*multicut**

Precision tools for the manufacturing
and damage-free testing of
axis-symmetrical sealing surfaces
in screwed-in bores
ISO 1179-1 / DIN 3852-2
ISO 9974-1 / DIN 3852-1

Reduce repair costs and downtimes of hydraulic systems drastically with the ***multicut**** precision tool

"The tool" made for the hydraulic engineer... "The tool" made for the practitioner...

...recommended by Parker in user training!

www.multicut.com

REINHARD
FEINMECHANIK GMBH

Advantages of the *multicut** precision tools

1. **High tool productivity and profitability.**
2. **Sealing area repair in a few minutes.**
3. **Amortization already after initial use** (depending on the specific application).
4. **Technology tried and tested in practice.**

5. **Accurate and safe application technology.**
6. **Easy and uniform tool handling.**
7. **Tools not tied to a location, so they can be used everywhere** (without electrical energy).

8. **Suitable especially for repairing and servicing “on location”.**
9. **Manual use with an open-end or ring wrench.**
10. **Sealing surface repair possible without disassembling the pressure-less component** (if used carefully).
11. **High surface finish of the repaired flattened area.**
12. **High angular accuracy of the repaired flattened area with respect to the thread.**

13. **The profile steel is removable and can be** (manually) **re-sharpened.**
14. **Profile steel re-sharpening possible “manually on the bench grinder”.**

Practical application fields of the *multicut** precision tools

The multicut* precision tools are used in different fields for manufacturing or repairing sealing surfaces such as in:

- **Construction machinery** (crawlers, excavators, cranes)
- **Container and compressor construction**
- **Mining machinery**
- **Flying devices and aerospace**
- **Handling and hoisting devices**
- **Track vehicles**
- **Agricultural machinery**
- **Truck & vehicle construction**
- **Metrology**
- **Mobile hydraulics**
- **Pneumatics**
- **Steel and metallurgical engineering**
- **Stationary hydraulics**
- **Vacuum technology**
- **Machine tools**
- **Compression moulding**
- **Rail cars**
- **Ship building**

General information about sealing surfaces

Sealing surface quality on screw-in bores ISO 1179-1 / DIN 3852-2; ISO 9974-1 / DIN 3852-1 (Fig.1) is decisive for the functional safety of hydraulic systems, machines or installations.

Improperly manufactured or damaged sealing surfaces (Fig. 2) leak and are therefore an immediate cause for system breakdowns.

For this reason, the entire fluid technology field puts special emphasis on the high-quality design of sealing surfaces.


Fig. 1


Fig. 2

The essential evaluation criteria for a sealing surface are:

1. Positional deviation (angular position) of the sealing surface with respect to the screw-in bore thread
2. The surface finish of the sealing surface

When producing hydraulic components in series using machine tools (as is the case in a machining center, a boring mill and a milling or drilling machine, for instance), the 1st criterion is generally fulfilled by the machine's condition.

If the machine's condition is very good, fulfillment of the 2nd criterion does not depend on the machine but on the tools. Unsuitable or dull tools produce surfaces that do not fulfill the 2nd criterion and cause functional problems that must be rectified when the components, machine groups or structural components are assembled, at the latest. When already operating structural components of systems, machines or installations are repaired, screwed pipes or locking screws must generally be disassembled, so that during assembly the corresponding sealing surfaces on the screw-in bores do not fulfill the 2nd criterion most of the time. Sometimes, the surfaces are damaged, corroded or colored.

Damages can occur either by using threaded pipes or locking screws with metallic sealing edges or by careless disassembly. Therefore, a refinishing or repairing of the sealing surface is essential so that the functional safety of the repaired hydraulic system, machine or installation is ensured once again after assembly.

Without ***multicut**** precision tools, the refinishing of damaged sealing areas needs the use of expensive machine tools on which structural components must be laboriously aligned and processed. In addition, the long waiting time plus the time needed for disassembling and reassembling the hydraulic systems causes production loss in the plants and machines. Often, the repair of only one sealing surface causes enormous expenses that often reach three or four figures.

