
Heat treatable steel	30	651.737	0.3	230	0.25	0.90	0.08	0.15
	45	651.737	0.3	200	0.25	0.90	0.08	0.15
	60	651.737	0.3	150	0.20	0.70	0.08	0.11
	75	651.837	0.2	120	0.20	0.70	0.06	0.10
	90	651.837	0.2	85	0.20	0.60	0.06	0.10
	105	651.824	0.1	55	0.20	0.50	0.04	0.07
1.2312	120	651.824	0.1	20	0.20	0.40	0.04	0.06
Ck45	30	651.737	0.3	230	0.25	0.90	0.08	0.14
	45	651.737	0.3	200	0.20	0.80	0.08	0.14
	60	651.737	0.3	150	0.20	0.70	0.08	0.11
	75	651.837	0.2	120	0.20	0.70	0.06	0.09
	90	651.837	0.2	85	0.20	0.60	0.06	0.09
	105	651.824	0.1	55	0.20	0.50	0.04	0.06
1.2764	120	651.824	0.1	20	0.20	0.40	0.04	0.06
Stainless-steel	30	651.737	0.3	230	0.25	0.90	0.08	0.14
	45	651.737	0.3	200	0.20	0.80	0.08	0.14
	60	651.737	0.3	150	0.20	0.70	0.08	0.11
	75	651.837	0.2	120	0.20	0.70	0.06	0.09
	90	651.837	0.2	85	0.20	0.60	0.06	0.09
	105	651.824	0.1	55	0.20	0.50	0.04	0.06
1.2767	120	651.824	0.1	20	0.20	0.40	0.04	0.06
Cast Iron	30	651.734	0.4	230	0.25	0.90	0.10	0.18
	45	651.734	0.4	200	0.25	0.90	0.10	0.16
	60	651.735	0.3	150	0.20	0.70	0.06	0.12
	75	651.834	0.2	120	0.20	0.70	0.06	0.11
	90	651.834	0.2	85	0.20	0.60	0.06	0.11
	105	651.824	0.1	55	0.20	0.50	0.04	0.07
120	651.824	0.1	20	0.20	0.40	0.04	0.06	
Aluminium Alloys	30	651.723	0.3	500	0.25	0.90	0.08	0.16
	45	651.723	0.3	315	0.25	0.90	0.08	0.16
	60	651.723	0.3	250	0.20	0.70	0.08	0.12
	75	651.723	0.3	180	0.20	0.70	0.08	0.11
	90	651.824	0.1	130	0.20	0.60	0.04	0.09
	105	651.824	0.1	85	0.20	0.50	0.04	0.07
120	651.824	0.1	35	0.20	0.40	0.04	0.06	

Boring Ø	Setting of the balancing scale							
	613.411/615.250/615.272				613.411/615.209			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
11.8	12	13	14	15	9	10	11	12
11.9	12	14	15	16	10	11	12	13
12.0	13	14	15	17	11	12	13	14
12.1	14	15	16	17	12	13	14	15
12.2	15	16	17	18	12	14	15	16
12.3	16	17	18	19	13	14	15	17
12.4	17	18	19	20	14	15	16	17
12.5	17	18	20	21	15	16	17	18
12.6	18	19	20	21	16	17	18	19
12.7	19	20	21	22	17	18	19	20
12.8	20	21	22	23	17	18	20	21
12.9	21	22	23	24	18	19	20	21
13.0	21	22	23	24	19	20	21	22
13.1	22	23	24	25	20	21	22	23
13.2	23	24	25	26	21	22	23	24
13.3	24	25	26	27	21	22	23	25
13.4	24	25	26	28	22	23	24	25
13.5	25	26	27	28	23	24	25	26
13.6	26	27	28	29	24	25	26	27
13.7	27	28	29	30	24	25	27	28
13.8	27	28	29	30	25	26	27	28

**Note:**

- Using the combination of toolholder 615.272 with 615.250 or 615.209 with reduction bushing 613.411.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 13.8 use the next tool combination (615.273/615.251/615.210/613.413, see page 16).  
Wear safety goggles and use protective shields.



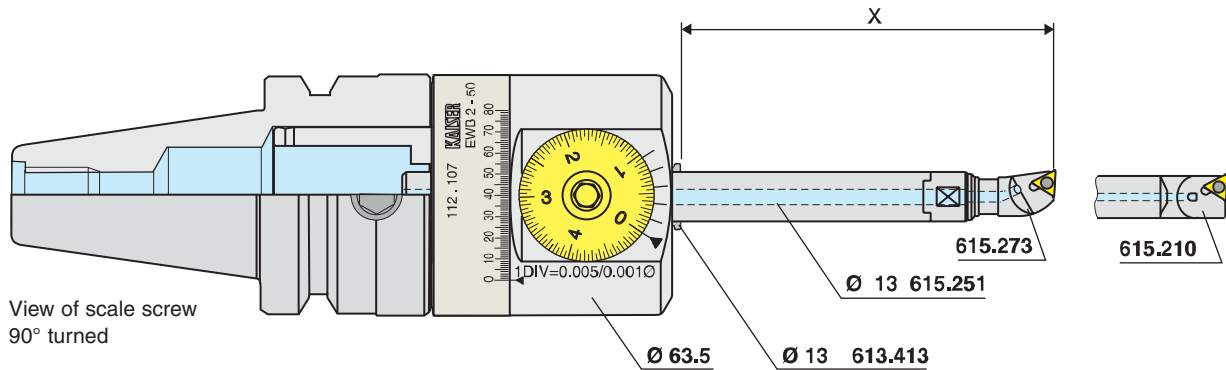
Material Group	Boring depth X	Cutting data Ø 13.8 - 15.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	50	651.738	0.3	260	0.25	0.90	0.08	0.18
	60	651.738	0.3	220	0.25	0.80	0.08	0.15
	70	651.738	0.3	170	0.20	0.70	0.08	0.12
	90	651.838	0.2	120	0.20	0.60	0.06	0.12
	110	651.838	0.2	80	0.20	0.50	0.06	0.10
1.5752	130	651.824	0.1	35	0.20	0.40	0.04	0.08
Heat treatable steel	50	651.737	0.3	260	0.25	0.90	0.08	0.16
	60	651.737	0.3	220	0.25	0.80	0.08	0.12
	70	651.737	0.3	170	0.20	0.70	0.08	0.11
	90	651.837	0.2	120	0.20	0.60	0.06	0.10
	110	651.837	0.2	80	0.20	0.50	0.06	0.10
1.2312 1.2343 1.2083	130	651.824	0.1	35	0.20	0.40	0.04	0.07
Stainless-steel	50	651.738	0.3	260	0.25	0.80	0.08	0.12
	60	651.738	0.3	220	0.25	0.70	0.08	0.12
	70	651.738	0.3	170	0.25	0.60	0.08	0.10
	90	651.838	0.2	120	0.25	0.50	0.06	0.10
	110	651.838	0.2	80	0.25	0.40	0.06	0.10
1.4301 1.4435 1.2764 1.2767	130	651.824	0.1	35	0.20	0.40	0.04	0.06
Cast Iron	50	651.735	0.3	230	0.25	1.20	0.08	0.14
	60	651.735	0.3	200	0.25	1.10	0.08	0.14
	70	651.735	0.3	170	0.25	0.90	0.08	0.12
	90	651.735	0.3	120	0.25	0.70	0.08	0.12
	110	651.824	0.1	80	0.25	0.60	0.04	0.08
130	651.824	0.1	35	0.20	0.50	0.04	0.08	
Aluminium Alloys	50	651.723	0.3	600	0.25	1.20	0.08	0.16
	60	651.723	0.3	450	0.25	1.10	0.08	0.16
	70	651.723	0.3	290	0.25	0.90	0.08	0.14
	90	651.723	0.3	200	0.25	0.70	0.08	0.12
	110	651.723	0.3	120	0.25	0.60	0.08	0.12
130	651.824	0.1	60	0.20	0.50	0.04	0.09	

