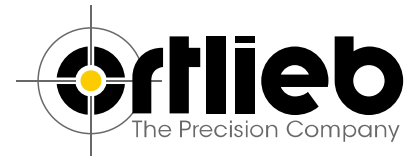


parts that will be taken out of our sales
program are crossed out



产品目录 2019
Catalogue 2019

1911 – 2011 | **100 years**

Spannsysteme
Clamping Systems



高效率- 创新，质量和精度

超过一百年Ortlieb从事精密事业，而且是以客户为导向，为其提供经济的和精密的夹持和驱动方案。

您将从我们的协同效应中得益：更多的创新，更好的能动性和灵活性通过整合的组织和生产结构，在实际上对您意味着，Ortlieb有着宽阔的产品链并且能够快速提供客户要求的解决方案。

我们设计和生产高创造性的和广泛的夹持和驱动方案对于您的生产和自动化，我们专注的技巧为您在效率，质量，利益上的跃进而准备。

德国制造是Ortlieb质量的保证，我们通过自己的灵活的生产和高要求的产品质量对此负责，不管是标准品的系列加工或者非标的单一生产，我们随时为您解决。

Ortlieb和2E mechatronic GmbH & Co., KG (www.2e-mechatronic.de)同属于Narr集团，是一个国际性的集团公司，有着大约170名员工。

Maximum Performance – Innovation, quality and precision

Since more than hundred years Ortlieb is the PRECISION COMPANY and comprehends itself as customer oriented partner for economic and precise clamping and drive solutions.

You benefit from our synergy effects: more innovation, increased dynamic and flexibility due to integrated organisation- and manufacturing structures. This means that Ortlieb is scooping from a wide product spectrum of standard solutions. Customized solutions are also fast and qualified offered.

We design and produce innovative and comprising clamping and drive solutions for your production and automation. Our concentrated know-how stands for your advance – in performance, quality and profitability.

MADE IN GERMANY is the quality assurance of Ortlieb. We pledge ourselves to that by means of our flexible production and high quality demands. Batch production of standard products or individual production of customized solutions – with pleasure we are there for you!

Ortlieb is together with 2E mechatronic GmbH & Co. KG (www.2e-mechatronic.de) part of the narr-group, an international company group with about 170 employees.

Ortlieb- 一个企业，一个目标： 提高您的产品的精度和利润

夹持系统

作为夹持技术的专家我们自1911年就为工件夹持和刀具夹持提供创新的和高可靠的解决方案。在夹持系统中一些标准化的DIN标准是基于我们研发和专利而定义的。从标准的压紧式夹钳到单个生产的非标，我们一手为您打造，Ortlieb制造

驱动系统

Ortlieb的丝杠技术(ASCA丝杠，也就是NARR丝杠)，由德国航空航天中心(DLR)研发然后由Ortlieb发展到成熟系列的

ASCA丝杠的特点就是，人们可以实现高寿命的情况下，很小的螺距（比如1mm），就此机电一体的驱动方案得以实现，而之前是不可能的。

ASCA 丝杠成为SERAC电动驱动缸的基础，依据口号**电代替油**，Ortlieb用SERAC电动缸提供创新的解决方案为了实现代替气动缸和油压缸。SERAC电动缸的好处是高的力密度和稳定性，每天在非常艰难的运行条件和不同的工业应用中得到检验。

除了SERAC标准产品Ortlieb也提供客户特殊要求的非标，欢迎垂询！

Ortlieb – one company one target: to increase the precision and profitability of your products

Clamping systems

As clamping technology specialist we are standing for innovative and high reliable solutions since 1911. Some important DIN standards in the clamping technology are documenting this as they are based on our design and patents. From standard push-type steel collets to special systems. We are offering you flexible and customized clamping solutions from one source. Made by Ortlieb!

Drive systems

Ortlieb is offering with the ASCA servospindles a spindle technology which was originally developed by the Deutsche Zentrum für Luft- und Raumfahrt e.V. (DLR). Ortlieb has developed this technology to series production readiness.

The ASCA servospindle is characterized by the possibility to realize small pitches (such as 1 mm) with high durability. Thereby it is possible to realize mechatronical drive systems which have not been possible before.

*The ASCA servospindle is the basis of the SERAC® electrical cylinder. Ortlieb is offering with these cylinders innovative solutions for the replacement of hydraulic or pneumatic cylinders according to the slogan „**electric power instead of oil**“. SERAC® electrical cylinders are characterized by high force-density and durability. They prove themselves in a lot of applications under hardest operation conditions.*

Ortlieb is also offering customized solutions beside the SERAC® standard product range. Just send us your inquiry!

创新，质量和精度- 你的精密公司

*Innovation, Quality and
Precision –
Your PRECISION COMPANY.*



令人兴奋的精度来自Ortlieb

在工件夹持领域新的研发的时候，Ortlieb专注于自己的Rubber-Flex技术作为将来的，高技术值的产品的基础，同时我们为我们的客户看到和开发了在自动化领域里显著的潜力。

我们研发，介绍以及在机床自动换刀领域里建立了一个完整的新的夹持概念，成功的发现了新的道路！

Clamping Precision from Ortlieb

Ortlieb is focusing the Rubber-Flex® technology at new workpiece clamping designs in order to develop high value products. We see simultaneously enormous potential for our customers in the automation.

We have successfully found a new way with the development, introduction and establishment of a total new clamping system for automatic tool changing in machine tools. This for your benefit!

夹持解决方案

对于车削和铣削范围夹持方案的要求是非常明确的定义了，特别好的旋转跳动精度和重复精度，显著的吸震效果，高的径向夹持力矩转换，从工件夹具到自动拉刀爪以及工件自动装置我们一手供应您几乎所有理想的夹持方案，就此我们科学的调整了我们的产品链。

在夹持方案的研发的时候，我们主要着眼于紧凑的尺寸和系统的精度和使用寿命，通过紧凑的外形和由此产生的重量的减轻我们不但扩大了机床的工作空间而且也延长的机床主轴的使用寿命，对此工件夹持和刀具夹持都是这样的。

我们不但夹持而且松开-电动松开单元EML，在这个产品，两种产品夹持系统和驱动系统的协作得到体现，仅仅需要使用ASCA丝杠副，紧凑的和长寿命的电动松开缸的设计成为可能，这个系统成倍的成功的应用坚定了我们一直发展电动夹持和松开系统。

生产性-生产效率一直是我们的关心的，提高生产效率的一步是减少停机的时间和机床更换的时间，我们怎么样能给您帮助呢？非常简单-请使用我们的密封的和延长维护间隔的卡盘。或者使用我们免维护的拉刀爪，或者非标夹具WSA，能和零件一起用机器手在加工中心里更换的卡盘。

您有兴趣吗？那么联系我们吧！

Clamping Solutions

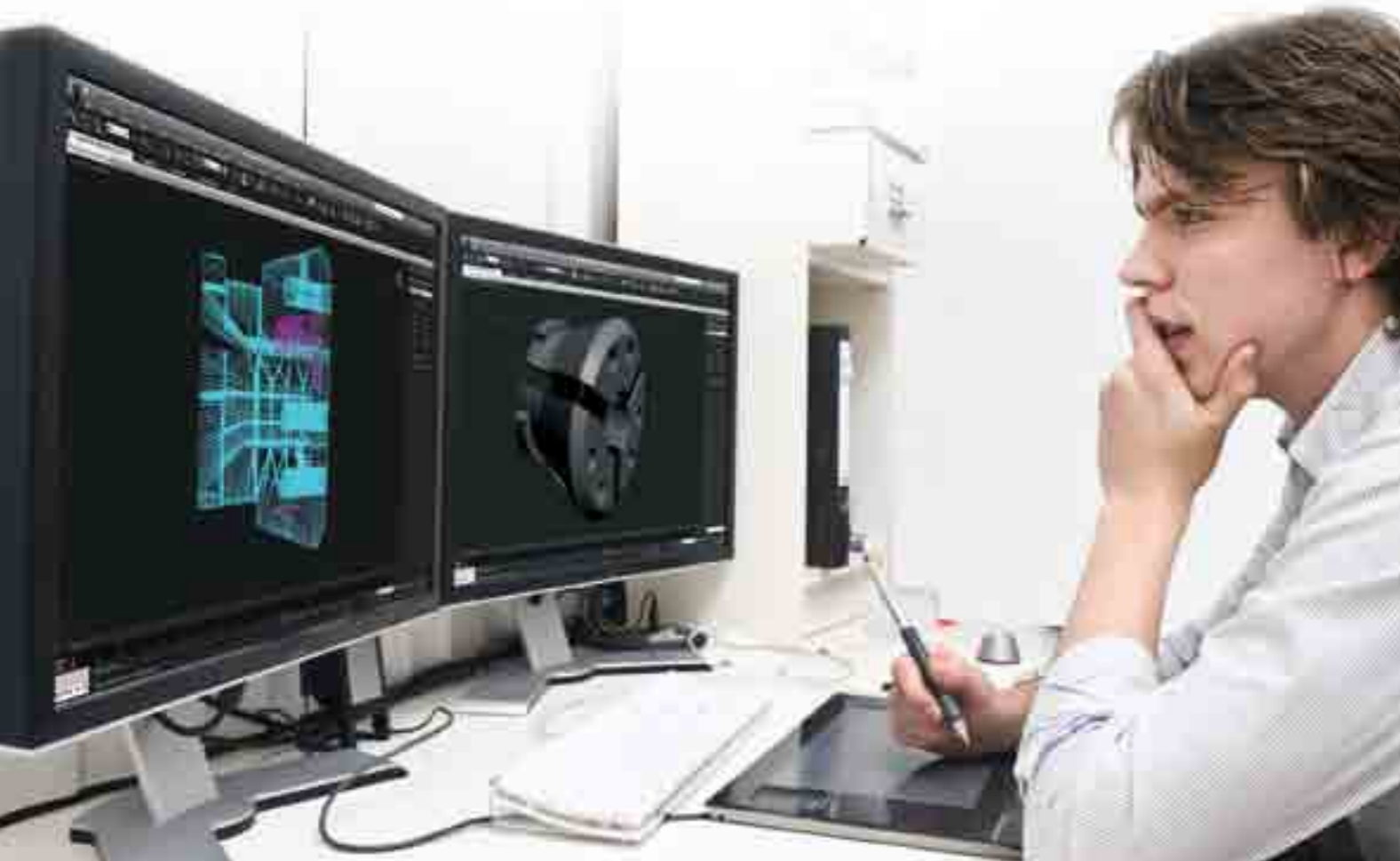
The requirements for turning and milling applications are clearly defined: highest concentricity, and repeat-accuracy, outstanding vibration absorption, highest torque and radial force transmission. Our product range is optimal concentrated on these requirements. We are offering the ideal clamping solution for most applications in workpiece clamping, automatic tool clamping and workpiece automation from one source.

We are concentrating ourselves on compact dimensions and durability when developing these clamping solutions. We are not only extending the working space in your machine tool as the durability of your spindle is also extended by the reduced dimensions and weight of the systems. This is valid for workpiece clamping as well as for automatic tool clamping.

We are not only clamping, we are also releasing – with our electromechanical release unit EML. The synergy from our product divisions „clamping systems“ and „drive systems“ is getting evident with that product. It was only possible to design such a compact and durable electromechanical release unit by the use of our ASCA servospindle. The numerous operation of the system is encouraging us on our way to electromechanical clamping and release units.

Profitability – this business ratio is escorting you and us since a long time. The reduction of downtime and change-over time of your machine tool is one step to increase this ratio. How we can support you? It is very simple – just use one of our sealed clamping chuck with extended maintenance interval. Or use our maintenance-free tool gripper with ceramic. Or use our special clamping device WSA which can be changed in the machine together with the clamped workpiece by means of a robot.

Are you interested? Just give us a call!