Re-finishing and repairing sealing surfaces

By using the patented ***multicut**** precision tools, you reduce the sealing surface repair work to a few minutes, thus controlling your costs very well and saving a lot of money.

Sealing surfaces for screw-in bores for:

- **Screwed pipes**
- **Oil level gauges**
- **Locking screws**
- **Spark plugs**

that are found in structural components of systems such as

- **Housings**
- **Filters**
- **Compressors**
- **Motors**
- **Pumps**
- **Clamping elements**
- **Valves**
- **Distribution rails**
- **Manifold blocks**
- **Cylinders**

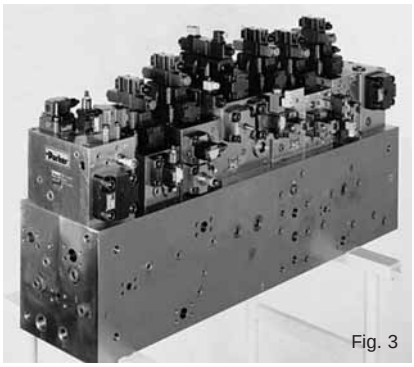


Fig. 3

Picture credit: Parker Hannifin NMF GmbH

can be manufactured or repaired everywhere manually, quickly and economically with the ***multicut**** precision tools without using a machine, just with the suitable ring or open-end wrench.

Difficult, time-consuming and expensive work such as the disassembly of the structural system components, the alignment and machining on a boring mill or on a milling or boring machine or, in the individual case, the scrapping of entire structural components do not occur when ***multicut**** precision tools are used, so that the tool investment is amortized after just a few uses.

multicut* precision tools have already proven their worth in customer service, machine repair, aggregates and installations and in the assembly of hydraulic components. Likewise, in the series production of hydraulic components in a machining center, sealing surfaces not made accurately according to specifications can be economically refinished once again if necessary.

Manufacturing, re-finishing, mending and repairing sealing surfaces in screw-in bores generally takes no longer than 3 minutes per sealing surface.

Requirements:

- ***multicut**** **basic tool** (fits the screw-in bore thread), see Tables 1, 2 & 5.
- ***multicut**** **profile steel** (fits the sealing surface diameter to be worked on), see Table 3.
- **Ring or open-end wrench** (for turning the basic body).

You can download our catalogue and detailed instructions for use from our website ***www.multicut.com***