Boring Ø	Setting of the balancing scale							
	613.412/615.219/615.273				613.412/615.224/615.273			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
13.8	11	12	13	14	10	12	13	14
13.9	12	13	14	15	11	13	14	15
14.0	12	14	15	16	12	14	15	16
14.1	13	14	15	17	13	15	16	17
14.2	14	15	16	17	14	15	17	18
14.3	15	16	17	18	15	16	18	19
14.4	16	17	18	19	16	17	19	20
14.5	17	18	19	20	17	18	19	21
14.6	17	18	19	21	18	19	20	22
14.7	18	19	20	21	19	20	21	22
14.8	19	20	21	22	20	21	22	23
14.9	20	21	22	23	21	22	23	24
15.0	21	22	23	24	21	23	24	25
15.1	21	22	23	24	22	24	25	26
15.2	22	23	24	25	23	24	26	27
15.3	23	24	25	26	24	25	26	28
15.4	24	25	26	27	25	26	27	28
15.5	24	25	26	27	26	27	28	29
15.6	25	26	27	28	27	28	29	30
15.7	26	27	28	29	28	29	30	31
15.8	27	28	29	30	28	29	31	32

**Note:**

- Using the combination of toolholder 615.273 with 615.219 or 615.224 and reduction bushing 613.412.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 15.8 use the next tool combination (615.281/615.233/615.221/613.414, see page 18). Wear safety goggles and use protective shields.



Material Group	Boring depth X	Cutting data Ø 13.8 - 15.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	50	651.738	0.3	300	0.25	0.90	0.08	0.17
	60	651.738	0.3	250	0.25	0.80	0.08	0.16
	80	651.838	0.2	170	0.20	0.70	0.06	0.11
	100	651.838	0.2	120	0.20	0.60	0.06	0.10
	120	651.824	0.1	70	0.20	0.50	0.04	0.07
1.5752	140	651.824	0.1	20	0.20	0.40	0.04	0.06
Heat treatable steel	50	651.737	0.3	300	0.25	0.90	0.08	0.17
	60	651.737	0.3	250	0.25	0.80	0.08	0.16
	80	651.837	0.2	170	0.20	0.70	0.06	0.11
	100	651.837	0.2	120	0.20	0.60	0.06	0.10
	120	651.824	0.1	70	0.20	0.50	0.04	0.07
1.2312 1.2343 1.2083	140	651.824	0.1	20	0.20	0.40	0.04	0.06
Stainless-steel	50	651.737	0.3	300	0.25	0.90	0.08	0.17
	60	651.737	0.3	250	0.25	0.80	0.08	0.16
	80	651.837	0.2	170	0.20	0.70	0.06	0.12
	100	651.837	0.2	120	0.20	0.60	0.06	0.10
	120	651.824	0.1	70	0.20	0.50	0.04	0.07
1.4301 1.4435 1.2764 1.2767	140	651.824	0.1	20	0.20	0.40	0.04	0.06
Cast Iron	50	651.734	0.4	300	0.25	0.90	0.10	0.17
	60	651.734	0.4	250	0.25	0.80	0.10	0.16
	80	651.735	0.3	170	0.20	0.70	0.08	0.15
	100	651.735	0.3	120	0.20	0.60	0.08	0.12
	120	651.834	0.2	70	0.20	0.50	0.06	0.07
	140	651.824	0.1	20	0.20	0.40	0.04	0.06
Aluminium Alloys	50	651.723	0.3	600	0.25	0.90	0.08	0.17
	60	651.723	0.3	450	0.25	0.80	0.08	0.16
	80	651.723	0.3	280	0.20	0.70	0.08	0.11
	100	651.723	0.3	190	0.20	0.60	0.08	0.10
	120	651.723	0.3	115	0.20	0.50	0.08	0.07
	140	651.824	0.1	30	0.20	0.40	0.04	0.06

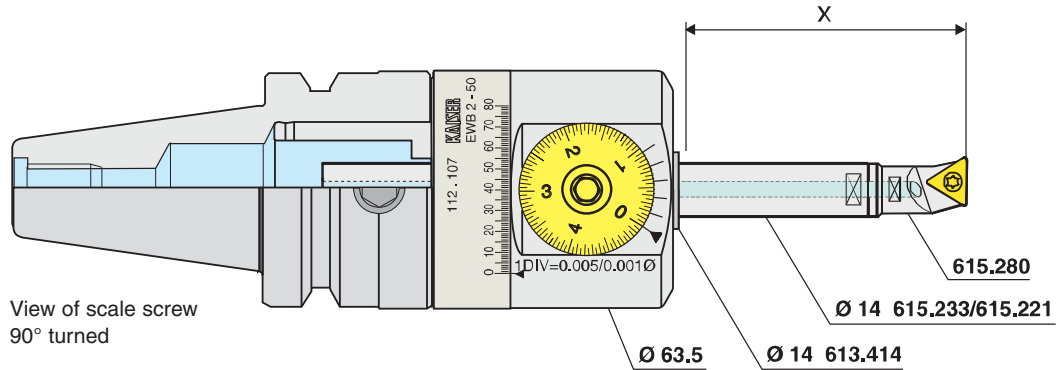
Boring Ø	Setting of the balancing scale							
	613.413/615.251/615.273				613.413/615.210			
	R 0.1	R 0.2	R 0.3	R 0.4	R 0.1	R 0.2	R 0.3	R 0.4
13.8	10	12	13	14	8	10	11	12
13.9	11	13	14	15	9	11	12	13
14.0	12	14	15	16	10	12	13	14
14.1	13	15	16	17	11	13	14	15
14.2	14	16	17	18	12	14	15	16
14.3	15	17	18	19	13	15	16	17
14.4	16	18	19	20	14	16	17	18
14.5	17	19	20	21	15	17	18	19
14.6	18	20	21	22	16	17	19	20
14.7	19	21	22	23	17	18	20	21
14.8	20	22	23	24	18	19	21	22
14.9	21	23	24	25	19	20	22	23
15.0	22	24	25	26	20	21	22	24
15.1	23	25	26	27	21	22	23	25
15.2	24	25	27	28	22	23	24	26
15.3	25	26	28	29	23	24	25	26
15.4	26	27	29	30	24	25	26	27
15.5	27	28	30	31	25	26	27	28
15.6	28	29	30	32	25	27	28	29
15.7	29	30	31	33	26	28	29	30
15.8	30	31	32	34	27	28	30	31

**Note:**

- Using the combination of toolholder 615.273 with 615.251 or 615.210 with reduction bushing 613.413.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 15.8 use the next tool combination (615.281/615.233/615.221/613.414, see page 18). Wear safety goggles and use protective shields.