索引 / Content



完美的工件夹持技术

为了一个安全的工件的加工，我们提供给市场 QUADRO 和 SPANNAX。一个多样的产品系列，QUADRO 是专门给数控车床上工件夹持使用而研发的，SPANNAX 是一个对于在车床，铣床，旋转类的机床上是一个完美的选择。

Workpiece Clamping in Perfection

Our brands QUADRO® and SPANNAX® are offering a manifold product range for the safe machining of workpieces. QUADRO® is specially developed for workpiece clamping on CNC lathes. SPANNAX® is the perfect choice for operation on lathes, milling machines, revolving transfer machines etc.

自动刀具夹持

Ortlieb 拉刀爪已经几十年来在多种的著名的机床主轴上通过 HSK, SK, PSC 连接单元成功的被应用。

Automatic Tool Clamping

The Ortlieb grippers are successfully used in numerous well-respected machine tool spindles for automatic tool changing of HSK, SK and PSC tools.

刀具夹持

Rubber-Flex® 独一无二的性价比是一个绝对的标志，而这个性价比在刀具夹持技术来说是不能撇开不考虑的。它们对于整体的切削工艺来说最适合在加工中心上使用，灵活的加工生产线，以及现代的车床，车削中心。

Tool Clamping

Rubber-Flex® is a top brand with an outstanding price / performance ratio. This brand is a rudimental part of the tool clamping technology of today. It is ideal for use in machining centres, flexible production centres, modern lathes and rotation centres.

工件自动化 WSA

工艺时间显著的缩短是通过自动化，通过带有适配的零件夹持技术的工件自动化 WSA，复杂零件的完全加工在一次装夹上得以实现。欢迎详询根据客户要求实现的对于自动化工件更换的非标夹具。

Workpiece Automation WSA

Drastic process shortening by automation. The workpiece automation WSA allows a complete machining of complex workpieces in one clamping by means of adaptive workpiece clamping technology. Please contact us for our customised clamping solutions for automatic workpiece change.

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工件夹持
Workpiece Clamping



自动拉刀系统
Automatic Tool Clamping



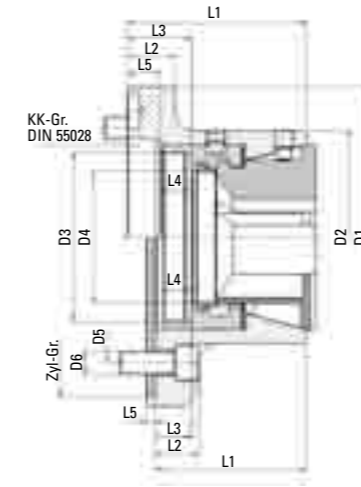
刀具夹持
Tool Clamping



工件自动化
Workpiece Automation



SPANNAX® 卡盘 SPANNAX® Collet Chucks



SPANNAX® 对于车, 铣, 旋转类机床的夹持系统

这种夹持系统是在车床, 磨床, 铣床, 旋转类机床上应用的。当作通孔也是可以的, 卡盘的部件是根据应用组合起来的。仅仅需要的是最大的工件外径和您机床的主轴连接尺寸。

您可以自己生产连接适配器, 合适的毛坯件您可以在第21页找到。

当然我们也很乐意为您的机床制造连接适配器, 请您就此发给我们主轴图纸或者请使用25页的表格。

Die SPANNAX® 这种后拉式的卡盘有下列几种形式:

- 对于棒料的通孔式卡盘
- 使用可更换的固定止动块卡盘对于嵌入部件以及棒料
- 使用可更换的固定止动块轴向零位移卡盘对于嵌入部件以及棒料
- 机床特殊要求的非标解决方案

您的效益:

- 安全的夹持由稳定的夹持力实现, 同样在提高的转速的情况下。
- 高的刚性由于夹固头平行面夹持
- 您的生产机床更佳的灵活性由于更大的夹持范围。
- 更大的工作空间由于紧凑的建造形式和更少的干涉

SPANNAX® Chucking System for Turning, Milling and Indexing Table Machines

This compact chucking system can be used on turning, grinding, milling and indexing table machines. You can compose the individual chuck components as required due to the modularity of the system. All you need is the maximum work piece diameter and the size of the spindle nose of your machine.

The appropriate adapter can be manufactured by yourself. You will find corresponding adapter blanks on page 21.

Of course we are pleased to produce the adapter for your machine. Just send us the spindle dimensions or fax the filled-out form on page 25.

The SPANNAX® Chucks are available in the following design:

- Through hole chuck for bar machining
- Endstop chuck with removable endstop for insert parts and bar processing
- DL-chuck with removable endstop for position-neutral clamping of insert parts and bar material
- Machine specific special solutions on request

Your benefit:

- Safe clamping by constant clamping force also at increasing rotational speed
- High rigidity by parallel clamping of clamping heads
- Increased flexibility of your production machine due to large clamping range
- Extension of working space due to compact design and reduction of interfering edges

SPANNAX® 通孔卡盘 现在更紧凑更轻对于在主轴上的棒料加工

SPANNAX® SlimLine Through Hole Chuck even more compact and lighter for bar material machining on main-spindel

类型 type	订货号 item no.	尺寸 size	主轴尺寸 Zyl.-Gr.	D1	D2	D3	D4	D5	D6	L1	L2	L3	L4	L5	重量 weight [kg]	最大转速* rpm* max. [min ⁻¹]
TSL42/5D	036.8101/00	42	A2-5	130	95	M66x1,5	45	104,8	M10 (4x90°)	85	20	34,5	15	16,5	3,2	8000
TSL42/6D	036.8102/00	42	A2-6	160	95	M66x1,5	45	133,4	M12 (4x90°)	85	20	34,5	15	17,5	4,8	8000
TSL42/140D	036.8103/00	42	140	150	95	M66x1,5	45	104,8	M10 (3x120°)	70	55	15	15	5	3,4	8000
TSL52/5D	036.8104/00	52	A2-5	130	95	M66x1,5	55	104,8	M10 (4x90°)	89	20	34,5	15	16,5	3,1	8000
TSL52/6D	036.8105/00	52	A2-6	160	95	M66x1,5	55	133,4	M12 (4x90°)	89	30	34,5	15	17,5	4,7	8000
TSL52/140D	036.8106/00	52	140	150	95	M66x1,5	55	104,8	M10 (3x120°)	74	17	15	15	5	3,3	8000
TSL65/6D	036.8107/00	65	A2-6	160	113	M90x1,5	70	133,4	M12 (4x90°)	95	25	34	15	17,5	4,7	8000
TSL65/8D	036.8108/00	65	A2-8	202	113	M90x1,5	70	171,4	M16 (4x90°)	100	35	39	15	20	7,7	8000
TSL65/170D	036.8109/00	65	170	180	113	M90x1,5	70	133,4	M12 (6x60°)	80	20	19	15	5	5,0	8000
TSL80/8D	036.8110/00	80	A2-8	202	130	M102x1,5	85	171,4	M16 (6x60°)	100	35	39	15	20	4,6	7000

* 动平衡
凸轮锁扣和进一步的卡盘类型欢迎垂询。

* unbalanced
Camlock and other types on request.

您的效益:

- 明显的减少的尺寸和重量, 从而保护主轴
- 明显减少的干涉轮廓, 就此更好的零件通路
- 被提高的跳动精度到0.005mm, 因为卡盘本体一体
- 更高被允许的转速到8000min⁻¹ (Gr42&Gr65)
- 特别简易安装和免维护, 完全密封

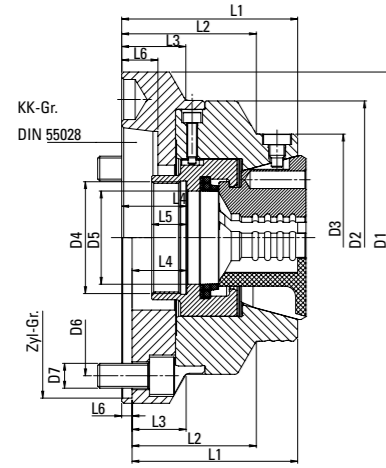
Your benefit:

- Considerable reduced measures and torque of inertia thereby spindle preserving
- Considerable reduced interfering edges thereby increased accessibility of workpiece
- Increased runout up to 0,005 mm due to one-piece chuck body
- Higher revolution speed up to 8000 min⁻¹ (size 42 & 65)
- Extreme setting friendly and service reduced, completely sealed



S. 14

S. 16



SPANNAX® 通孔卡盘
理想适合在主轴上的棒料加工

SPANNAX® Through Hole Chuck
Ideal for bar material machining
on main-spindle

类型 type	订货号 item no.	尺寸 size	主轴尺寸 Zyl.-Gr.	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	最大转速 rpm* rpm* max. [min ⁻¹]
TS42/5D	036.8010/00	42	A2-5	132	-	100	M54x1,5	45	104,8	M10 (4x90°)	90	70	-	36,5	17	16,5	7000
TS42/6D	036.8011/00	42	A2-6	160	132	100	M54x1,5	45	133,4	M12 (4x90°)	90	70	36	36,5	17	17,5	7000
TS42/140D	036.8012/00	42	140	150	132	100	M54x1,5	45	104,8	M10 (4x90°)	75	55	15	21,5	17	6	7000
TS65/5D	036.8020/00	65	A2-5	157	-	122	M78x1,5	68,5	104,8	M10 (4x90°)	100	70	-	39	17,5	19	6000
TS65/6D	036.8021/00	65	A2-6	157	-	122	M78x1,5	68,5	133,4	M12 (4x90°)	98	68	-	37	17,5	17,5	6000
TS65/8D	036.8022/00	65	A2-8	202	157	122	M78x1,5	68,5	171,4	M16 (4x90°)	102	72	47	41	17,5	20	6000
TS65/140D	036.8023/00	65	140	157	-	122	M78x1,5	68,5	104,8	M10 (4x90°)	100	70	-	39	17,5	5	6000
TS65/170D	036.8024/00	65	170	180	157	122	M78x1,5	68,5	133,4	M12 (4x90°)	98	68	13	37	17,5	5	6000
TS100/170D	036.9028/00	100	170	215	-	180	M95x2,0	87	133,4	M12 (6x60°)	110	89	-	31	25	6	5000
TS100/220D	036.9029/00	100	220	230	215	180	M95x2,0	87	171,4	M16 (6x60°)	110	89	31,5	31	25	6	5000

* 动平衡
凸轮锁扣和进一步的卡盘类型欢迎垂询。

* unbalanced
Camlock and other types on request.