Fig. 4


Fig. 5

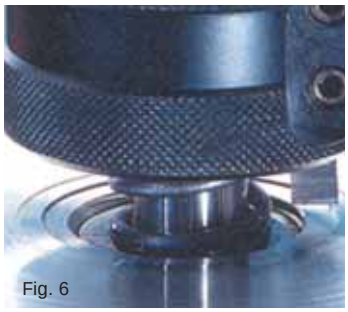


Fig. 6

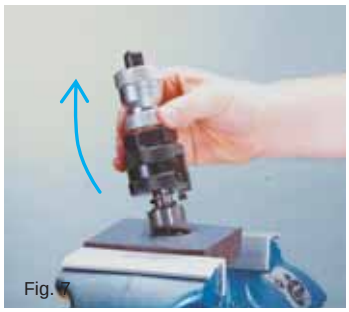


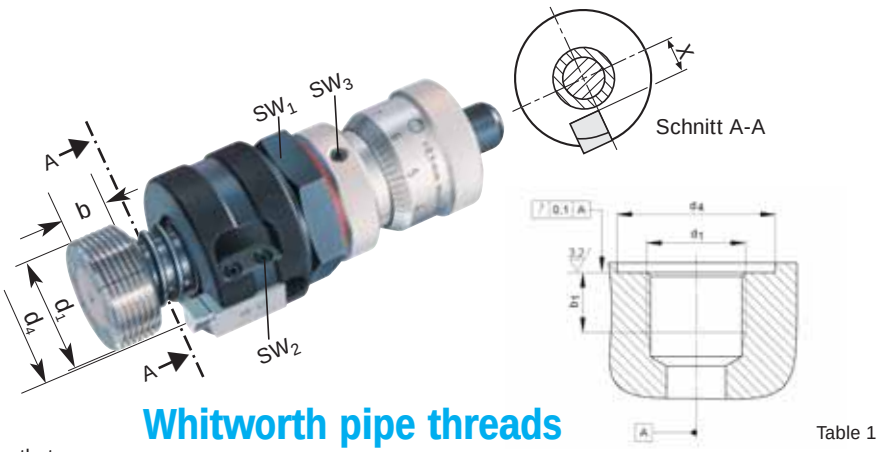
Fig. 7

*multicut** precision tools
(basic tools)

With the ***multicut**** precision tools, sealing areas in screw-in bores can be made or repaired in accordance with ISO 1179-1/ DIN 3852-2; ISO 9974-1/DIN 3852-1.

The unique working principle of the ***multicut**** precision tool is exactly intended for the middle axis of the screw-in bore via the threaded sides and is ready for use in less than a minute.

The micrometer screw with a 1/100 mm spacing additionally incorporated into the tool allows controlled depth adjustment of the removable profile steel, which can be individually profiled for manufacturing special sealing surfaces if needed.



The design of the threaded shaft counteracts the introduction of chips that occurs while machining the flattened sealing surface in the hydraulics cycle and allows the occasional machining of sealing surfaces in already “filled” but pressure-less hydraulic systems if the user takes the necessary precautions.

The ***multicut**** precision tools and the necessary profile steels are individually available in all standard sizes corresponding to ISO 1179-1/DIN 3852-2; ISO 9974-1/DIN 3852-1 of screw-in bores from G 1/8” to G 2” and from M 10 x 1 to M 78 x 2 or in the practical outdoor case.

For machining sealing surfaces, a ***multicut**** precision tool that fits the screw-in bore thread and a correspondingly suitable ***multicut**** profile steel are needed.

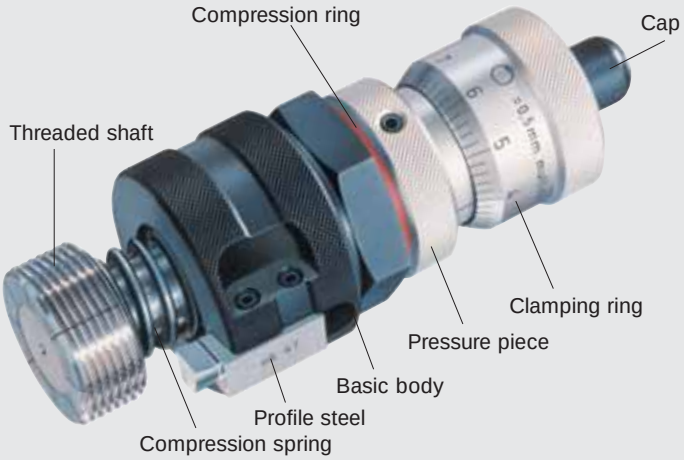


Fig. 8

multicut* is designed for use in removable cutting bodies (profile steels). The profile steel suitable for the use in question can be inferred from Tables 3 and 4. The profile steel is not included in the delivery and must be ordered separately.

Ordering example:

1 piece ***multicut**** 20 50 00
1 piece profile steel 20 50 11
(see profile steel data sheet)

or

1 piece ***multicut**** G 3/4″ – 33
(incl. profile steel
D_4 = 33 mm)

item number

Profile steel for 33 mm diameter

Tool size

We deliver special sizes of tools and profile steels by request.