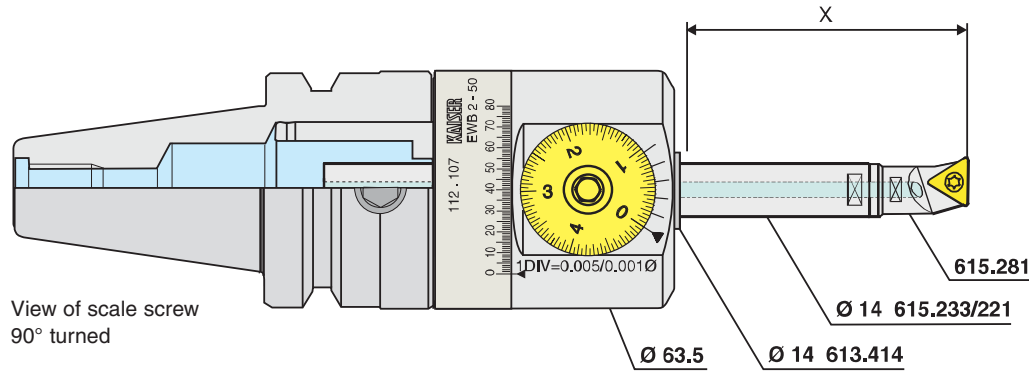
Material Group	Boring depth X	Cutting data Ø 14.8 - 16.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	50	651.738	0.3	350	0.25	0.90	0.08	0.17
	60	651.738	0.3	280	0.25	0.80	0.08	0.16
	70	651.838	0.2	170	0.20	0.70	0.06	0.11
	90	651.838	0.2	120	0.20	0.60	0.06	0.10
	110	651.824	0.1	70	0.20	0.50	0.04	0.07
1.5752	130	651.824	0.1	20	0.20	0.40	0.04	0.06
Heat treatable steel	50	651.737	0.3	300	0.25	0.90	0.08	0.17
	60	651.737	0.3	250	0.25	0.80	0.08	0.16
	70	651.837	0.2	170	0.20	0.70	0.06	0.11
	90	651.837	0.2	120	0.20	0.60	0.06	0.10
	110	651.824	0.1	70	0.20	0.50	0.04	0.07
1.2312 1.2343 1.2083	130	651.824	0.1	20	0.20	0.40	0.04	0.06
Stainless-steel	50	651.737	0.3	300	0.25	0.90	0.08	0.17
	60	651.737	0.3	250	0.25	0.80	0.08	0.16
	70	651.837	0.2	170	0.20	0.70	0.06	0.12
	90	651.837	0.2	120	0.20	0.60	0.06	0.10
	110	651.824	0.1	70	0.20	0.50	0.04	0.07
1.4301 1.4435 1.2764 1.2767	130	651.824	0.1	20	0.20	0.40	0.04	0.06
Cast Iron	50	651.734	0.4	300	0.25	0.90	0.10	0.17
	60	651.734	0.4	250	0.25	0.80	0.10	0.16
	70	651.735	0.3	170	0.20	0.70	0.08	0.15
	90	651.735	0.3	120	0.20	0.60	0.08	0.12
	110	651.834	0.2	70	0.20	0.50	0.06	0.07
130	651.824	0.1	20	0.20	0.40	0.04	0.06	
Aluminium Alloys	50	651.723	0.3	650	0.25	0.90	0.08	0.17
	60	651.723	0.3	490	0.25	0.80	0.08	0.16
	70	651.723	0.3	310	0.20	0.70	0.08	0.11
	90	651.723	0.3	210	0.20	0.60	0.08	0.10
	110	651.723	0.3	130	0.20	0.50	0.08	0.07
130	651.824	0.1	30	0.20	0.40	0.04	0.06	

Boring Ø	Setting of the balancing scale							
	613.414/615.233/615.280				613.414/615.221/615.280			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
14.8	6	8	11	17	6	7	11	17
14.9	7	9	12	18	7	9	12	18
15.0	9	10	13	19	8	10	13	19
15.1	10	11	14	20	9	11	14	20
15.2	11	12	15	20	11	12	15	21
15.3	12	13	16	21	12	13	16	22
15.4	13	14	17	22	13	14	18	23
15.5	14	15	18	23	14	16	19	24
15.6	15	16	19	24	15	17	20	26
15.7	16	17	20	25	16	18	21	27
15.8	17	18	21	26	17	19	22	28
15.9	18	19	22	27	19	20	23	29
16.0	19	20	23	28	20	21	24	30
16.1	20	21	24	29	21	22	25	31
16.2	21	22	25	30	22	23	26	32
16.3	22	23	26	31	23	24	27	33
16.4	23	24	27	32	24	25	28	34
16.5	24	25	28	33	25	26	29	35
16.6	25	26	29	34	26	27	30	36
16.7	26	27	30	35	27	29	31	37
16.8	27	28	31	35	28	30	32	38

**Note:**

- Using the combination of toolholder 615.280 with 615.233 or 615.221 and reduction bushing 613.414.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 16.8 use the next tool combination (615.281/615.233/615.221/613.414, see next page).  
Wear safety goggles and use protective shields.



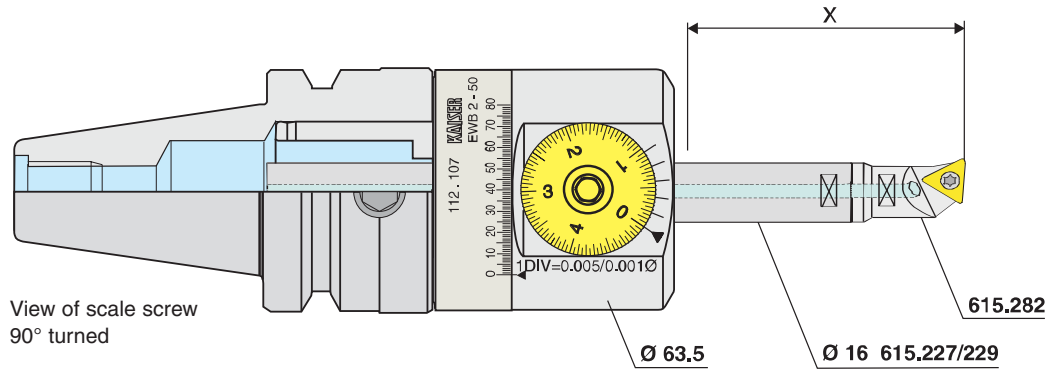
Material Group	Boring depth X	Cutting data Ø 15.8 - 17.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	50	655.334	0.8	350	0.25	1.00	0.14	0.25
	60	655.334	0.8	270	0.25	0.90	0.14	0.22
	80	655.385	0.4	190	0.25	0.70	0.10	0.18
	100	655.375	0.2	140	0.20	0.60	0.06	0.12
	135	655.363	0.1	45	0.20	0.40	0.04	0.08
Heat treatable steel	50	655.334	0.8	350	0.25	1.00	0.14	0.22
	60	655.334	0.8	270	0.25	0.90	0.14	0.20
	80	655.389	0.4	190	0.25	0.70	0.10	0.16
	100	655.379	0.2	140	0.20	0.60	0.06	0.10
	135	655.363	0.1	45	0.20	0.40	0.04	0.08
Stainless-steel	50	655.399	0.8	350	0.25	0.80	0.14	0.20
	60	655.399	0.8	250	0.25	0.70	0.14	0.18
	80	655.389	0.4	190	0.25	0.50	0.10	0.14
	100	655.379	0.2	140	0.20	0.40	0.06	0.09
	135	655.363	0.1	45	0.20	0.30	0.04	0.08
Cast Iron	50	655.393	0.8	350	0.25	1.30	0.14	0.28
	60	655.393	0.8	270	0.25	1.00	0.14	0.25
	80	655.383	0.4	190	0.25	0.90	0.10	0.20
	100	655.373	0.2	140	0.20	0.80	0.06	0.12
	135	655.363	0.1	45	0.20	0.50	0.04	0.08
Aluminium Alloys	50	655.398	0.8	690	0.25	1.50	0.14	0.30
	60	655.398	0.8	450	0.25	1.00	0.14	0.25
	80	655.388	0.4	300	0.25	0.80	0.10	0.20
	100	655.388	0.4	190	0.20	0.70	0.10	0.15
	135	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	613.414/615.233/615.281				613.414/615.221/615.281			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
15.8	9	10	13	19	8	10	13	19
15.9	10	11	14	20	9	11	14	20
16.0	11	12	15	20	11	12	15	21
16.1	12	13	16	21	12	13	16	22
16.2	13	14	17	22	13	14	18	23
16.3	14	15	18	23	14	16	19	24
16.4	15	16	19	24	15	17	20	26
16.5	16	17	20	25	16	18	21	27
16.6	17	18	21	26	17	19	22	28
16.7	18	19	22	27	19	20	23	29
16.8	19	20	23	28	20	21	24	30
16.9	20	21	24	29	21	22	25	31
17.0	21	22	25	30	22	23	26	32
17.1	22	23	26	31	23	24	27	33
17.2	23	24	27	32	24	25	28	34
17.3	24	25	28	33	25	26	29	35
17.4	25	26	29	34	26	27	30	36
17.5	26	27	30	35	27	29	31	37
17.6	27	28	31	35	28	30	32	38
17.7	28	29	31	36	29	31	33	39
17.8	29	30	32	37	30	32	34	40