您的效益:

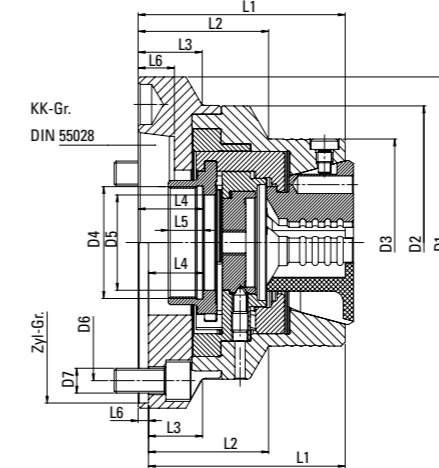
- 工作空间的扩大由于紧凑的建造形式和干涉的减少
- 主轴的保护由于很少的离心力
- 很大的夹持力
- 安装方便
- 免维护因为密封

Your benefit:

- Extension of working space due to compact design and reduction of interfering edges
- Spindle preserving by small centrifugal force
- High clamping force
- Short changeover time
- Service reduced by sealing



S. 14 S. 16



SPANNAX® 带通孔的止动型卡盘 (可拆卸的止动块)

理想适合在主轴上加工嵌入件和棒料

SPANNAX® Endstop Chuck with Full Passage (removable endstop)

Ideal for processing of insert parts and bar material on main spindle

类型 type	订货号 item no.	尺寸 size	主轴尺寸 Zyl.-Gr.	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	最大转速 rpm* rpm* max. [min ⁻¹]
TS42/5A	036.8030/00	42	A2-5	132	-	100	M54x1,5	46	104,8	M10 (4x90°)	105	68	-	36,5	17	16,5	7000
TS42/6A	036.8031/00	42	A2-6	160	132	100	M54x1,5	46	133,4	M12 (4x90°)	105	68	36	36,5	17	17,5	7000
TS42/140A	036.8032/00	42	140	150	132	100	M54x1,5	46	104,8	M10 (4x90°)	90	53	15	21,5	17	6	7000
TS65/5A	036.8040/00	65	A2-5	157	-	122	M78x1,5	68	104,8	M10 (4x90°)	112	69	-	39	17,5	19	6000
TS65/6A	036.8041/00	65	A2-6	157	-	122	M78x1,5	68	133,4	M12 (4x90°)	110	67	-	37	17,5	17,5	6000
TS65/8A	036.8042/00	65	A2-8	202	157	122	M78x1,5	68	171,4	M16 (4x90°)	114	71	47	41	17,5	20	6000
TS65/140A	036.8043/00	65	140	157	-	122	M78x1,5	68	104,8	M10 (4x90°)	112	69	-	39	17,5	5	6000
TS65/170A	036.8044/00	65	170	180	157	122	M78x1,5	68	133,4	M12 (4x90°)	110	67	13	37	17,5	5	6000
TS100/170A	036.9034/00	100	170	215	-	180	M95x2,0	87	133,4	M12 (6x60°)	159	138	-	31	25	6	3800
TS100/220A	036.9035/00	100	220	230	215	180	M95x2,0	87	171,4	M16 (6x60°)	159	138	31	31	25	6	3800

* 动平衡
凸轮锁扣和进一步的卡盘类型欢迎垂询。

* unbalanced
Camlock and other types on request.

您的效益:

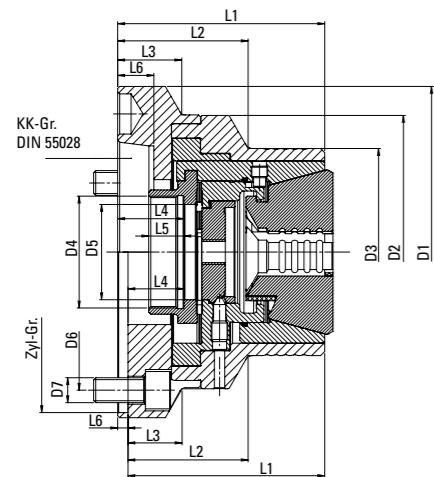
- 高精度的轴向数据由于工件通过后拉紧靠止动块
- 主轴的保护由于很少的离心力
- 很短的更换为通孔的时间由于可以快速更换的止动块

Your benefit:

- Highest axial reference of workpieces due to axial pull-back movement on endstop
- Spindle preserving by small centrifugal force
- Short changeover time from endstop to through hole by quick changeable endstop



S. 14 S. 16



SPANNAX® 轴向零位移夹持卡盘理想适合理想适合在主轴和副主轴上加工嵌入件和棒料

SPANNAX® DL-Dead Length Chuck "Combi" for positionneutral clamping
Ideal for processing of insert parts and bar material on main and sub-spindle

类型 type	订货号 item no.	尺寸 size	主轴尺寸 Zyl.-Gr.	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	最大转速* rpm max. [min ⁻¹]
TS32/4DL	036.9625/00	32	A2-4	105	100	75,5	M40x1,5	33	82,6	M10 (3x120°)	100,8	65,8	50	34,5	15	14,5	8000
TS32/5DL	036.9626/00	32	A2-5	130	100	75,5	M40x1,5	33	104,8	M10 (3x120°)	100,8	65,8	26	34,5	15	16,5	8000
TS32/120DL	036.9627/00	32	120	130	100	75,5	M40x1,5	33	102	M8 (6x60°)	83	49	15	17	15	6	8000
TS42/5DL	036.9061/00	42	A2-5	132	-	100	M54x1,5	46	104,8	M10 (4x90°)	105	68	-	37	17	16,5	7000
TS42/6DL	036.9062/00	42	A2-6	160	132	100	M54x1,5	46	133,4	M12 (4x90°)	105	68	36	37	17	17,5	7000
TS42/140DL	036.9069/00	42	140	150	132	100	M54x1,5	46	104,8	M10 (4x90°)	90	53	15	22	17	6	7000
TS65/5DL	036.9063/00	65	A2-5	157	-	122	M78x1,5	68	104,8	M10 (4x90°)	112	69	-	39,5	17,5	19	6000
TS65/6DL	036.9070/00	65	A2-6	157	-	122	M78x1,5	68	133,4	M12 (4x90°)	110	67	-	37,5	17,5	17,5	6000
TS65/8DL	036.9065/00	65	A2-8	202	157	122	M78x1,5	68	171,4	M16 (4x90°)	114	71	47	41,5	17,5	20	6000
TS65/140DL	036.9611/00	65	140	157	-	122	M78x1,5	68	104,8	M10 (4x90°)	112	69	-	39,5	17,5	5	6000
TS65/170DL	036.9612/00	65	170	180	157	122	M78x1,5	68	133,4	M12 (4x90°)	110	67	13	37,5	17,5	5	6000

* 动平衡
凸轮锁扣和进一步的卡盘类型欢迎垂询。

* unbalanced
Camlock and other types on request.

您的效益:

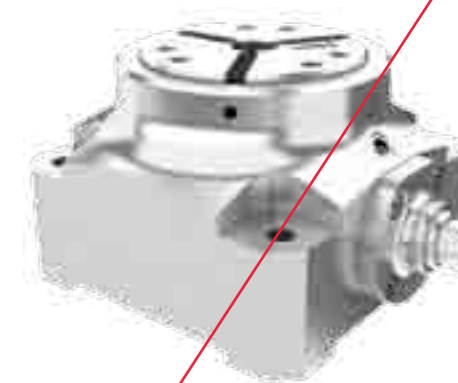
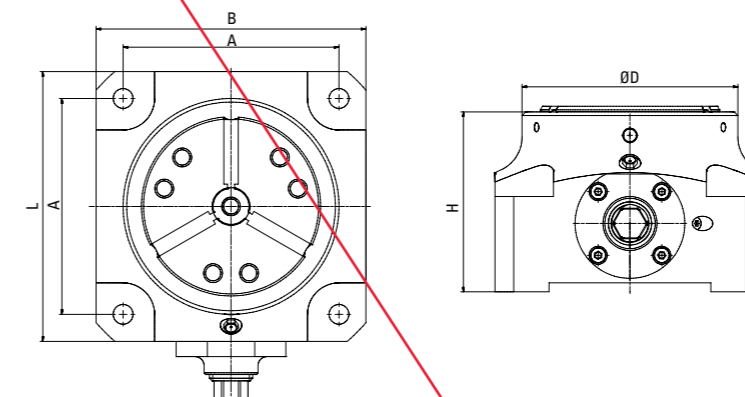
- 工作空间的扩大由于紧凑的建造形式和干涉的减少
- 主轴的保护由于很少的离心力和没有轴向力的夹持
- 很短的更换为通孔的时间由于可以快速更换的止动块
- 免维护因为密封

Your benefit:

- Extension of working space due to compact design and reduction of interfering edges
- Spindle preserving by small centrifugal force and axial-force free clamping
- Short changeover time from endstop chuck to through hole chuck by quick-changeable endstop
- Service reduced by sealing



S. 14 S. 16



NEU! / NEW!

SPANNAX® SSM

这个手动静止卡盘 SPANNAX® SSM 特别适合钻、铣和加工中心或者样机和模型，这种卡盘不但能水平而且能垂直装载和令人信服的夹持力和刚性和安装简便性，这个卡盘可以通过 SW17 扳手驱动，扳手可以 180 度旋转，更理想的这个卡盘可以用上前止动块和内置止动块。

SPANNAX® SSM
Manual stationary chucks

The manual stationary chucks SPANNAX® SSM are specially suitable for use in drilling, milling and machining centers as well as prototype manufacturing. The SSM chucks can be mounted vertical as well as horizontal. They convince with highest clamping force, rigidity and they are easy to assemble. The chuck is operated with a standard flat wrench SW 17 (not included in delivery) which has to be slewed by max. 180°. The chucks can be optionally equipped with front or internal end stop.

类型 type	订货号 item no.	夹持-Ø clamping dia. [mm]	尺寸 size	A [mm]	L [mm]	B [mm]	H [mm]	D [mm]	重量 weight [kg]
SSM 32	036.7004/50	4-32	32	80	110	110	100	80	5,9
SSM 42	036.7005/00	4-42	42	100	130	130	100	100	7,9
SSM 52	036.7006/00	6-52	52	100	130	130	100	100	7,6
SSM 65	036.7007/00	4-65	65	120	150	150	100	120	9,6
SSM 80	036.7008/00	5-80	80	135	165	165	110	135	12,7
SSM 100	036.7009/00	40-100	100	170	200	200	110	165	17,5

您的效益:

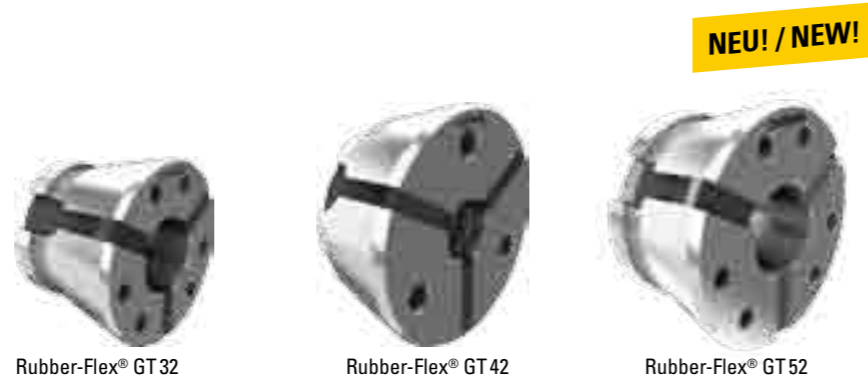
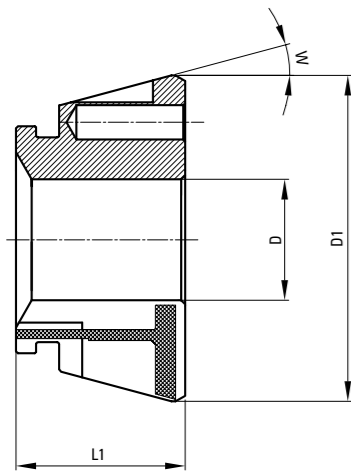
- 安装简便，很少的安装时间
- 重复精度 ≤ 0.01mm
- 后拉到止动块，就此工件的刚性化。
- SPANNAX® GT 夹固头的使用，夹持范围 ± 0.5mm
- 紧凑的建造，就此更少的干涉
- 理想对于 5 轴加工

Your benefit:

- Short set-up time due to easy assembly
- High runout ≤ 0,01 mm
- Pull down-effect on end stop is stabilizing the workpiece
- Clamping tolerance nominal diameter ± 0,5 mm by using SPANNAX® GT clamping heads
- Compact design therefore reduced interfering edges
- Ideal for 5-axis machining



S. 14 S. 16



Rubber-Flex® GT 夹固头

GT夹固头是基于Rubber-Flex® 理论的和并且就此有一个被提高的夹持公差 ± 0.5mm圆形，四边，或者六边以及平滑，横纹长纹孔都有供货，另外的形状欢迎垂询。棒料将左夹头里用长纹和横纹夹持，已经加工好了的工件用干滑孔在旋转跳动精度≤ 10 μ 下高精度夹持。

您的效益:

- 更短的换夹时间通过手动气动换爪器
- 更少的更换由于夹持公差 ± 0.5mm
- GT80 和GT100的6瓣设计从而有更大的夹持力
- 非标形状欢迎垂询

SPANNAX Rubber-Flex® GT 夹固头，自车式 (端面和内孔是软的)

尺寸 size	D 圆/平滑 "D" round/smooth [mm]	订货号 item no.	D1 [mm]	L [mm]	W [°]
32	5, 10, 20	T0032WR...G	57,7	44	12
42	5, 15, 32	T0042WR...G	79,3	42	15
52	8, 15, 30	T0052WR...G	79,2	46	15
65	8, 20, 30, 42	T0065WR...G	99,5	53	15
80	8, 20, 40, 60	T0080WR...G	114,5	53	15
100	30, 45, 65, 90	T0100WR...G	144,5	59	15

订货举例: GT 65 圆的, 30mm = T0065WR030000G

Rubber-Flex® GT Clamping Heads

The GT clamping heads are based on the Rubber-Flex® principle and have therefore clamping tolerance of ± 0,5 mm. They are available in round, square and hexagonal design as well as with smooth, serrated or double serrated bore. Other profiles on request! Bar material is clamped in clamping heads with serrated or double serrated bore. Pre-processed or sensitive workpieces are clamped precisely in clamping heads with smooth bore with a runout tolerance ≤ 10 μ.