Whitworth pipe threads

Table 1

Screw-in bore d_1	Preferred size	Sealing area diameter d_4^A mm	d_4^B mm	d_4^C mm	Standard design b_1 mm	b mm	Wrench area SW_1 mm	SW_2 mm	SW_3 mm	X mm	Item no. basic tool
G 1/8"	●	15	17	19	8	7	19	2	2,5		**20 10 00**
G 1/4"	●	19	21	25	12	10	24	2,5	2,5		**20 20 00**
G 3/8"	●	23	25	28	12	10	27	2,5	2,5		**20 30 00**
G 1/2"	●	27	29	34	14	13	27	3	2,5		**20 40 00**
G 3/4"	●	33	36	42	16	14	41	3	3		**20 50 00**
G 1"	●	40	42	47	18	16	41	3	3		**20 60 00**
G 1 1/8"		45	47	51	20	18	46	3	3		**20 70 00**
G 1 1/4"	●	50	52	58	20	18	50	3	3		**20 80 00**
G 1 3/8"		52	54	59	22	18	50	3	3		**20 90 00**
G 1 1/2"	●	56	58	65	22	20	50	4	3		**21 00 00**
G 1 3/4"		63	65	69	24	22	50	4	3		**21 10 00**
G 2"		69	–	76	24	22	65	5	5		**21 20 00**

Metric fine thread

Table 2

Screw-in bore d_1	Preferred size	Sealing area diameter d_4^A mm	d_4^B mm	d_4^C mm	Standard design b_1 mm	b mm	Wrench area SW_1 mm	SW_2 mm	SW_3 mm	X mm	Item no. basic tool
M 10 x 1	●	15	20	–	8	7	19	2	2,5		**22 20 00**
M 12 x 1,5	●	18	25	–	12	7	22	2,5	2,5		**22 30 00**
M 14 x 1,5	●	20	25	–	12	10	24	2,5	2,5		**22 40 00**
M 16 x 1,5	●	22	28	–	12	10	27	3	2,5		**22 50 00**
M 18 x 1,5	●	24	30	–	12	10	27	3	2,5		**22 60 00**
M 20 x 1,5	●	26	34	–	14	13	27	3	2,5		**22 70 00**
M 22 x 1,5	●	28	34	–	14	13	27	3	2,5		**22 80 00**
M 24 x 1,5		30	38	–	14	13	41	4	3		**22 90 00**
M 26 x 1,5	●	32	42	–	16	14	41	4	3		**23 00 00**
M 27 x 2	●	33	42	–	16	14	41	4	3		**23 10 00**
M 30 x 1,5		37	44	–	–	14	41	4	3		**23 20 00**
M 30 x 2		37	44	–	16	14	41	4	3		**23 30 00**
M 33 x 2	●	40	47	–	18	16	41	4	3		**23 40 00**
M 36 x 1,5		43	50	–	–	16	46	4	3		**23 50 00**
M 36 x 2		43	50	–	18	16	46	4	3		**23 60 00**
M 38 x 1,5		45	52	–	–	16	46	4	3		**23 70 00**
M 39 x 2		47	53	–	–	16	46	4	3		**23 80 00**
M 42 x 1,5		50	56	–	–	18	50	4	3		**23 90 00**
M 42 x 2	●	50	58	–	20	18	50	4	3		**24 00 00**
M 45 x 1,5		53	59	–	–	18	50	4	3		**24 10 00**
M 45 x 2		53	59	–	20	18	50	4	3		**24 20 00**
M 48 x 1,5		56	61	–	–	20	50	4	3		**24 30 00**
M 48 x 2	●	56	65	–	22	20	50	4	3		**24 40 00**
M 50 x 2		–	65	–	21,5	20	50	4	3		**24 50 00**
M 52 x 1,5		61	65	–	–	20	50	4	3		**24 60 00**
M 52 x 2		61	65	–	–	20	50	4	3		**24 70 00**
M 56 x 2		65	69	–	–	20	50	4	3		**24 80 00**
M 60 x 2		69	73	–	–	22	65	5	5		**24 90 00**
M 64 x 2		73	77	–	–	22	65	5	5		**25 00 00**
M 78 x 2		89	–	–	–	22	65	5	5		**25 10 00**

*multicut** profile steels

The corresponding standard profile steels (see Fig. 9) are available for manufacturing the sealing surface diameters listed in ISO 1179-1/DIN 3852; ISO 9974-1/DIN 3852-1. The profile steels can be used in different multicut* precision tools.