**Note:**

- Using the combination of toolholder 615.281 with 615.233 or 615.221 and reduction bushing 613.414.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 17.8 use the next tool combination (615.282/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



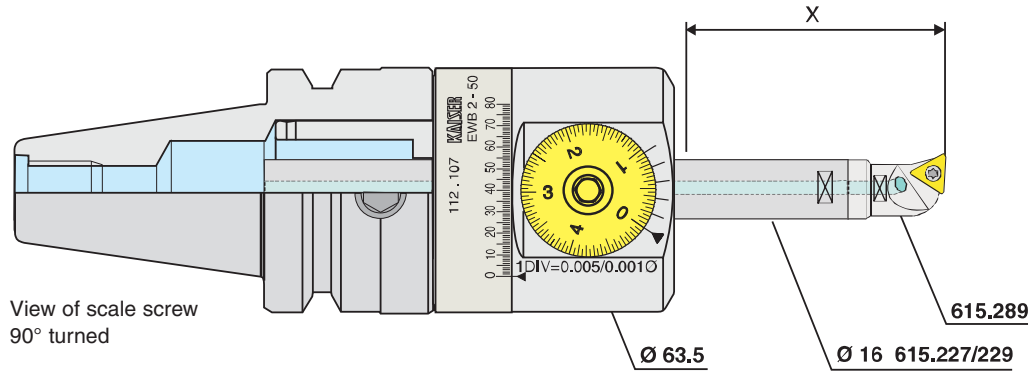
Material Group	Boring depth X	Cutting data Ø 17.8 - 19.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	780	0.25	2.50	0.14	0.30
	80	655.398	0.8	550	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.282				615.229/615.282			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
17.8	8	10	13	19	7	9	13	20
17.9	10	11	14	20	8	10	14	22
18.0	11	12	15	21	10	12	16	23
18.1	12	13	16	22	11	13	17	24
18.2	13	14	17	23	13	15	19	26
18.3	14	15	18	24	14	16	20	27
18.4	15	16	19	25	16	18	21	28
18.5	16	17	20	26	17	19	23	30
18.6	17	18	21	27	18	20	24	31
18.7	18	19	22	28	20	22	25	32
18.8	19	21	23	28	21	23	27	33
18.9	20	22	24	29	23	24	28	35
19.0	21	23	25	30	24	26	29	36
19.1	22	23	26	31	25	27	30	37
19.2	23	24	27	32	26	28	32	39
19.3	24	25	28	33	28	30	33	40
19.4	25	26	29	34	29	31	34	41
19.5	26	27	30	35	30	32	35	42
19.6	27	28	31	36	32	33	37	44
19.7	28	29	32	37	33	35	38	45
19.8	29	30	33	38	34	36	39	46

**Note:**

- Using the combination of toolholder 615.282 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 19.8 use the next tool combination (615.289/615.227/615.229, see next page). Wear safety goggles and use protective shields.



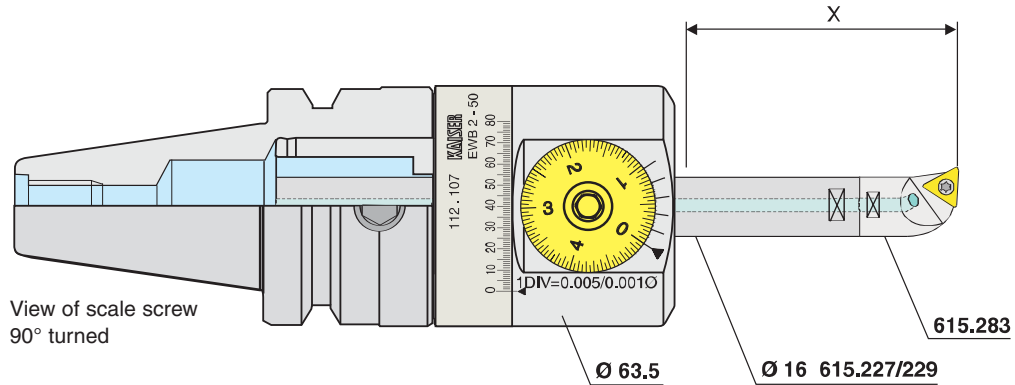
Material Group	Boring depth X	Cutting data Ø 19.8 - 21.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.09
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	870	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.289				615.229/615.289			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
19.8	8	10	13	19	7	9	13	21
19.9	9	11	14	20	8	10	14	22
20.0	11	12	15	21	10	12	16	23
20.1	12	13	16	22	11	13	17	25
20.2	13	14	17	23	13	15	19	26
20.3	14	15	18	24	14	16	20	27
20.4	15	17	19	25	16	18	21	29
20.5	16	18	20	26	17	19	23	30
20.6	17	19	21	27	19	20	24	31
20.7	18	20	22	28	20	22	26	33
20.8	19	21	24	29	21	23	27	34
20.9	20	22	25	30	23	25	28	35
21.0	21	23	26	31	24	26	29	37
21.1	22	24	27	32	25	27	31	38
21.2	23	25	28	33	27	29	32	39
21.3	24	26	29	34	28	30	33	40
21.4	25	27	30	35	29	31	35	42
21.5	26	28	30	36	31	32	36	43
21.6	27	29	31	37	32	34	37	44
21.7	28	30	32	38	33	35	39	46
21.8	29	31	33	39	35	36	40	47

**Note:**

- Using the combination of toolholder 615.289 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 21.8 use the next tool combination (615.283/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



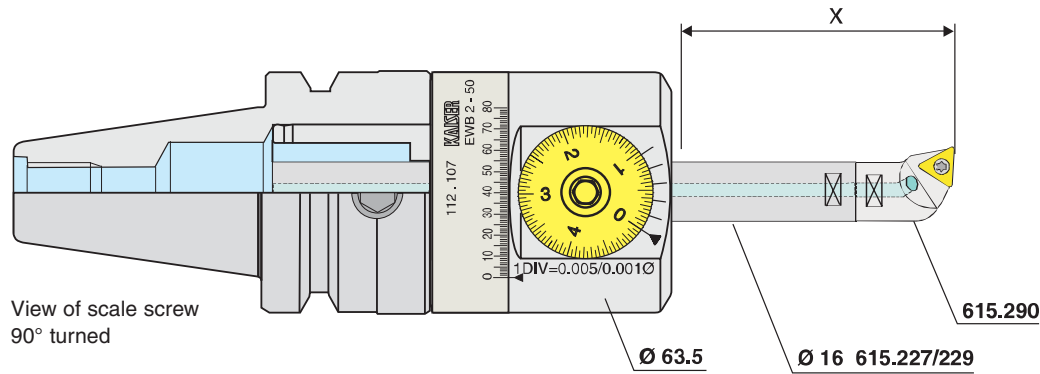
Material Group	Boring depth X	Cutting data Ø 21.8 - 23.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.16
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.16
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	950	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.283				615.229/615.283			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
21.8	9	10	13	19	7	9	13	21
21.9	10	12	14	20	9	11	15	22
22.0	11	13	16	21	10	12	16	24
22.1	12	14	17	22	12	14	18	25
22.2	13	15	18	23	13	15	19	26
22.3	14	16	19	24	15	17	20	28
22.4	15	17	20	25	16	18	22	29
22.5	17	18	21	26	18	19	23	30
22.6	18	19	22	27	19	21	24	32
22.7	19	20	23	28	20	22	26	33
22.8	20	21	24	29	22	24	27	34
22.9	21	22	25	30	23	25	28	35
23.0	22	23	26	31	24	26	30	37
23.1	23	24	27	32	26	28	31	38
23.2	24	25	28	33	27	29	32	39
23.3	25	26	29	34	28	30	34	40
23.4	26	27	30	35	30	31	35	42
23.5	27	28	31	36	31	33	36	43
23.6	28	29	32	37	32	34	37	44
23.7	29	30	33	38	34	35	39	46
23.8	30	31	34	39	35	37	40	47

**Note:**

- Using the combination of toolholder 615.283 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 23.8 use the next tool combination (615.290/615.227/615.229, see next page). Wear safety goggles and use protective shields.