Your benefit:

- Short changeover time by use of manual or pneumatic changing devices
- Less changeover by clamping tolerance ± 0,5 mm
- The hexamerous design of GT 80 and GT 100 results in additional increased clamping force
- Special profiles on request

SPANNAX Rubber-Flex® GT emergency clamping heads

Order sample: GT 65 round, 30 mm = T0065WR030000G

新的带六瓣
NEW with 6 segments!



尺寸 size	具体大小 dimensions	形状	订货号 item no.	D 平滑 "D" smooth [mm]	D 横纹 "D" serrated [mm]	D 长纹和横纹 "D" double serrated [mm]	台阶 increments [mm]
32	D1 = 57,7 L1 = 44,0 W = 12°	○	T0032R...G	4-32	-	-	1,0
			T0032R...Q	-	8-10	-	1,0
			T0032R...L	-	-	11-32	1,0
		◇	T0032V...G	7	-	-	1,0
			T0032V...Q	-	8-22	-	1,0
			T0032S...G	7	-	-	1,0
42	D1 = 79,3 L1 = 42,0 W = 15°	○	T0042R...G	4-42	-	-	0,5
			T0042R...Q	-	8-10	-	1,0
			T0042R...L	-	-	11-42	1,0
		◇	T0042V...G	7	-	-	1,0
			T0042V...Q	-	-30	-	1,0
			T0042S...G	7	-	-	1,0
52	D1=79,2 L=46,0 W=15°	○	T0052R...G	6-52	-	-	0,5
			T0052R...Q	-	8-11	-	1,0
			T0052R...L	-	-	12-52	1,0
		◇	T0052V...G	-	8-36	-	1,0
			T0052V...Q	-	33-46	-	1,0
			T0052S...G	7	-	-	1,0
65	D1 = 99,5 L1 = 53,0 W = 15°	○	T0065R...G	4-65	-	-	0,5
			T0065R...Q	-	8-10	-	1,0
			T0065R...L	-	-	11-65	1,0
		◇	T0065V...Q	-	8-46	-	1,0
			T0065S...G	7	-	-	1,0
			T0065S...Q	-	8-56	-	1,0
80	D1 = 114,5 L1 = 53,0 W = 15°	○	T0080R...G	10-80	-	-	1,0
			T0080R...Q	-	10	-	1,0
			T0080R...L	-	-	11-80	1,0
		◇	T0080V...Q	-	10-56	-	1,0
			T0080S...G	7	10-42	-	1,0
			T0080S...Q	-	43-68	-	1,0
100	D1 = 144,5 L1 = 59,0 W = 15°	○	T0100R...G	40-100	-	-	1,0
			T0100R...Q	-	-	-	1,0
			T0100R...L	-	-	40-100	1,0
		◇	T0100V...Q	-	50-70	-	1,0
			T0100S...G	-	50-86	-	1,0
			T0100S...Q	-	-	-	1,0

订货举例: GT65 圆的, 30mm 平滑= T0065R030000G

Order sample: GT 65 round, 30 mm smooth = T0065R030000G





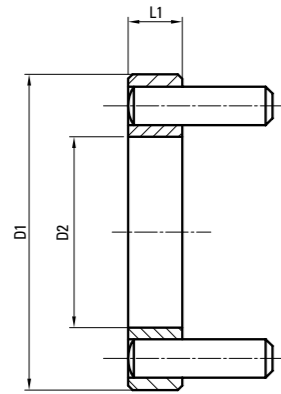
手动换爪器
Manual Changing Devices

类型 type	订货号 item no.
WM 32	036.9961/00
WM 42	036.9962/00
WM 52	036.9963/00
WM 65	036.9964/00
WM 80	036.9971/00



手动换爪器
Pneumatic Changing Devices

类型 type	订货号 item no.
WP 42	036.9950/00
WP 65	036.9951/00
WP 80	auf Anfrage / on request
WP 100	036.9952/00



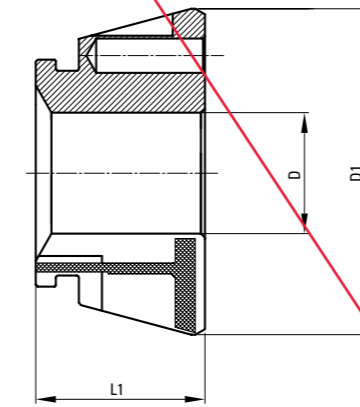
自车环

为了调整Rubber-Flex® GT夹固头软爪内部尺寸，这时候将用到自车环。自车环的销放进夹固头，在夹固头被夹紧以后，就可以加工内孔。

类型 type	类型 type	大小 size	D1 [mm]	D2 [mm]	L1 [mm]
AD 32	S416703	32	54	34	12
AD 42	S416701	42	70	43	12
AD 65	S416700	65	95	63	15
AD 80	S416704	80	110	78	15
AD 100	S416702	100	142	105	18

Turning Fixtures

Turning fixtures for modifying the clamping diameter of Rubber-Flex® GT emergency clamping heads. For that purpose the pins of the turning fixture are inserted in the changing bores of the clamping head. The clamping bore can be machined as soon as the clamping head is clamped.



Rubber-Flex® GT 夹固头

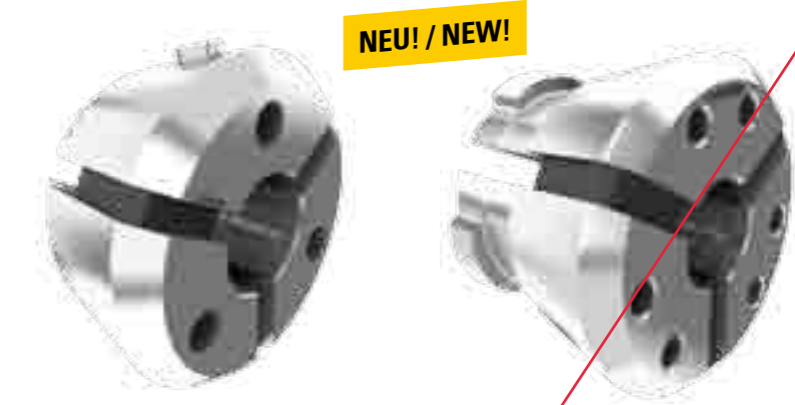
因为大量客户的需求我们这边可以立刻32型多轴夹固头供货：

- Gildemeister 32
- Index MS 32
- Schütte 32

多轴夹固头基于Rubber-Flex® 硫化橡胶技术和可以四边，圆形或者六边供货，另外的形状可以询问。

您的效益：

- 通过手动换爪器可以快换夹头
- 高的旋转跳动精度≤0.01mm
- 夹持公差±0.5mm
- 通过橡胶密封延长维护间隔



Rubber-Flex® GT 32 Gildemeister/Schütte

Rubber-Flex® GT 32 Index

Rubber-Flex® GT clamping heads

From now on we are offering Rubber-Flex® GT clamping heads size 32 for the following multispindle machines due to numerous customer requests:

- Gildemeister 32
- Index MS 32
- Schütte 32

The multispindle clamping heads are also based on the Rubber-Flex® vulcanising technology. They are available in round- square- or hexagonal profile design. Other profiles on request.

Your benefit:

- Short changeover time by use of manual changing device
- High runout ≤ 0,01 mm
- Clamping tolerance nominal diameter ± 0,5 mm
- Prolonged service intervals due to vulcanized sealing lips

大小 size	机床类型 machinetype	尺寸 dimensions [mm]	形状	订货号 item no.	"D" 平滑 "D" smooth [mm]	"D" 横纹 "D" serrated [mm]	"D" 长横纹 "D" double serrated [mm]	递增 increments [mm]
32	Gildemeister 32 Schütte 32	D1 = 69,7 L1 = 43	○	TMC32R...G	6-7	-	-	1,0
				TMC32R...Q	-	8-11	-	1,0
				TMC32R...L	-	-	12-32	1,0
			◇	TMC32V...G	7-22	-	-	1,0
				TMC32V...Q	-	10-22	-	1,0
				TMC32S...G	7-28	-	-	1,0
	Index MS32	D1 = 61 L1 = 47	○	TMS32R...G	5-7	-	-	1,0
				TMS32R...Q	-	8-11	-	1,0
				TMS32R...L	-	-	12-32	1,0
			◇	TMS32V...G	7-22	-	-	1,0
				TMS32V...Q	-	10-22	-	1,0
				TMS32S...G	7-27	-	-	1,0
○	TMS32S...Q	-	10-27	-	1,0			

订单举例：
GT 32 f. Index MS32 rund, 20 mm glatt = TMS32R020000G

order sample:
GT 32 f. Index MS32 round, 20 mm smooth = TMS32R020000G



内涨芯轴系统

内涨芯轴CenterGrip是不带拉栓的。这样的话盲孔可以一直夹到底。

6瓣的涨套 (CG30=3瓣) 基于可靠的Rubber-Flex® 硫化橡胶技术, 并且提供最大的夹持长度51.5mm, 并且每个毫米一个涨套, 其中有偏差的夹持直径和轮廓欢迎垂询。

这个夹持系统进一步的特点是大的夹持范围±0.5mm, 通过可以快换的止动块和涨套的插旋式连接, 这个系统能被特别快速的更换。3个不同种类紧凑的内涨芯轴根据相适应的涨套可以满足15-80mm的夹持范围。

零件通过后拉式的效应可靠的紧贴在止动块上, 这个也是非常适合单循环气检的, 能够保证一个安全的自动零件更换。

这个止动块 (软的) 可以提供的, 客户当地可以加工。

当然我们很愿意为您的机器制造连接器, 请发给我们你们机床的主轴图。或者使用第25页的表格。

Cone Expanding Mandrel CenterGrip

The cone expanding mandrel CenterGrip is designed without a draw bolt. Therefore it is also possible to clamp the whole length of blind holes.

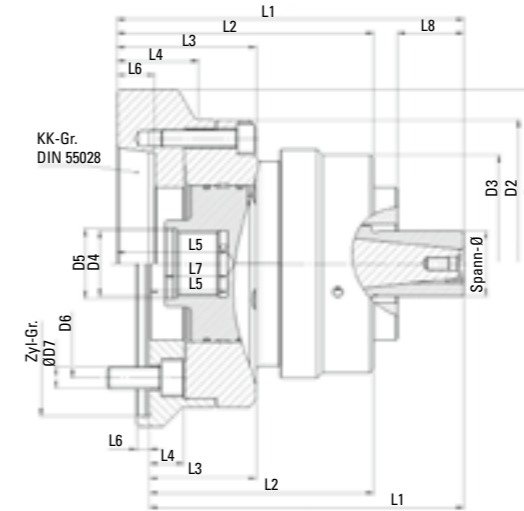
The 6-segmented sleeves (CG30 = 3 segments) are based on the reliable Rubber-Flex® vulcanising technology and offers a maximum clamping length of 51,5 mm with 1 mm increments of the clamping diameter. Other clamping diameters and contours on request.