You can choose the suitable profile steel and determine the corresponding ordering information from Tables 3 and 4.

Profile steels are made from valuable high performance steel for tools. The cutting edge is executed with a positive cutting geometry (see Fig.10) suitable for long-chipping materials.

For short-chipping materials such as grey cast iron, we recommend the manual modification of the profile steel with a suitable grindstone. To do this, attach a small chamfer of approx. 0.5 mm to the cutting edge so the profile steel gets a negative cutting geometry (see Fig.11).

Please inquire separately about special sizes.

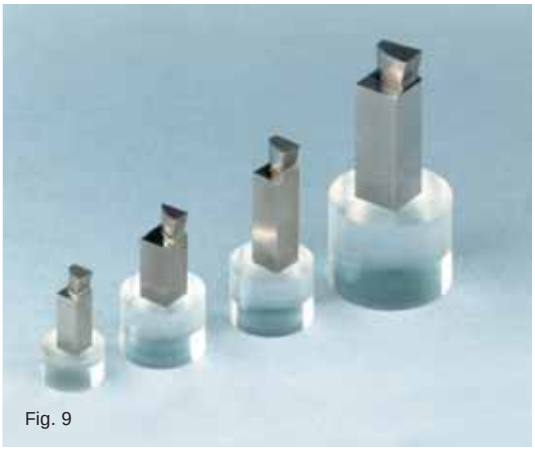


Fig. 9

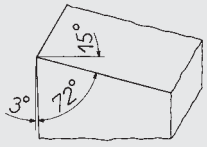


Fig. 10

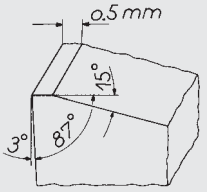
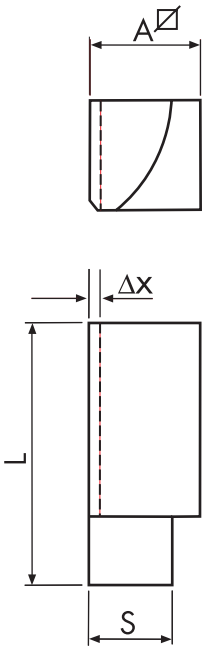