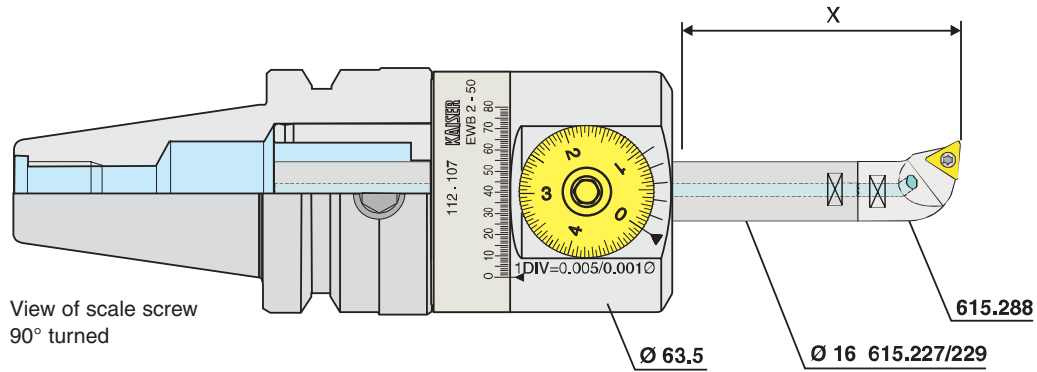
Material Group	Boring depth X	Cutting data Ø 23.8 - 24.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	1040	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.290				615.229/615.290			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
23.8	9	11	14	19	8	10	14	21
23.9	10	12	15	20	9	11	15	23
24.0	11	13	16	22	11	13	17	24
24.1	13	14	17	23	12	14	18	25
24.2	14	15	18	24	14	16	19	27
24.3	15	16	19	25	15	17	21	28
24.4	16	17	20	26	17	18	22	29
24.5	17	18	21	27	18	20	23	31
24.6	18	19	22	27	19	21	25	32
24.7	19	20	23	28	21	23	26	33
24.8	20	21	24	29	22	24	27	34
24.9	21	22	25	30	23	25	29	36
25.0	22	23	26	31	25	27	30	37
25.1	23	24	27	32	26	28	31	38
25.2	24	25	28	33	27	29	33	40
25.3	25	26	29	34	29	30	34	41
25.4	26	27	30	35	30	32	35	42
25.5	27	28	31	36	31	33	36	43
25.6	28	29	32	37	33	34	38	45
25.7	29	30	33	38	34	36	39	46
25.8	30	31	34	39	35	37	40	47

**Note:**

- Using the combination of toolholder 615.290 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 24.8 use the next tool combination (615.288/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



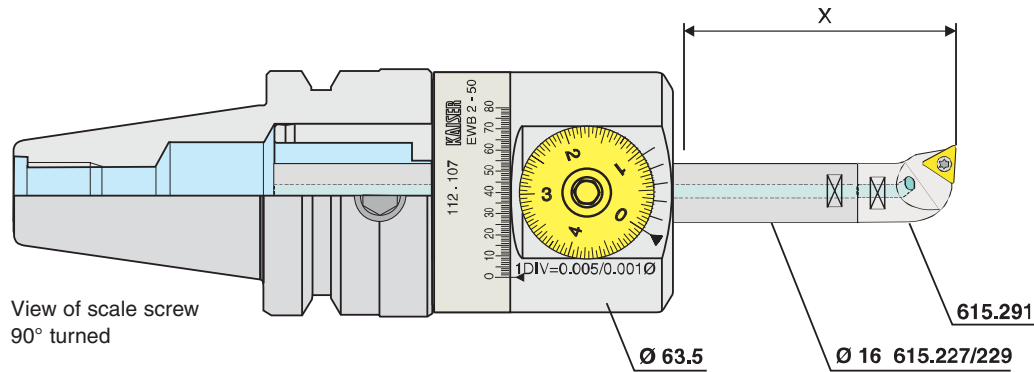
Material Group	Boring depth X	Cutting data Ø 24.8 - 25.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	1080	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.288				615.229/615.288			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
24.8	9	11	14	20	8	10	14	22
24.9	11	12	15	21	9	11	15	23
25.0	12	13	16	22	11	13	17	24
25.1	13	14	17	23	12	14	18	26
25.2	14	15	18	24	14	16	20	27
25.3	15	16	19	25	15	17	21	28
25.4	16	18	20	26	17	19	22	30
25.5	17	19	21	27	18	20	24	31
25.6	18	20	22	28	20	21	25	32
25.7	19	21	23	29	21	23	26	33
25.8	20	22	24	30	22	24	28	35
25.9	21	23	25	31	24	25	29	36
26.0	22	24	26	32	25	27	30	37
26.1	23	25	27	33	26	28	32	39
26.2	24	26	28	34	28	29	33	40
26.3	25	27	29	34	29	31	34	41
26.4	26	28	30	35	30	32	35	42
26.5	27	29	31	36	31	33	37	44
26.6	28	30	32	37	33	35	38	45
26.7	29	31	33	38	34	36	39	46
26.8	30	31	34	39	35	37	41	47

**Note:**

- Using the combination of toolholder 615.288 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values. Over Ø 25.8 use the next tool combination (615.291/615.227/615.229, see next page). Wear safety goggles and use protective shields.



Material Group	Boring depth X	Cutting data Ø 25.8 - 27.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	1000	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

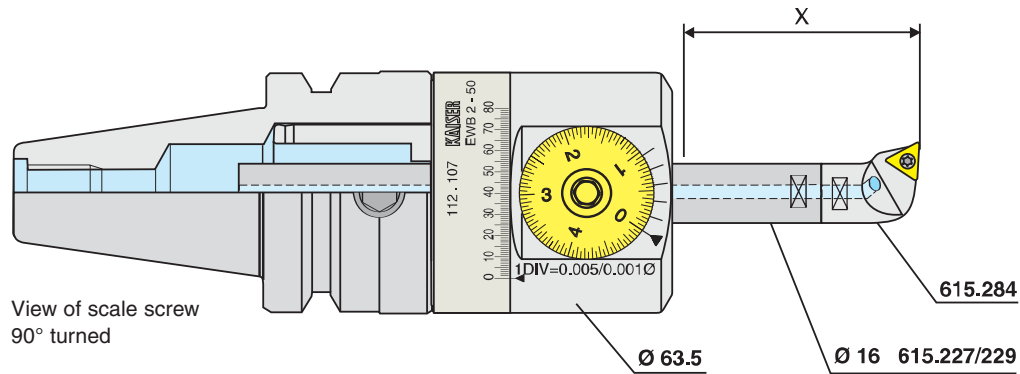
Boring Ø	Setting of the balancing scale							
	615.227/615.291				615.229/615.291			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
25.8	10	11	14	20	8	10	14	22
25.9	11	12	15	21	10	12	16	23
26.0	12	13	16	22	11	13	17	24
26.1	13	14	17	23	13	15	18	26
26.2	14	16	18	24	14	16	20	27
26.3	15	17	19	25	16	17	21	28
26.4	16	18	20	26	17	19	23	30
26.5	17	19	21	27	18	20	24	31
26.6	18	20	23	28	20	22	25	32
26.7	19	21	24	29	21	23	27	34
26.8	20	22	25	30	22	24	28	35
26.9	21	23	25	31	24	26	29	36
27.0	22	24	26	32	25	27	30	37
27.1	23	25	27	33	26	28	32	39
27.2	24	26	28	34	28	30	33	40
27.3	25	27	29	35	29	31	34	41
27.4	26	28	30	36	30	32	36	42
27.5	27	29	31	37	32	33	37	44
27.6	28	30	32	37	33	35	38	45
27.7	29	31	33	38	34	36	39	46
27.8	30	32	34	39	35	37	41	48