Furthermore the clamping tolerance amounts to ± 0,5 mm of nominal diameter. The change over time of the system is extremely reduced due to quick-change endstops and sleeves. Three different compact basic mandrels are covering the clamping range from 15 – 80 mm.

The workpieces are pulled on the endstop by means of the sleeve. It is also possible to integrate a single-circuit air sensing system in the endstop for operation with automatic feeding systems.

The endstops are also available in soft design for machining at site.

Of course we are pleased to produce the adapter for your machine. Just send us the spindle dimensions or fax the filled-out form on page 25.



NEU! / NEW!

类型 type	订货号 item no.	夹持直径 clamping Ø	主轴 Zyl.-Gr.	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	L7	L8	Drehzahl* rpm* max. [min ⁻¹]
CG30/5	057.1102/00	18-35	A2-5	132	132	93	M30x1,5	32	104,8	M10 (4x90°)	137	120	61	-	51	16,5	30	23	5000
CG30/6	057.1103/00	18-35	A2-6	160	132	93	M30x1,5	32	133,4	M12 (4x90°)	137	120	61	36	51	17,5	30	23	5000
CG30/140	057.1104/00	18-35	140	150	132	93	M30x1,5	32	104,8	M10 (4x90°)	122	105	46	15	36	6	30	23	5000
CG50/5	057.1202/00	30-55	A2-5	132	132	100	M30x1,5	32	104,8	M10 (4x90°)	160	119	64	-	51	16,5	29	41,5	5000
CG50/6	057.1203/00	30-55	A2-6	160	132	100	M30x1,5	32	133,4	M12 (4x90°)	160	119	64	36	51	17,5	29	41,5	5000
CG50/140	057.1204/00	30-55	140	150	132	100	M30x1,5	32	104,8	M10 (4x90°)	145	104	49	15	36	6	29	41,5	5000
CG80/5	057.1302/00	45-80	A2-5	132	132	114	M30x1,5	32	104,8	M10 (4x90°)	175	124	75	-	47	16,5	25	51,5	5000
CG80/6	057.1303/00	45-80	A2-6	160	132	114	M30x1,5	32	133,4	M12 (4x90°)	175	124	75	36	47	17,5	25	51,5	5000
CG80/8	057.1305/00	45-80	A2-8	202	132	114	M30x1,5	32	171,4	M16 (4x90°)	179	128	79	47	51	20	25	51,5	5000
CG80/140	057.1304/00	45-80	140	150	132	114	M30x1,5	32	104,8	M10 (4x90°)	160	109	60	15	32	6	25	51,5	5000
CG80/170	057.1306/00	45-80	170	180	132	114	M30x1,5	32	133,4	M12 (4x90°)	160	109	60	18	32	6	25	51,5	5000

* 动平衡
进一步的机床连接欢迎垂询。

* unbalanced
Other machine interfaces on request.

您的利益:

- 少的更换时间, 因为涨套快换连接。
- 高的旋转跳动精度≤0.01mm
- 夹持公差±0.5mm
- 紧凑的建造方法, 帮助更少的干涉。
- 非常适合单循环气检的, 能够保证一个安全的自动零件更换。

Your benefit:

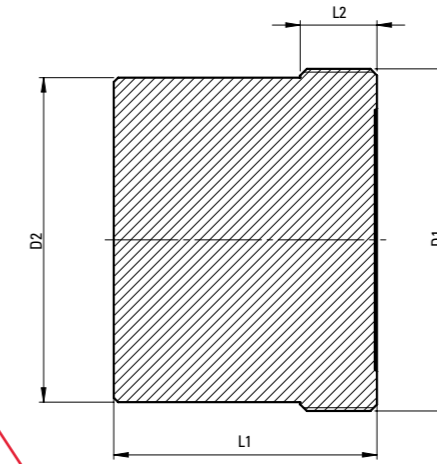
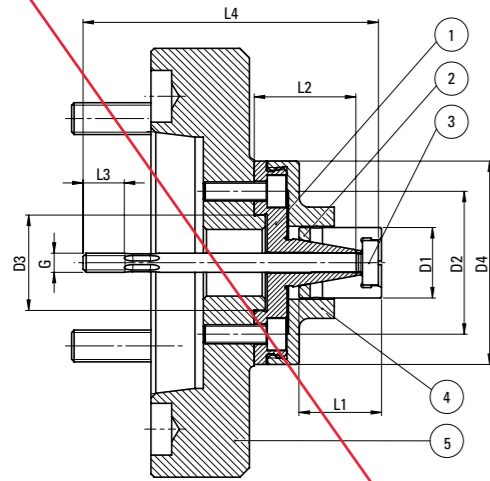
- Short set-up time due to sleeve with quick-change fastener
- High runout ≤ 0,01 mm
- Clamping tolerance nominal diameter ± 0,5 mm
- Compact design therefore reduced interfering edges
- Optional with integrated air sensing

工件夹持
Workpiece Clamping

自动拉刀系统
Automatic Tool Clamping

刀具夹持
Tool Clamping

工件自动化
Workpiece Automation



内涨芯轴 45 / 100

Cone Expanding Mandrel KSD 45 / 100

类型 type	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	G	DIN 912
KSD 45	18-25	45	30	64	26	32	13	93	M6	M6 (4x90°)
	25-35	45	30	64	30	36	26	83,5	M10	M6 (4x90°)
	35-45	45	30	64	40	46	26	93	M10	M6 (4x90°)
KSD 100	45-55	75	60	95	40	45	27	107,5	M12	M6 (4x90°)
	55-65	75	60	95	40	45	27	107,5	M12	M6 (4x90°)
	65-80	75	60	95	40	46	27	107,5	M12	M6 (4x90°)
	80-100	75	60	95	56	56	27	117,5	M12	M6 (4x90°)
	100-125	75	95	95	63	65	27	128	M12	M6 (4x90°)

内涨芯轴KSD特别适合夹持长度较短的，内径夹持到 $\Phi 100\text{mm}$ ，同时具有特别好的旋转跳动特点。这些零件很方便的组合起来不但垂直而且水平安装在不同的机床主轴上，带弹性的涨套两边被切槽而且使圆柱式夹持成为可能。止动块是按可以自车的形式做好的，客户可以根据自己的需要自车。

非标芯轴欢迎垂询。

The cone expanding mandrels KSD are particularly suitable for internal clamping of short workpieces up to a clamping diameter 100 mm and this with outstanding runout characteristics. The components can be easily combined and the system can be mounted horizontal as well as vertical on usual motor spindles. The sleeves with forced pull-off are double-sided slitted and allow a faultlessly cylindrical clamping. The length endstops are delivered in soft rough-turned version in order to enable you to modify them to the suitable length.

Special cone expanding mandrels on request!

零件

Components

类型 type	大小 size [mm]	位置1 锥面 cone	位置2 涨套 sleeve	位置3 拉栓 draw-bolt	位置4 止动块 end-stop	位置5 法兰(大小) flange (size)	
KSD 45	18-25	OZ 1631/1	OZ 1630/102	OZ 1947/101	OZ 1632/1	BSK 2237/7	KK4
	25-35	OZ 1631/2	OZ 1630/202	OZ 1947/201	OZ 1632/2	BSK 2319/1	KK5
	35-45	OZ 1631/3	OZ 1630/302	OZ 1947/301	OZ 1632/3	BSK 2241/1	KK6
KSD 100	45-55	OZ 1634/1	OZ 1633/102	OZ 1948/101	OZ 1635/1	BSK 2237/8	KK4
	55-65	OZ 1634/2	OZ 1633/202	OZ 1948/201	OZ 1635/2	BSK 2315/2	KK5
	65-80	OZ 1634/3	OZ 1633/302	OZ 1948/301	OZ 1635/3	BSK 2241/2	KK6
	80-100	OZ 1634/4	OZ 1633/402	OZ 1948/401	OZ 1635/4	BSK 1781/5	KK8
	100-125	OZ 1634/5	OZ 1633/502	OZ 1948/501	OZ 1635/5		

这里可以根据您的要求配置您的芯轴。

Please configurate your expanding mandrel according to your application.

连接器-毛坯

Adapter Blanks

SPANNAX®

大小 size	订货号 item no.	D1	D2 [mm]	L1 [mm]	L2 [mm]
42	036.427/01	M50x1,5	46	60	17,5
	036.427/02	M52x1,5	48	60	17,5
	036.427/03	M54x1,5	50	60	22,0
	036.427/04	M58x1,5	52	60	17,5
	036.427/05	M60x1,5	56	60	17,5
	036.427/06	M66x1,5	62	60	17,5
	036.427/07	M74x1,5	70	60	22,0
65	036.427/08	M78x1,5	74	60	17,5
	036.427/09	M85x2,0	80	60	17,5
100	036.427/10	M95x2,0	90	60	25,0
	036.427/11	M115x2,0	100	60	25,0

QUADRO®

大小 size	订货号 item no.	D1	D2 [mm]	L1 [mm]	L2 [mm]
KSFB 26/ KSFB 30	036.403/0	M50x1,5	46	60	8,0
KSFB 40	036.396/0	M66x1,5	62	60	8,0
KSFB 60	036.397/0	M90x1,5	85	60	8,0
KSFB 80	036.398/0	M114x2,0	100	60	11,0

这个连接器毛坯是为卡盘准备的，这样您就可以适配于您的机床主轴。

那么请您就此依照您卡盘 (SPANNAX®/QUADRO) 的连接螺纹 (D1) 选择合适的毛坯。

我们也很愿意为您制造机床适合的连接器，请使用我们的安装尺寸表 (25页) 或者请发给我们您的机床主轴图。

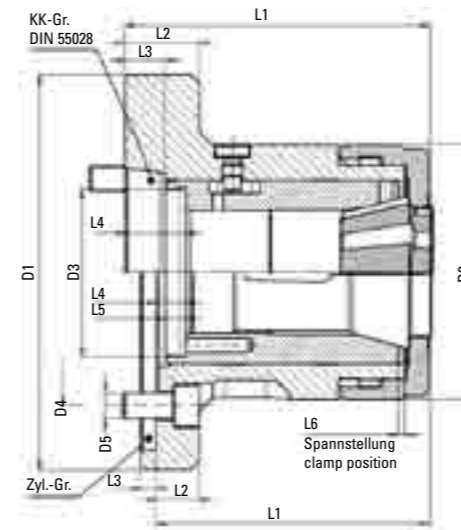
These adapter blanks are pre-machined according to the chuck type. So you can machine them according to your machine-spindle.

Please choose the appropriate adapter blank according to the connection thread [D1] of your chuck (SPANNAX®/QUADRO®).

With pleasure we will produce for you your machine-specific adapter. Please use the form "Installation Dimensions" (page 25) or send us the spindle drawing of your machine.



QUADRO® 夹紧式夹持卡盘 QUADRO® Dead Length Collet Chucks



QUADRO® 压紧式卡盘对于数控车床

QUADRO® 压紧式夹持卡盘主要的应用领域是数控机床，车床，专机等等，它的夹持力是经过液压站的推管推动压套传递的。

高标准的质量和普遍的应用领域，就此QUADRO® 压紧式卡盘成为市场上顶级的产品。

您的效益：

- 由于夹持是压紧状态，工件没有轴向的移动。
- Rubber-Flex RFC夹钳和DIN6343的夹钳都可以在上面使用。
- 很短的换夹时间通过插旋式设计
- 可以通过Rubber-flexRFC夹钳更换成为零震动的双夹持系统

为了解决特殊的夹持任务我们可以适配我们的压紧式卡盘达到你们的使用目的。

当然我们也为您的机床制造连接装置，就此请发给我们您的机床的主轴图和请使用25页的表格。

您也能自己生产连接器，合适的毛坯料请见21页。

QUADRO® Dead Length Collet Chucks for CNC-Lathes

The main range of application of the QUADRO® dead length collet chucks are NC/CNC-machines, lathes, special machines etc. The clamping pressure is hydraulically transferred by a pressure tube on the pressure sleeve. The high quality standard and the universal range of application are the reasons that QUADRO® dead length collets are counting to the first class products in the clamping technology.