Fig. 11

Table 3

Screw-in bore d_1	Sealing surface diameter d_4 mm	A ⌀ mm	L mm	S mm	ΔX mm	Item no.. profile steel
G 1/8"	**15**	6	17,5	2,5	0	**20 10 11**
G 1/8"	**17**	6	17,5	3,5	0	**20 10 12**
G 1/8"	**19**	6	17,5	4,5	0	**20 10 13**
G 1/4"	**19**	8	19	3,5	0	**20 20 11**
G 1/4"	**21**	8	19	4,5	0	**20 20 12**
G 1/4"	**25**	8	19	6,5	0	**20 20 13**
G 3/8"	**23**	8	26	4,5	1	**20 30 11**
G 3/8"	**25**	8	26	5,5	1	**20 30 12**
G 3/8"	**28**	8	26	7,0	1	**20 30 13**
G 1/2"	**27**	8	26	4,5	1	**20 30 12**
G 1/2"	**29**	8	28	5,5	0	**20 40 12**
G 1/2"	**34**	8	28	8,0	0	**20 40 13**
G 3/4"	**33**	12	35	6,0	0	**20 50 11**
G 3/4"	**36**	12	35	7,5	0	**20 50 12**
G 3/4"	**42**	12	35	10,5	0	**20 50 13**
G 1"	**40**	12	35	6,5	0	**20 60 11**
G 1"	**42**	12	35	7,5	0	**20 50 12**
G 1"	**47**	12	35	10,0	0	**20 60 13**
G 1.1/8"	**45**	12	35	6,0	0	**20 50 11**
G 1.1/8"	**47**	12	37	7,0	0	**20 70 12**
G 1.1/8"	**51**	12	37	9,0	0	**20 70 13**
G 1.1/4"	**50**	12	35	6,0	0	**20 50 11**
G 1.1/4"	**52**	12	37	7,0	0	**20 70 12**
G 1.1/4"	**58**	12	35	10,0	0	**20 60 13**
G 1.3/8"	**52**	12	37	7,0	0	**20 70 12**
G 1.3/8"	**54**	12	37	8,0	0	**20 90 11**
G 1.3/8"	**59**	12	35	10,5	0	**20 50 13**
G 1.1/2"	**56**	12	35	6,0	0	**20 50 11**
G 1.1/2"	**58**	12	37	7,0	0	**20 70 12**
G 1.1/2"	**65**	12	35	10,5	0	**20 50 13**
G 1.3/4"	**63**	12	35	7,5	0	**20 50 12**
G 1.3/4"	**65**	12	37	8,5	0	**21 10 12**
G 1.3/4"	**69**	12	35	10,5	0	**20 50 13**
G 2"	**69**					by request
G 2"	**76**					by request



Determination of sealingarea diameter:

$$d_4 = 2\,(X - \Delta X + S)$$

Determination of cutting with:

$$S = \frac{d_4}{2} + \Delta X - X$$

Table 4

Screw-in bore d_1	Sealing surface diameter d_4 mm	A ⌀ mm	L mm	S mm	ΔX mm	Item no. profile steel
M 10 x 1	**15**	6	17,5	2,5	0	**20 10 11**
M 10 x 1	**20**	6	17,5	4,0	0	**22 20 11**
M 12 x 1.5	**18**	8	17,5	4,25	0	**22 30 11**
M 12 x 1.5	**25**	8	17,5	7,75	0	**22 30 12**
M 14 x 1.5	**20**	8	19	4,0	0	**22 40 11**
M 14 x 1.5	**25**	8	19	6,5	0	**20 20 13**
M 16 x 1.5	**22**	8	26	4,0	1	**22 50 11**
M 16 x 1.5	**28**	8	26	7,0	1	**20 30 13**
M 18 x 1.5	**24**	8	26	4,0	0	**22 60 11**
M 18 x 1.5	**30**	8	26	7,0	0	**22 60 12**
M 20 x 1.5	**26**	8	26	4,0	0	**22 60 11**
M 20 x 1.5	**34**	8	28	8,0	0	**20 40 13**
M 22 x 1.5	**28**	8	28	5,0	0	**22 80 11**
M 22 x 1.5	**34**	8	28	8,0	0	**20 40 13**
M 24 x 1.5	**30**	12	35	4,5	0	**22 90 11**
M 24 x 1.5	**38**	12	37	8,5	0	**21 10 12**
M 26 x 1.5	**32**	12	37	5,5	0	**23 00 11**
M 26 x 1.5	**42**	12	35	10,5	0	**20 50 13**
M 27 x 2	**33**	12	35	6,0	0	**20 50 11**
M 27 x 2	**42**	12	35	10,5	0	**20 50 13**
M 30 x 1.5	**37**	12	35	5,0	0	**23 20 11**
M 30 x 1.5	**44**	12	37	8,5	0	**21 10 12**
M 30 x 2	**37**	12	35	5,0	0	**23 20 11**
M 30 x 2	**44**	12	37	8,5	0	**21 10 12**
M 33 x 2	**40**	12	35	6,5	0	**20 60 11**
M 33 x 2	**47**	12	35	10,0	0	**20 60 13**
M 36 x 1.5	**43**	12	35	5,0	0	**23 20 11**
M 36 x 1.5	**50**	12	37	8,5	0	**21 10 12**
M 36 x 2	**43**	12	35	5,0	0	**23 20 11**
M 36 x 2	**50**	12	37	8,5	0	**21 10 12**
M 38 x 1.5	**45**	12	35	6,0	0	**20 50 11**
M 38 x 1.5	**52**	12	37	9,5	0	**23 70 11**
M 39 x 2	**47**	12	37	7,0	0	**20 70 12**
M 39 x 2	**53**	12	35	10,0	0	**20 60 13**
M 42 x 1.5	**50**	12	35	6,0	0	**20 50 11**
M 42 x 1.5	**56**	12	37	9,0	0	**20 70 13**
M 42 x 2	**50**	12	35	6,0	0	**20 50 11**
M 42 x 2	**58**	12	35	10,0	0	**20 60 13**
M 45 x 1.5	**53**	12	35	7,5	0	**20 50 12**
M 45 x 1.5	**59**	12	35	10,5	0	**20 50 13**
M 45 x 2	**53**	12	35	7,5	0	**20 50 12**
M 45 x 2	**59**	12	35	10,5	0	**20 50 13**
M 48 x 1.5	**56**	12	35	6,0	0	**20 50 11**
M 48 x 1.5	**61**	12	37	8,5	0	**21 10 12**
M 48 x 2	**56**	12	35	6,0	0	**20 50 11**
M 48 x 2	**65**	12	35	10,5	0	**20 50 13**
M 50 x 2	**65**	12	35	10,5	0	**20 50 13**
M 52 x 1.5	**61**	12	37	8,5	0	**21 10 12**
M 52 x 1.5	**65**	12	35	10,5	0	**20 50 13**
M 52 x 2	**61**	12	37	8,5	0	**21 10 12**
M 52 x 2	**65**	12	35	10,5	0	**20 50 13**
M 56 x 2	**65**	12	37	8,5	0	**21 10 12**
M 56 x 2	**69**	12	35	10,5	0	**20 50 13**
M 60 x 2	**69**					by request
M 60 x 2	**73**					by request
M 64 x 2	**73**					by request
M 64 x 2	**77**					by request
M 78 x 2	**89**					by request

*multicut** precision tools in the practical outdoor case

Whether in production, assembly or the construction site: In the practical outdoor case (see Fig. 12), you have your ***multicut**** precision tools ordered for all different applications ready for use and right next to you.

The sturdy design of the outdoor case is the perfect solution for use outside the workplace. It is made of impact-resistant ABS plastic and with a foam insert for properly storing the tools and steel profiles.

We have grouped the most often used ***multicut**** precision tools for you (see Table 5).

Outdoor cases with ***multicut**** precision tools are available in three standard designs. Please enquire separately about customized outdoor cases according to your needs such as for your customer service or service technicians. The outdoor cases are not delivered with the necessary ***multicut**** profile steels.

Fig. 12

Please get the order data you need from Tables 1 through 5.

multicut* tool	Outdoor case EK 5101 Item no. **20 01 00**	EK 5102 Item no. **20 02 00**	EK 8101 Item no. **20 03 00**
G 1/8"	*		*
G 1/4"	*		*
G 3/8"	*		*
G 1/2"	*		*
G 3/4"	*		*
G 1"	*		*
G 1.1/8"		*	
G 1.1/4"		*	*
G 1.3/8"		*	
G 1.1/2"		*	*

*multicut** MXUT measurement adapter set

The MXUT measurement adapter set expands the function of the ***multicut**** precision tools and allows the use of ***multicut**** precision tools for measurement purposes for evaluating sealing surfaces in screw-in bores.

The unique, patent-protected measurement principle allows the damage-free testing of the positional deviation (angular position) of a sealing surface relative to the middle axis of the screw-in bore.