**Note:**

- Using the combination of toolholder 615.291 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 27.8 use the next tool combination (615.284/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



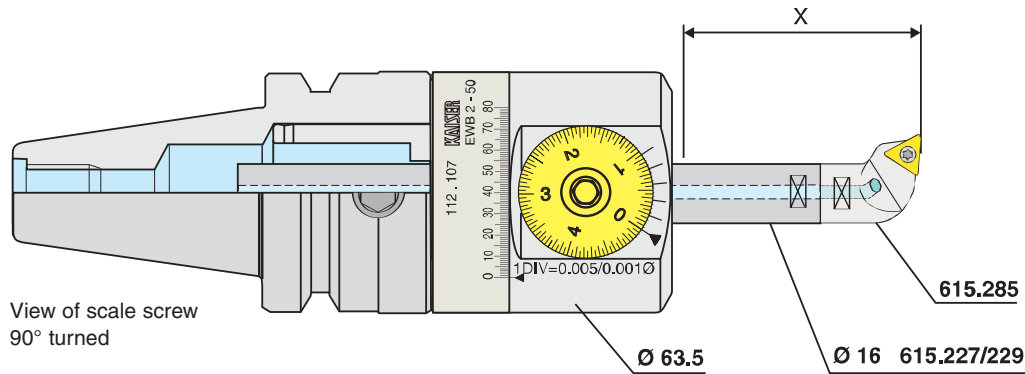


Material Group	Boring depth X	Cutting data Ø 27.8 - 31.8							Setting of the balancing scale										
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]		615.227/615.284				615.229/615.284						
		Order No.	R		Stand.	Max	Ra 1.6	Max.	Ø	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8		
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25	27.8	10	11	14	20	8	10	14	22		
	80	655.334	0.8	330	0.25	1.50	0.14	0.25	27.9	11	12	15	21	10	12	16	23		
	100	655.385	0.4	250	0.25	1.30	0.10	0.20	28.0	12	14	16	22	11	13	17	25		
	St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14	28.1	13	15	18	23	13	15	19	26	
	St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12	28.2	14	16	19	24	14	16	20	27	
Heat treatable steel	1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09	28.3	15	17	20	25	16	18	21	29	
	Ck45	60	655.334	0.8	450	0.25	1.50	0.14	0.22	28.4	16	18	21	26	17	19	23	30	
		80	655.334	0.8	330	0.25	1.50	0.14	0.22	28.5	17	19	22	27	18	20	24	31	
		100	655.389	0.4	250	0.25	1.30	0.10	0.18	28.6	18	20	23	28	20	22	25	32	
		1.2312	120	655.379	0.2	160	0.25	0.90	0.06	0.12	28.7	20	21	24	29	21	23	27	34
		1.2343	140	655.379	0.2	100	0.20	0.60	0.06	0.10	28.8	21	22	25	30	23	24	28	35
	1.2083	160	655.363	0.1	50	0.20	0.40	0.04	0.08	28.9	22	23	26	31	24	26	29	36	
	Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20	29.0	23	24	27	32	25	27	31	38	
		80	655.399	0.8	250	0.25	1.20	0.14	0.20	29.1	24	25	28	33	27	28	32	39	
		100	655.389	0.4	250	0.25	1.00	0.10	0.15	29.2	25	26	29	34	28	30	33	40	
		1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09	29.3	26	27	30	35	29	31	34	41
1.4435		140	655.379	0.2	100	0.20	0.50	0.06	0.08	29.4	27	28	31	36	30	32	36	43	
1.2764		160	655.363	0.1	50	0.20	0.30	0.04	0.08	29.5	28	29	31	37	32	34	37	44	
Cast Iron		60	655.393	0.8	350	0.25	2.50	0.14	0.28	29.6	29	30	32	38	33	35	38	45	
		80	655.393	0.8	350	0.25	2.50	0.14	0.28	29.7	29	31	33	39	34	36	40	46	
		100	655.383	0.4	250	0.25	1.50	0.10	0.22	29.8	30	32	34	40	36	37	41	48	
		120	655.383	0.4	160	0.20	0.70	0.10	0.16	29.9	31	33	35	40	37	39	42	49	
	140	655.373	0.2	100	0.20	0.60	0.06	0.12	30.0	32	34	36	41	38	40	43	50		
	160	655.363	0.1	50	0.20	0.50	0.04	0.08	30.1	33	35	37	42	39	41	45	52		
	Aluminium Alloys	60	655.398	0.8	850	0.25	2.50	0.14	0.30	30.2	34	36	38	43	41	42	46	53	
		80	655.398	0.8	600	0.25	2.00	0.14	0.30	30.3	35	37	39	44	42	44	47	54	
		100	655.398	0.8	400	0.25	1.50	0.14	0.25	30.4	36	37	40	45	43	45	48	56	
		120	655.388	0.4	250	0.25	1.00	0.10	0.18	30.5	37	38	41	46	45	46	50	57	
140		655.378	0.2	160	0.20	0.80	0.06	0.15	30.6	38	39	42	47	46	48	51	58		
160		655.378	0.2	70	0.20	0.60	0.06	0.12	30.7	39	40	43	48	47	49	52	60		
Safety reference		60	655.398	0.8	850	0.25	2.50	0.14	0.30	30.8	40	41	44	49	48	50	54	61	
		80	655.398	0.8	600	0.25	2.00	0.14	0.30	30.9	41	42	45	50	50	51	55	62	
		100	655.398	0.8	400	0.25	1.50	0.14	0.25	31.0	42	43	46	51	51	53	56	64	
		120	655.388	0.4	250	0.25	1.00	0.10	0.18	31.1	43	44	47	52	52	54	58	65	
	140	655.378	0.2	160	0.20	0.80	0.06	0.15	31.2	44	45	48	53	54	55	59	67		
	160	655.378	0.2	70	0.20	0.60	0.06	0.12	31.3	45	46	49	54	55	57	60	68		
	31.8	50	51	54	59	62	64	67	76										

**Note:**

- Using the combination of toolholder 615.284 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 31.8 use the next tool combination (615.285/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