Your benefit:

- No axial movement of workpieces due to clamping by pressure
- It is possible to use Rubber-Flex® RFC collets as well as steel collets according to DIN 6343
- Short changeover time for collet change due to bayonet cap
- It is possible to change to vibration-free twin-clamping system with Rubber-Flex® RFC collets

On request we are modifying the dead length collet chucks according to your special clamping application.

Of course we are pleased to produce the adapter for your machine. Just fax us the spindle dimensions or fill out the form on page 25.

You can manufacture the appropriate adapter also by yourself. You will find corresponding adapter blanks on page 21.

QUADRO® 夹紧式夹持卡盘

类型 type	订货号 item no.	尺寸 size	短锥 大小 Zyl.-Gr.	Rubber- Flex® 号./no.	夹钳号 collet no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	D5 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	L6 [mm]	最大转速 rpm* rpm* max. [min ⁻¹]
KSFB 26/4	036.000.2.157	26	A2-4	RFC 20	161 E	112	85	M50 x 1,5	82,6	3 x M10	107,9	30	13	26,5	8	2	6000
KSFB 26/100	036.000.2.171	26	Z100	RFC 20	161 E	112	85	M50 x 1,5	82,6	3 x M10	97,5	24	6	16	8	2	6000
KSFB 30/4	036.000.2.159	30	A2-4	RFC 24	163 E	112	85	M50 x 1,5	82,6	3 x M10	107,9	30	13	26,5	8	2	6000
KSFB 30/100	036.000.2.173	30	Z100	RFC 24	163 E	112	85	M50 x 1,5	82,6	3 x M10	97,5	24	6	16	8	2	6000
KSFB 40/5	036.000.2.161	40	A2-5	RFC 36	173 E	135	100	M66 x 1,5	104,8	4 x M10	123,5	27	16,5	28	8	2,5	6000
KSFB 40/6	036.000.2.163	40	A2-6	RFC 36	173 E	170	100	M66 x 1,5	133,4	4 x M12	123,5	34,4	17,5	28	8	2,5	6000
KSFB 40/88	036.000.2.185	40	Z88	RFC 36	173 E	132	100	M66 x 1,5	115	6 x M8	113,5	17	4	14	8	2,5	6000
KSFB 40/140	036.000.2.175	40	Z140	RFC 36	173 E	155	100	M66 x 1,5	104,8	3 x M10	107,5	17	6	12	8	2,5	6000
KSFB 60/6	036.000.2.165	60	A2-6	RFC 52	185 E	170	130	M90 x 1,5	133,4	4 x M12	145	27	17,5	30,5	8	2,5	5000
KSFB 60/8	036.000.2.167	60	A2-8	RFC 52	185 E	220	130	M90 x 1,5	171,4	4 x M16	146	39	20	31,5	8	2,5	5000
KSFB 60/115	036.000.2.186	60	Z115	RFC 52	185 E	154	130	M90 x 1,5	136	8 x M8	131,5	11	4	13	8	2,5	5000
KSFB 60/170	036.000.2.177	60	Z170	RFC 52	185 E	185	130	M90 x 1,5	133,4	6 x M12	133	24	6	18,5	8	2,5	5000
KSFB 60/220	036.000.2.178	60	Z220	RFC 52	185 E	235	130	M90 x 1,5	171,4	6 x M16	135	26	6	20,5	8	2,5	5000
KSFB 80/8	036.000.2.169	80	A2-8	RFC 52	193 E	220	155	M114 x 2	171,4	6 x M16	176,4	35	19	41	11	6,5	4000

动平衡
凸轮锁扣和进一步的卡盘类型欢迎垂询。

* unbalanced
Camlock and other types on request.

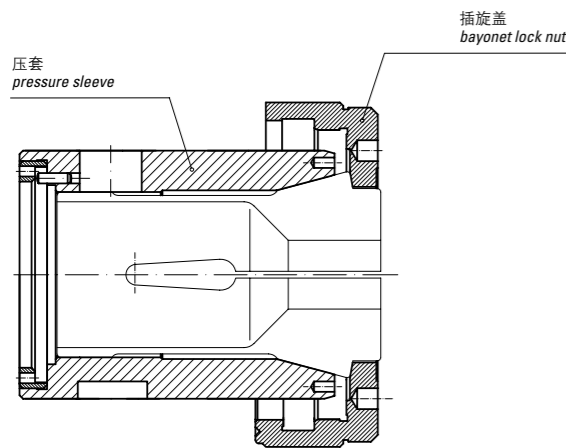
Rubber-Flex® RFC 或者DIN6343夹紧式夹钳可以被使用。

As Standard we use Rubber-Flex® RFC or dead length collets according to DIN 6343



S. 28

S. 30



标准卡盘（压套和插旋盖）归类部件

Reduction Parts for Standard Chucks

这些归类部件使更小的Rubber-Flex® RFC或者DIN6343压紧式夹钳在相同的卡盘本体里安装为可能，就此您需要压套和插旋盖)

The reduction parts allow the use of smaller Rubber-Flex® RFC or steel collets DIN 6343 in the same main body of the chuck. For that modification you need pressure sleeve and bayonet lock nut.

标准卡盘 for standard chuck	归类/ reduction to		压套 / pressure sleeve 订货号 / item no.	插旋盖 / bayonet lock nut 订货号 / item no.
	夹钳 / collet	Rubber Flex® RFC		
KSFB 30	161 E	RFC 20	036.097/0	036.110/2
KSFB 40	161 E	RFC 20	036.027/1	036.179/2
	163 E	RFC 24	036.027/0	036.214/0
KSFB 60	173 E	RFC 36	036.067/01	036.136/0
	177 E	RFC 36	036.376/1	036.304/2
KSFB 80	173 E	RFC 36	036.068/2	036.208/2
	185 F	RFC 52	036.127/1	036.208/1

对于双夹持的安装附件

两个前后放置的 Rubber-Flex® RFC36或者RFC52能保证最大程度的零震动的棒料夹持，这个夹持长度是90或者110mm，这种夹持形式随着增长的棒料直径而被推荐。

Accessories: Twin-Chucking Facility

Two Rubber-Flex® RFC 36 or RFC 52 positioned behind each other guarantee maximum vibration-free chucking of bar material. Chucking length is 90 respective 110 mm! This type is recommended for larger bar diameters.

适于 fits to	产品号 item no.
KSFB 40 / RFC 36	036.014/0
KSFB 60 / RFC 52	036.015/0

止动块对于Rubber-Flex® 夹钳

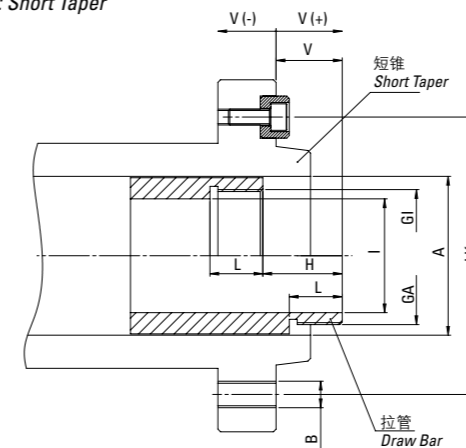
End-stop for Rubber-Flex® Collets*

passend zu fits to	Art. Nr. item no.
RFC 36	036.016/0
RFC 52	036.017/0

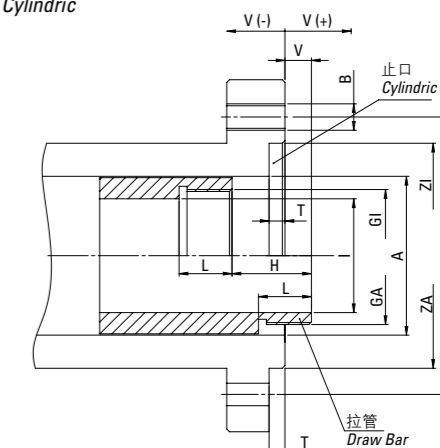
*仅能在带横孔的推套里安装。

* Can only be used in pressure sleeves with cross-holes.

类型 1: 短锥
Style 1: Short Taper



类型 1: 止口
Style 2: Cylindric



安装尺寸对于后拉式/前推管连接器

Installation Dimensions for Push/Draw-Back Tube

请在以下表格中填写后拉式/前推管和主轴的连接尺寸。

Please check the dimensions of machinespindle and fill it in following form.

安装尺寸 / Installation Dimensions	
机床名称 for machine tool	
类型1或者类型2 Style 1 or 2	
短锥大小(类型1) Short Taper Size (Style 1)	
圆柱型连接(类型2) Cylindric (Style 2)	
A	
B	
GA	
GI	
H	
I	
L	
LK	
T	
V	
ZA	
ZI	

V请填写正负号!
B请给出螺纹孔数量!

Please indicate dimension V as positiv or negativ!
Please indicate B with amount of holes!

请订单时发给我们或传真给我们
+49 (0) 70 21 / 94 69 - 51

Please fax it at the order
+49 70 21 / 94 69 - 51

QUADRO® 快速夹持卡盘 SSF QUADRO® Lever-Operated Collet Chuck SSF

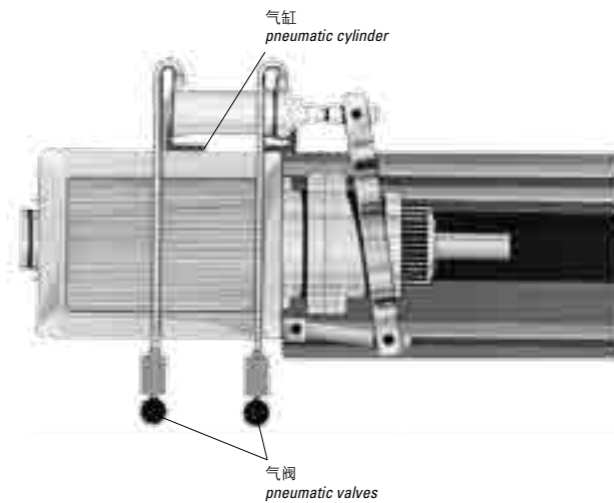


QUADRO® 快速夹持卡盘 SSF

- 快速夹持系统已经适配于压紧式夹钳DIN6343或者Rubber-Flex® 夹钳
- 夹持是通过这个手摇杆操纵的，夹持力是通过自锁球珠的作用传递到压套上的。
- 在使用Rubber-flex® RFC夹钳时直径公差直到0.7可以被平衡而不需要调搭扣栓
- 合适的设计也适应更高的转速
- 用于手柄的放置的叉头欢迎垂询

QUADRO® Lever-Operated Collet Chuck SSF

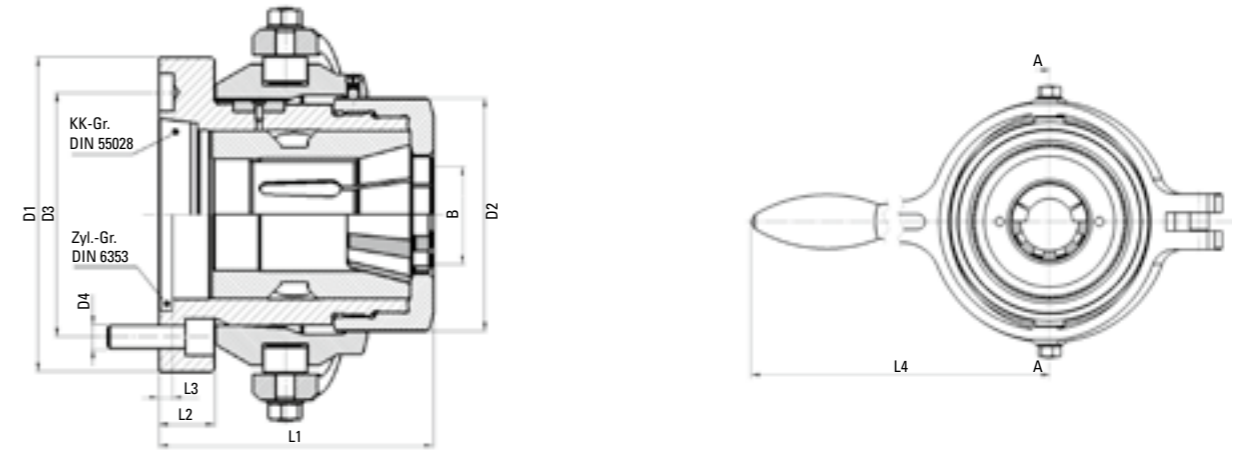
- Quick clamping unit ready for mounting, suitable for DIN 6343 steel or Rubber-Flex® collets
- The chuck is closed manually with a lever. Closing force is transmitted self locking to the collet sleeve by means of balls
- At the use of Rubber-Flex® RFC collets the chuck compensates diameter tolerances up to 0,7 mm of workpieces without adjusting the cap
- Simple design suitable for increased spindle speed
- Forkhead for lever storage on request



快速夹持卡盘可以通过气动缸而自动化，请垂询我们的安装文件。

The lever operated collet chucks can be automatised by use of pneumatic cylinders.
Please ask for our installation instructions.