Time- and cost-intensive measuring installations (e. g. a 3-D measuring machine) or a damaging method like “spotting” or “pressuring” with a screwed pipe are no longer needed.

The MXUT measurement adapter set can be universally used in all ***multicut**** precision tools listed in the catalogue and is delivered together with the sturdy case with foam insert for outdoor use (see Fig.13).

Table 6

MXUT measurement adapter set	Item no.
Basic adapter	28 00 01
Intermediate adapter	
Feeler lever measuring clock	
Measuring probe	
Assembly tool	


Fig. 13

Inquiry

We are interested in the ***multicut**** precision tools.

for the field of
- ❑ fabrication
- ❑ assembly
- ❑ customer service

in application to
- ❑ production
- ❑ repair/Maintenance

Sender / Stamp

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Please send us a free, non-binding estimate for the marked tool sizes and accessories:

Basic tool	Sealing surface diameter (mm)		
☐ **G 1/8"**	☐ 15	☐ 17	☐ 19
☐ **G 1/4"**	☐ 19	☐ 21	☐ 25
☐ **G 3/8"**	☐ 23	☐ 25	☐ 28
☐ **G 1/2"**	☐ 27	☐ 29	☐ 34
☐ **G 3/4"**	☐ 33	☐ 36	☐ 42
☐ **G 1"**	☐ 40	☐ 42	☐ 47
☐ **G 1.1/8"**	☐ 45	☐ 47	☐ 51
☐ **G 1.1/4"**	☐ 50	☐ 52	☐ 58
☐ **G 1.3/8"**	☐ 52	☐ 54	☐ 59
☐ **G 1.1/2"**	☐ 56	☐ 58	☐ 65
☐ **G 1.3/4"**	☐ 63	☐ 65	☐ 69
☐ **G 2"**		☐ 69	☐ 76
☐ **M 10x1**		☐ 15	☐ 20
☐ **M 12x1.5**		☐ 18	☐ 25
☐ **M 14x1.5**		☐ 20	☐ 25

Basic tool	Sealing surface diameter (mm)		
☐ **M 16x1.5**		☐ 22	☐ 28
☐ **M 18x1.5**		☐ 24	☐ 30
☐ **M 20x1.5**		☐ 26	☐ 34
☐ **M 22x1.5**		☐ 28	☐ 34
☐ **M 24x1.5**		☐ 30	☐ 38
☐ **M 26x1.5**		☐ 32	☐ 42
☐ **M 27x2**		☐ 33	☐ 42
☐ **M 30x1.5**		☐ 37	☐ 44
☐ **M 30x2**		☐ 37	☐ 44
☐ **M 33x2**		☐ 40	☐ 47
☐ **M 36x1.5**		☐ 43	☐ 50
☐ **M 36x2**		☐ 43	☐ 50
☐ **M 38x1.5**	☐ 45	☐ 52	
☐ **M 39x2**	☐ 47	☐ 53	
☐ **M 42x1.5**	☐ 50	☐ 56	
☐ **M 42x2**	☐ 48	☐ 50	

Basic tool	Sealing surface diameter (mm)	
☐ **M 45x1.5**	☐ 53	☐ 59
☐ **M 45x2**	☐ 53	☐ 59
☐ **M 48x1.5**	☐ 56	☐ 61
☐ **M 48x2**	☐ 56	☐ 65
☐ **M 50x2**		☐ 65
☐ **M 52x1.5**	☐ 61	☐ 65
☐ **M 52x2**	☐ 61	☐ 65
☐ **M 56x2**	☐ 65	☐ 69
☐ **M 60x2**	☐ 69	☐ 73
☐ **M 64x2**	☐ 73	☐ 77
☐ **M 78x2**		☐ 89

- ☐ Outdoor case EK 5101
- ☐ Outdoor case EK 5102
- ☐ Outdoor case EK 8101
- ☐ MXUT ***multicut**** measuring adapter set

08/2011