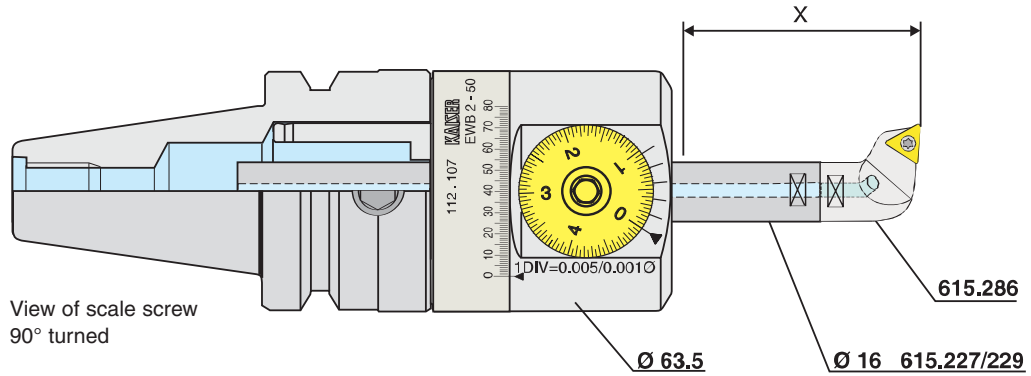
Material Group	Boring depth X	Cutting data Ø 31.8 - 35.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
	120	655.375	0.2	160	0.25	0.90	0.06	0.14
	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
	120	655.379	0.2	160	0.25	0.90	0.06	0.12
	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2312	160	655.363	0.1	50	0.20	0.40	0.04	0.08
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
	120	655.379	0.2	160	0.20	0.60	0.06	0.09
	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	850	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.285				615.229/615.285			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
31.8	11	12	15	21	9	11	15	23
31.9	12	13	16	22	11	13	16	24
32.0	13	14	17	23	12	14	18	25
32.1	14	15	18	24	13	15	19	27
32.2	15	16	19	25	15	17	21	28
32.3	16	17	20	26	16	18	22	29
32.4	17	19	21	27	18	20	23	30
32.5	18	20	22	28	19	21	25	32
32.6	19	21	23	29	21	22	26	33
32.7	20	22	24	30	22	24	27	34
32.8	21	23	25	31	23	25	29	36
32.9	22	24	26	32	25	26	30	37
33.0	23	25	27	33	26	28	31	38
33.1	24	26	28	34	27	29	33	39
33.2	25	27	29	34	29	30	34	41
33.3	26	28	30	35	30	32	35	42
33.4	27	29	31	36	31	33	36	43
33.5	28	30	32	37	32	34	38	45
33.6	29	31	33	38	34	35	39	46
33.7	30	31	34	39	35	37	40	47
33.8	31	32	35	40	36	38	41	48
33.9	32	33	36	41	38	39	43	50
34.0	33	34	37	42	39	41	44	51
34.1	34	35	38	43	40	42	45	52
34.2	35	36	39	44	41	43	47	54
34.3	36	37	40	45	43	44	48	55
34.4	37	38	41	46	44	46	49	56
34.5	38	39	42	47	45	47	50	58
34.6	39	40	43	48	46	48	52	59
34.7	40	41	44	49	48	50	53	60
34.8	41	42	45	50	49	51	54	62
34.9	42	43	46	51	50	52	56	63
35.0	43	44	46	52	52	53	57	65
35.1	44	45	47	53	53	55	58	66
35.2	45	46	48	54	54	56	60	67
35.3	45	47	49	55	56	57	61	69
35.4	46	48	50	56	57	59	63	70
35.5	47	49	51	57	58	60	64	72
35.6	48	50	52	58	60	62	65	74
35.7	49	51	53	59	61	63	67	75
35.8	50	52	54	60	62	64	68	77

**Note:**

- Using the combination of toolholder 615.285 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 35.8 use the next tool combination (615.286/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



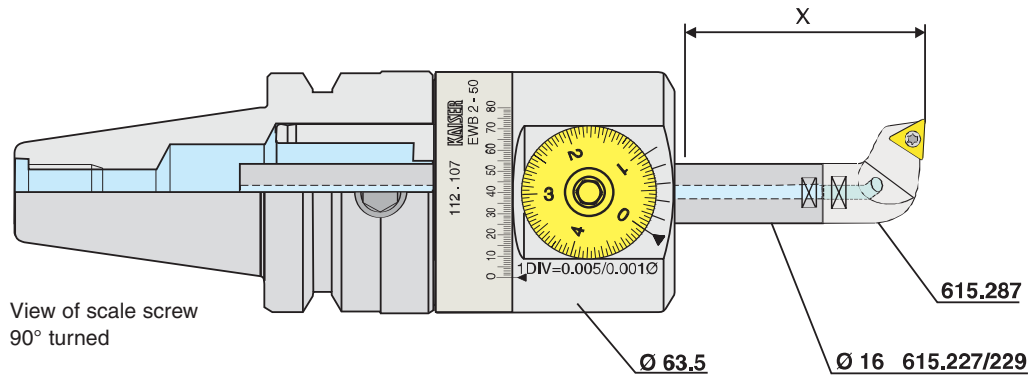
Material Group	Boring depth X	Cutting data Ø 35.8 - 39.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
	120	655.375	0.2	160	0.25	0.90	0.06	0.14
	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
	120	655.379	0.2	160	0.25	0.90	0.06	0.12
	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2312 1.2343 1.2083	160	655.363	0.1	50	0.20	0.40	0.04	0.08
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
	120	655.379	0.2	160	0.20	0.60	0.06	0.09
	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.4301 1.4435 1.2764 1.2767	160	655.363	0.1	50	0.20	0.30	0.04	0.08
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	850	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.286				615.229/615.286			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
35.8	11	13	16	22	10	12	16	23
35.9	13	14	17	23	11	13	17	25
36.0	14	15	18	24	13	15	19	26
36.1	15	16	19	25	14	16	20	27
36.2	16	17	20	26	16	18	21	29
36.3	17	18	21	27	17	19	23	30
36.4	18	19	22	28	19	20	24	31
36.5	19	20	23	29	20	22	25	33
36.6	20	21	24	30	21	23	27	34
36.7	21	22	25	30	23	25	28	35
36.8	22	23	26	31	24	26	29	36
36.9	23	24	27	32	25	27	31	38
37.0	24	25	28	33	27	29	32	39
37.1	25	26	29	34	28	30	33	40
37.2	26	27	30	35	29	31	35	42
37.3	27	28	31	36	31	32	36	43
37.4	28	29	32	37	32	34	37	44
37.5	29	30	33	38	33	35	38	45
37.6	30	31	34	39	35	36	40	47
37.7	31	32	35	40	36	38	41	48
37.8	32	33	36	41	37	39	42	49
37.9	33	34	37	42	38	40	44	51
38.0	34	35	38	43	40	41	45	52
38.1	35	36	39	44	41	43	46	53
38.2	36	37	40	45	42	44	47	54
38.3	37	38	41	46	43	45	49	56
38.4	38	39	42	47	45	46	50	57
38.5	39	40	43	48	46	48	51	59
38.6	40	41	44	49	47	49	53	60
38.7	41	42	44	50	49	50	54	61
38.8	42	43	45	51	50	52	55	63
38.9	42	44	46	52	51	53	57	64
39.0	43	45	47	53	53	54	58	66
39.1	44	46	48	54	54	56	59	67
39.2	45	47	49	55	55	57	61	69
39.3	46	48	50	56	57	58	62	70
39.4	47	49	51	57	58	60	64	72
39.5	48	50	52	58	59	61	65	73
39.6	49	51	53	59	61	62	66	75
39.7	50	52	54	60	62	64	68	76
39.8	51	52	55	61	63	65	69	78

**Note:**

- Using the combination of toolholder 615.286 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 39.8 use the next tool combination (615.287/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