QUADRO® 快速夹持卡盘 SSF QUADRO® Lever-Operated Collet Chuck SSF



QUADRO® 快速夹持卡盘 SSF

类型 type no.	范围 range (B)	KK大小 Zyl. Gr.	Rubber-Flex® 号/no.	夹钳号 collet no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 ** [mm]	最大转速 / rpm * max. [min ⁻¹]
SSF 16 Z	1-16	Z 42	RFC 12	140 E	69	52	57	4 x M5	69,5	9	4	270	5000
SSF 20 Z	2-24	Z 54	RFC 18	148 E	88	66	74	6 x M6	90	11	4	336	5000
SSF 30/5	2-30	A2-5	RFC 24	163 E	135	82	104,8	4 x M10	115,2	25	-	406	4000
SSF 30 Z	2-30	Z 72	RFC 24	163 E	105	82	90	6 x M6	103	12	4	406	4000
SSF 40/5	3-42	A2-5	RFC 36	173 E	135	100	104,8	4 x M10	119	24	-	477	4000
SSF 40/6	3-42	A2-6	RFC 36	173 E	170	100	133,4	4 x M12	122	27	-	477	4000
SSF 40 Z	3-42	Z 88	RFC 36	173 E	122	100	107	8 x M6	107	12	4	477	4000
SSF 60/6	4-60	A2-6	RFC 52	185 E	170	120	133,4	4 x M12	140,2	27	-	550	3000
SSF 60/8	4-60	A2-8	RFC 52	185 E	220	120	171,4	4 x M16	143	30	-	550	3000
SSF 60 Z	4-60	Z 115	RFC 52	185 E	150	120	131	8 x M8	127	14	4	550	3000
SSF 80 Z	20-80	Z 130	-	193 E	178	149	158	8 x M8	151	15	5	577	2500

* 动平衡，更高的转速欢迎垂询！
** 更短的手柄欢迎垂询

* unbalanced. Higher rpm on request!
** shorter lever on request

标准卡盘SSF归类部件

标准卡盘 for standard chuck	归类 / reduction to		压套 / pressure sleeve 订货号 / item no.	搭扣栓 / lock nut 订货号 / item no.
	夹钳 / collet	Rubber Flex RFC		
SSF 40	161 E	RFC 20	BSK 1476S6/3	BSK 1476S20/4
	163 E	RFC 24	BSK 1476S9/3	BSK 1476S5/4
	173 E	RFC 36	BSK 1476/3	BSK 1476/4
SSF 60	171 E	-	BSK 1477S4/3	BSK 1477S6/4
	173 E	RFC 36	BSK 1477/3	BSK 1477/6
	185 E	RFC 52	BSK 1477/3	BSK 1477/4
SSF 80	173 E	RFC 36	BSK 735/13	BSK 735/14
	185 E	RFC 52	BSK 735/15	BSK 735/16
	193 E	-	BSK 735/3	BSK 735/4

归类部件使更小的压紧式夹钳和Rubber-flex® RFC可以在相同的卡盘本体里安装，就此您只需要压套和搭扣栓。

Reduction parts allow the use of smaller Rubber-Flex® RFC or dead length steel collets in the same base body of the chuck. Corresponding pressure sleeve and lock nut are needed for modification.



S. 28

S. 30

工件夹持
Workpiece Clamping

自动拉刀系统
Automatic Tool Clamping

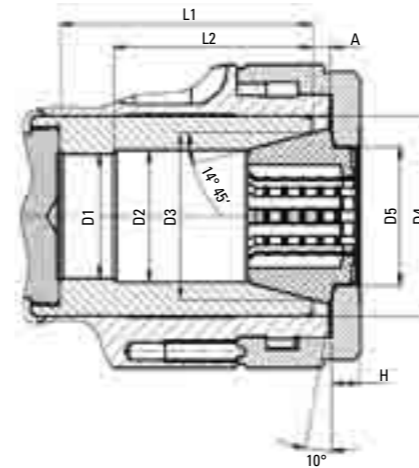
刀具夹持
Tool Clamping

工件自动化
Workpiece Automation

5 in 1



DIN 6343



Rubber-Flex® RFC 夹钳

您将从很大Rubber-flex® RFC夹钳的夹持范围中得益，有弹性的橡胶金属连接使夹持范围±1mm. 这样不仅节省四个附加的夹钳而且明显减少您的安装时间。

半成品或者敏感的工作件将在Rubber-flexRFC夹钳里用平滑的孔精确夹持。

Rubber-Flex® 带齿的夹钳

Rubber-Flex夹钳RFC36 (173E) 和RFC52 (185E) 都可以用在Full-Grip，有一定宽度的钢瓣可以达到较高的刚性，另外类似铺路路面的齿面明显提高了夹紧力，Full-Grip特别适合加工棒料有着较大的夹持公差和大的加工力度。

您的效益:

- 1个Rubber-flex代替5个夹钳
- 夹持范围= 夹持直径±1mm
- 减少更换时间
- 能传递更大的旋转力矩
- 外表面的保护通过钢瓣的平行移动(RFC)
- 抗冷却液和温度100摄氏度以下
- 对于冷却液和切屑完全密封

Rubber-Flex® RFC Collet

Benefit from the large clamping range of the Rubber-Flex® RFC collets. The elastic rubber-metal conjunction allows a clamping range of ± 1 mm to the nominal diameter. So you save not only the investment in four additional steel collets but you are also reducing your changeover times.

Pre-processed or sensitive workpieces are precisely clamped in Rubber-Flex® RFC collets with smooth bore.

Rubber-Flex® Full Grip – „the collet with teeth“

The Rubber-Flex® collets type RFC 36 (173E) and RFC 52 (185E) are also available in "Full-Grip" design. Wider steel segments provide a higher rigidity. Furthermore these double-serrated collets have an increased clamping force and are especially designed to machine bar material with wide clamping tolerances and high torque.

Your benefit:

- 1 Rubber-Flex® is replacing 5 steel collets
- Clamping range = nominal diameter ± 1 mm
- Reduction of changeover time
- Higher torques can be transferred
- Surface gentle clamping by parallel closing of steel segments (RFC)
- Coolant and temperature resistant up to 100 °C
- Perfect sealing against coolant and swarf

Rubber-Flex® RFC 平滑孔 / smooth bore

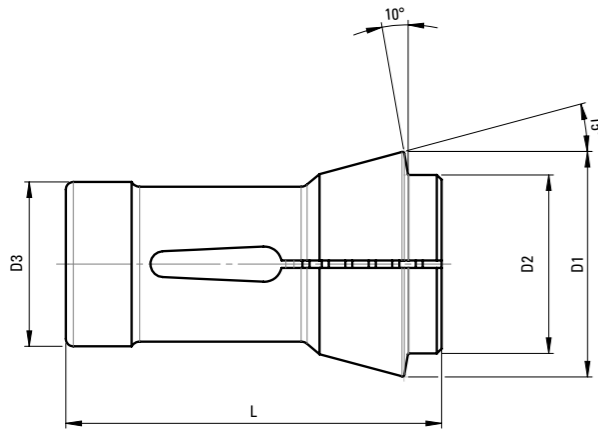
系列/ Series	755 E / RFC 12		760 E / RFC 18		765 E / RFC 20		770 E / RFC 24		775 E / RFC 36		780 E / RFC 52		
DIN 6343	140 E		148 E		161 E		163 E		173 E		185 E		
范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...	范围 range [mm]	订货号 item no. RFC...
3 - 4	1204	3 - 5	1804	4 - 6	2006	6 - 8	2408	7 - 9	3608	19 - 21*	5220		
4 - 5	1205	4 - 6	1806	6 - 8	2008	8 - 10	2410	9 - 11	3610	21 - 23*	5222		
5 - 6	1206	6 - 8	1808	8 - 10	2010	10 - 12	2412	11 - 13*	3612	23 - 25*	5224		
6 - 7	1207	8 - 10	1810	10 - 12	2012	12 - 14	2414	13 - 15*	3614	25 - 27*	5226		
7 - 8	1208	10 - 12	1812	12 - 14	2014	14 - 16	2416	15 - 17*	3616	27 - 29*	5228		
8 - 9	1209	12 - 14	1814	14 - 16	2016	16 - 18	2418	16 - 18	3618	29 - 31*	5230		
9 - 10	1210	14 - 16	1816	16 - 18	2018	18 - 20	2420	18 - 20	3620	31 - 33*	5232		
10 - 11	1211	16 - 18	1818	18 - 20	2020	20 - 22	2422	20 - 22	3622	33 - 35*	5234		
11 - 12	1212	18 - 20	1820	20 - 22	2022	22 - 24	2424	22 - 24	3624	35 - 37*	5236		
12 - 13	1213			22 - 24	2024	24 - 26	2426	24 - 26	3626	37 - 39*	5238		
13 - 14	1214			24 - 26	2026	26 - 28	2428	26 - 28	3628	39 - 41*	5240		
14 - 15	1215					28 - 30	2430	28 - 30	3630	41 - 43*	5242		
15 - 16	1216							31 - 33*	3632	43 - 45*	5244		
								33 - 35*	3634	45 - 47*	5246		
								35 - 37*	3636	47 - 49*	5248		
								37 - 39*	3638	49 - 51*	5250		
								39 - 41*	3640	51 - 53*	5252		
								41 - 43*	3642	53 - 55*	5254		
										55 - 57*	5256		
										57 - 59*	5258		
										59 - 61*	5260		
										61 - 63	5262		
										63 - 65	5264		

max.-Ø	18	24	28	32	45	65
D1 H7	22	28	32	35	48	66
D2	22,4	28,4	34	36	49	68
D3 +0,1	29	37	44	47	59	83
D4 min.	35	46	52	56	72	94
D5	22	29	36	39	51	74
L1	49	63	71	72	83,5	102
L2	38	48	50	57	50	66
H	6	8	8	8	8,1	9,6
最大夹持冲程 "A" max. clamping stroke "A"	4,5	6,5	6,5	6,5	6,5	6,5

* Full Grip 类型是可以订货的。在订Rubber-Flex® Full Grip货的时候请给出 RFC.../R, 例如 35-37 RFC3636/R

* available in Full-Grip version! for Rubber-Flex® Full Grip please complete RFC.../R. For example 35 - 37 » RFC 3636/R