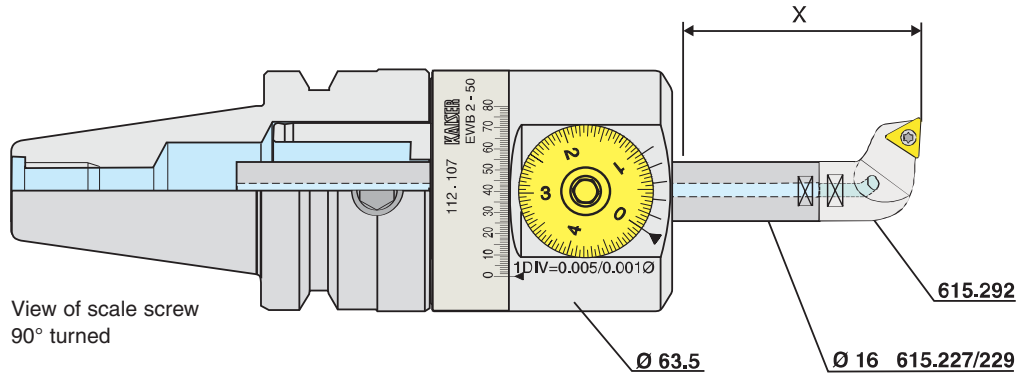
Material Group	Boring depth X	Cutting data Ø 39.8 - 44.8						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	800	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.287				615.229/615.287			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
39.8	13	14	17	23	11	13	17	24
39.9	14	15	18	24	13	15	18	26
40.0	15	16	19	25	14	16	20	27
40.1	16	17	20	26	15	17	21	28
40.2	17	18	21	27	17	19	23	30
40.3	18	19	22	28	18	20	24	31
40.4	19	20	23	29	20	22	25	32
40.5	20	21	24	30	21	23	27	34
40.6	21	23	25	31	22	24	28	35
40.7	22	24	26	32	24	26	29	36
40.8	23	25	27	33	25	27	30	37
40.9	24	26	28	33	26	28	32	39
41.0	25	27	29	34	28	30	33	40
41.1	26	28	30	35	29	31	34	41
41.2	27	28	31	36	30	32	36	43
41.3	28	29	32	37	32	33	37	44
41.4	29	30	33	38	33	35	38	45
41.5	30	31	34	39	34	36	39	46
41.6	31	32	35	40	36	37	41	48
41.7	32	33	36	41	37	39	42	49
41.8	33	34	37	42	38	40	43	50
41.9	34	35	38	43	39	41	45	52
42.0	35	36	39	44	41	42	46	53
42.1	36	37	40	45	42	44	47	54
42.2	37	38	41	46	43	45	48	56
42.3	38	39	42	47	45	46	50	57
42.4	39	40	43	48	46	48	51	58
42.5	40	41	44	49	47	49	52	60
42.6	41	42	45	50	48	50	54	61
42.7	42	43	46	51	50	51	55	62
42.8	43	44	46	52	51	53	56	64
42.9	44	45	47	53	52	54	58	65
43.0	44	46	48	54	54	55	59	67
43.1	45	47	49	55				
43.2	46	48	50	56				
43.3	47	49	51	57				
43.4	48	50	52	58				
43.5	49	51	53	59				
43.6	50	52	54	60				
43.7	51	53	55	61				
43.8	52	54	56	62				
43.9	53	55	57	63				
44.0	54	56	58	64				
44.1	55	57	59	65				
44.2	56	58	60	66				
44.3	57	59	61	67				
44.4	58	60	62	68				
44.5	59	61	64	70				
44.6	60	62	65	71				
44.7	61	63	66	72				
44.8	62	64	67	73				

**Note:**

- Using the combination of toolholder 615.287 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Over Ø 44.8 use the next tool combination (615.292/615.227/615.229, see next page).  
Wear safety goggles and use protective shields.



Material Group	Boring depth X	Cutting data Ø 44.8 - 50						
		Inserts		Vc [m/min]	Mat'l Allw. (Ø) [mm]		Feed [mm/Rev.]	
		Order No.	R		Stand.	Max	Ra 1.6	Max.
Low carbon steel	60	655.334	0.8	450	0.25	1.50	0.14	0.25
	80	655.334	0.8	330	0.25	1.50	0.14	0.25
	100	655.385	0.4	250	0.25	1.30	0.10	0.20
St37-2	120	655.375	0.2	160	0.25	0.90	0.06	0.14
St52-3	140	655.375	0.2	100	0.20	0.60	0.06	0.12
1.5752	160	655.363	0.1	50	0.20	0.40	0.04	0.09
Heat treatable steel	60	655.334	0.8	450	0.25	1.50	0.14	0.22
	80	655.334	0.8	330	0.25	1.50	0.14	0.22
	100	655.389	0.4	250	0.25	1.30	0.10	0.18
Ck45	120	655.379	0.2	160	0.25	0.90	0.06	0.12
1.2312	140	655.379	0.2	100	0.20	0.60	0.06	0.10
1.2343	160	655.363	0.1	50	0.20	0.40	0.04	0.08
1.2083								
Stainless-steel	60	655.399	0.8	250	0.25	1.50	0.14	0.20
	80	655.399	0.8	250	0.25	1.20	0.14	0.20
	100	655.389	0.4	250	0.25	1.00	0.10	0.15
1.4301	120	655.379	0.2	160	0.20	0.60	0.06	0.09
1.4435	140	655.379	0.2	100	0.20	0.50	0.06	0.08
1.2764	160	655.363	0.1	50	0.20	0.30	0.04	0.08
1.2767								
Cast Iron	60	655.393	0.8	350	0.25	2.50	0.14	0.28
	80	655.393	0.8	350	0.25	2.50	0.14	0.28
	100	655.383	0.4	250	0.25	1.50	0.10	0.22
	120	655.383	0.4	160	0.20	0.70	0.10	0.16
	140	655.373	0.2	100	0.20	0.60	0.06	0.12
	160	655.363	0.1	50	0.20	0.50	0.04	0.08
Aluminium Alloys	60	655.398	0.8	800	0.25	2.50	0.14	0.30
	80	655.398	0.8	600	0.25	2.00	0.14	0.30
	100	655.398	0.8	400	0.25	1.50	0.14	0.25
	120	655.388	0.4	250	0.25	1.00	0.10	0.18
	140	655.378	0.2	160	0.20	0.80	0.06	0.15
	160	655.378	0.2	70	0.20	0.60	0.06	0.12

Boring Ø	Setting of the balancing scale							
	615.227/615.292				615.229/615.292			
	R 0.1	R 0.2	R 0.4	R 0.8	R 0.1	R 0.2	R 0.4	R 0.8
44.8	14	16	18	24	13	15	18	26
44.9	15	17	20	25	14	16	20	27
45.0	16	18	21	26	16	17	21	29
45.1	17	19	22	27	17	19	23	30
45.2	18	20	23	28	18	20	24	31
45.3	19	21	24	29	20	22	25	32
45.4	21	22	25	30	21	23	27	34
45.5	22	23	26	31	23	24	28	35
45.6	23	24	27	32	24	26	29	36
45.7	24	25	28	33	25	27	31	38
45.8	25	26	29	34	27	28	32	39
45.9	26	27	30	35	28	30	33	40
46.0	27	28	31	36	29	31	34	41
46.1	28	29	32	37	31	32	36	43
46.2	29	30	33	38	32	34	37	44
46.3	30	31	34	39	33	35	38	45
46.4	31	32	34	40	34	36	40	47
46.5	32	33	35	41	36	37	41	48
46.6	32	34	36	42	37	39	42	49
46.7	33	35	37	43	38	40	43	50
46.8	34	36	38	44	40	41	45	52
46.9	35	37	39	44	41	43	46	53
47.0	36	38	40	45	42	44	47	54
47.1	37	39	41	46	43	45	49	56
47.2	38	40	42	47	45	46	50	57
47.3	39	41	43	48	46	48	51	58
47.4	40	41	44	49	47	49	53	60
47.5	41	42	45	50	49	50	54	61
47.6	42	43	46	51	50	52	55	63
47.7	43	44	47	52	51	53	57	64
47.8	44	45	48	53	52	54	58	66
47.9	45	46	49	54	54	56	59	67
48.0	46	47	50	55	55	57	61	69
48.1	47	48	51	56				
48.2	48	49	52	57				
48.3	49	50	53	58				
48.4	50	51	54	59				
48.5	51	52	55	60				
48.6	52	53	56	61				
48.7	53	54	57	62				
48.8	54	55	58	64				
48.9	55	56	59	65				
49.0	56	57	60	66				
49.1	57	58	61	67				
49.2	58	59	62	68				
49.3	59	60	63	69				
49.4	60	61	64	70				
49.5	61	62	65	71				
49.6	62	63	66	73				
49.7	63	64	67	74				
49.8	64	66	69	75				
49.9	65	67	70	76				
50.0	66	68	71	78				

**Note:**

- Using the combination of toolholder 615.292 and 615.227 or 615.229.
- The use of other tool components causes increased unbalance.
- Maximum values for material allowance and feed rate should not be combined.
- All tools are designed with internal coolant.
- All values without guarantee!

**Safety reference:** The cutting speed and the calculated rpm should not exceed max. values.  
Wear safety goggles and use protective shields.