DIN 6343



标准压紧式夹钳对于 QUADRO® 工件夹持

Standard Dead Length Steel Collets for QUADRO® Chucks

订货号 item no.	夹持范围 clamping range	形状 shape	D1 [mm]	D2 [mm]	D3 [mm]	L1 [mm]	递增 increments
0140.....	2-16	○	30	21	22	55	0,5
0140-V.....	4-10	◇	30	21	22	55	1,0
0140-S.....	4-14	⬡	30	21	22	55	1,0
0148.....	2-24	○	38	28	28	70	0,5
0148-V.....	4-14, 16	◇	38	28	28	70	1,0
0148-S.....	4-17	⬡	38	28	28	70	1,0
0161.....	2-26	○	45	34	32	75	0,5
0161-V.....	5-14, 16, 18	◇	45	34	32	75	1,0
0161-S.....	4-17, 19, 22	⬡	45	34	32	75	1,0
0163.....	2-30	○	48	38	35	80	0,5
0163-V.....	5-14, 16, 18, 20	◇	48	38	35	80	1,0
0163-S.....	4-17, 19, 22, 24, 27	⬡	48	38	35	80	1,0
0173.....	1-42	○	60	50	48	94	0,5
0173-V.....	6-14, 16, 18, 20, 22, 25, 28, 30	◇	60	50	48	94	1,0
0173-S.....	6-17, 19, 22, 24, 27, 30, 32, 36	⬡	60	50	48	94	1,0
0185.....	4-60	○	84	73	66	110	1,0
0185-V.....	7-14, 16, 18, 20, 22, 25, 28, 30, 32, 36, 40	◇	84	73	66	110	1,0
0185-S.....	8-17, 19, 22, 24, 27, 30, 32, 36, 38, 41, 46, 50	⬡	84	73	66	110	1,0
0193.....	20-80	○	107	92	90	130	1,0

预定例如 夹钳161 E, Ø 6 mm: 0161-06
另外的夹持孔欢迎垂询。

ordering example for collet 161 E, Ø 6 mm: 0161-06
Other clamping diameter on request.

Vario 止动块-这个普遍的定位系统对于压钳

通过这个专利的Vario定位系统在压钳里可以快速的，方便的安装可调的止动块，就此止动块用3个螺丝在压钳里固定，不需要夹紧夹钳。止动块可以用六方起子调整和锁紧，这种系统是用高强度特殊钢生产的，一部分镍和带有防氧化的保护。交货时带有整套木盒带有以下型号夹钳(DIN6343): 161E,162E, 163E,164E,173E,185E,圆形，四边，六方。

您的效益:

- 少的换夹时间因为安装简便
- 减少废品率因为精密的定位锁紧系统，从而达到要求的定位程度。

Vario EndStop – The universal endstop system for dead length steel collets

Usual dead length steel collets can be equipped fast and easy with an adjustable endstop by means of the patented Vario EndStop system. For that purpose the endstop is fixed in the collet with 3 screws without twisting the collet. Then the endstop is adjusted and fixed with a hex-wrench and a clever locking technology. The mechanically strained parts are produced from high-strength special steel, partially nitrated and coated with a long-lasting oxidation protection. The universal set is delivered in a practical wooden box for the following collet sizes (DIN 6343): 161E, 162E, 163E, 164E, 173E, 185E in round, square, hexagonal bore.

Your benefit:

- Short changeover time due to easy assembly
- Reduced amount of defective goods due to precise adjustment- and locking-technology which is granting the desired end-stop settings

尺寸 size	订货号 item no.	加长定位 endstop extension	夹持直径 clamping diameter [mm]	夹持 clamping length [mm]
161-E	036.5010	带 / with	< 6	~ 125
		带 / with	6-8	~ 65
		不带 / without	8-26	~ 40
162-E / 163-E*	036.5020	带 / with	< 6	~ 120
		带 / with	6-8	~ 60
		不带 / without	8-30	~ 35
164-E	036.5030	带 / with	< 6	~ 150
		带 / with	6-8	~ 100
		不带 / without	8-32	~ 60
173-E	036.5040	带 / with	< 8	~ 135
		带 / with	8-10	~ 85
		不带 / without	10-42	~ 60
185-E	036.5050	带 / with	< 14	~ 165
		带 / with	14-18	~ 90
		不带 / without	18-60	~ 65

* 在163-E表达的夹持长度 +10 mm

* named clamping length + 10 mm at 163-E



自动弹簧夹爪 TGSP

Ortlieb 经典的弹簧夹爪始终是根据您的应用的情况调整的。

夹持用弹性力!

您的效益:

- 通过管材的应用达到高的可靠性。弹簧盘有着高抗折度和稳定性
- 通过独一无二的性价比达到经济的技术解决方案
- 灵活由于普通的液动或者气动缸的安装

Automatic Tool Clamping System TGSP

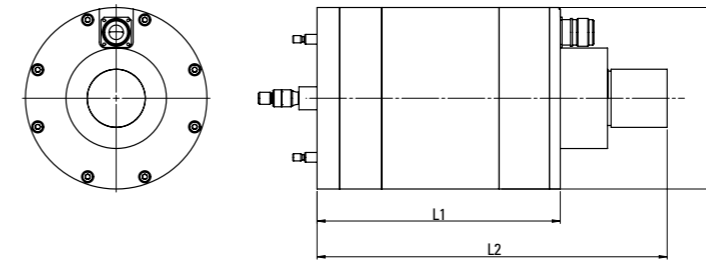
The classic Ortlieb tool clamping system for your special spindle design.

Spring loaded tool clamping!

Your benefit:

- Highest reliability by usage of Röhrs coil springs with high break resistance and high endurance strength
- Economical technical solution with unique price-performance ratio
- Flexible solution as mounting of standard hydraulic and pneumatic cylinders is possible

HSK 锥DIN 69893-标准尺寸 HSK taper DIN 69893 - Nominal size Form A + E	锥度-标准尺寸 Ø Nominal taper Ø Form B + F	订货号 item no.	最大 Fz. [kN]	最大 Fsp. [kN]	DIN ISO Fsp [kN]
32	40	TGSP 24-XX	2	6	5
40	50	TGSP 30-XX	4	12	6,8
50	63	TGSP 38-XX	8	24	11
63	80	TGSP 48-XX	10	30	18
100	125	TGSP 75-XX	20	60	45



带惯性滑行的单向电动动力缸 EML

电动动力缸释放装置EML可以释放自动夹持系统和代替与之相对应的的液压力缸在机床领域里面。通过使用基于空间飞行器的线性传动系统得到一个独一无二的高的力密度，而且在一个紧凑的建造尺寸里。我们很乐意为您的主轴设计电动松开单元。

您的效益:

- 维护很少，因为没有漏出物
- 经济，因为很少的能量消耗与液压缸相比。
- 环境保护，因为很少的噪音。
- 更有效率，因为更短的工具更换时间

HSK 锥DIN 69893-标准尺寸 HSK taper DIN 69893 - Nominal size Form A + E	锥度-标准尺寸 Ø Nominal taper Ø Form B + F	订货号 item no.	最大 Fz. [kN]	速度 speed [mm/s]	主轴斜度 spindle pitch [mm]	最大冲程 max. stroke [mm]	D1 [mm]	L1 [mm]	L2 [mm]
63	80	EML 48-01	16	75	1,8	11,5	150	200	290

进一步大小欢迎询问!

other sizes on request!

The Electromechanical One-Way Power Cylinder EML with Freewheeling

The electromechanical release unit EML releases automatic clamping systems and it can therefore replace corresponding hydraulic cylinders in tool machines. This linear drive system is based on aerospace drive technology and it combines a high power density with compact dimensions. We modify with pleasure the one-way-power cylinder according to your application. Contact us!

Your benefit:

- Maintenance-friendly e.g. no leakage
- Cost saving due to reduced energy consumption in relation to hydraulic
- Environment-friendly due to reduced noise emission
- Increases efficiency due to shorter tool changing cycles



自动无弹簧的刀具夹持系统KVSL对于磨削主轴

这种新发展的刀具夹持系统是没有弹簧的，气动双向的动力缸SLE通过可以自由调整的拉杆传递后拉力到机械式加力装置KV的活塞上，这个活塞直接作用到夹爪上和自动卡到刀具达到夹持。

刀具的释放是通过被双向的动力缸产生的反方向的力达到的。自动刀具夹持系统KVSL只能用ORTLIEB TG夹爪。

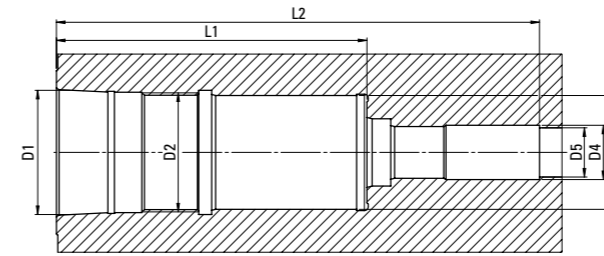
我们很乐意为您设计自动无弹簧的刀具夹持系统

The Automatic Springless Tool Clamping System KVSL for Grinding Spindles

This new developed tool clamping system is functioning without springs. The pneumatic two-way power cylinder SLE transfers the pull force via a freewheel pull-bar directly to the piston of the mechanical intensifier KV. The piston acts directly on the tool gripper and locks self-impeding the tool in clamping position. The releasing of the tool is carried out by a reverse force created by the two-way power cylinder SLE.

The automatic tool clamping system KVSL can only be operated with Ortlieb TG tool grippers.

*We design with pleasure your automatic springless tool clamping system!!
Please contact us!*



机械的加力装置和带持续夹持功能的插销系统KV。

这个新发展的加力装置转变后拉力1:3的比例为夹持力，这是通过楔锁系统达到的。当夹持的时候这个系统自行锁住，一个控制的冲力足够可以释放系统和克服自锁。

您的效益：

- 因为紧凑的建造尺寸很简单的融入
- 安全的夹持通高的力转换 (1:9)
- 持续的夹持力通过自锁和保险弹簧的持续夹持

The Mechanical Intensifying and Locking Unit KV with Post-Clamping Effect

This new developed intensifier converts the pull-force with factor 1:9 in clamping force via a key-system. The system locks self-impeding when clamping. A controlled force impulse is sufficient in order to overcome the self-impeding and to release the system.

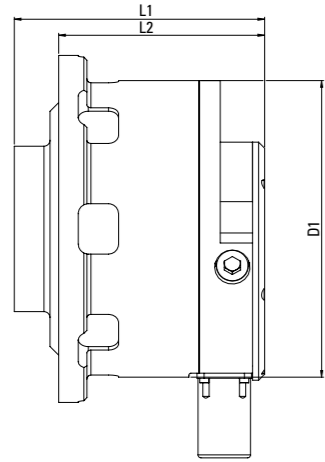
Your benefit:

- Simple to integrate by means of compact dimensions
- Safe clamping by means of high power gear ratio of 1:9 at HSK
- Constant clamping force via self-impeding and post-clamping effect of the safety spring

尺寸 size	订货号 item no.	D1 [mm]	D2 [mm]	D3 ^{H5} [mm]	D4 ^{H7} [mm]	D5 [mm]	L1 ^{+0.01} [mm]	L2 [mm]
HSK 50	KV38-14	38	M36x1,5	34	16	14	95,8	140,8
HSK 63	KV48-13	48	M46x1,5	44	21	19	120	186,7

进一步的建造大小欢迎垂询!

other sizes on request!



气动动力缸 SLE (夹持和释放)

夹持和释放装置是用惯性拉杆操作的。这样的话，SLE在主轴工作的时候是分开的，这个夹持和释放装置SLE仅仅能和ORTLIEB的KV加力装置一起运行。

The Pneumatic Clamp/Release Unit SLE with Freewheel

The pneumatic clamp/release unit is operating with a freewheel pull-bar. Therefore it is assured that the SLE is uncoupled at the spindle operation. The clamp/release unit SLE can only be operated with Ortlieb intensifier KV.

您的效益:

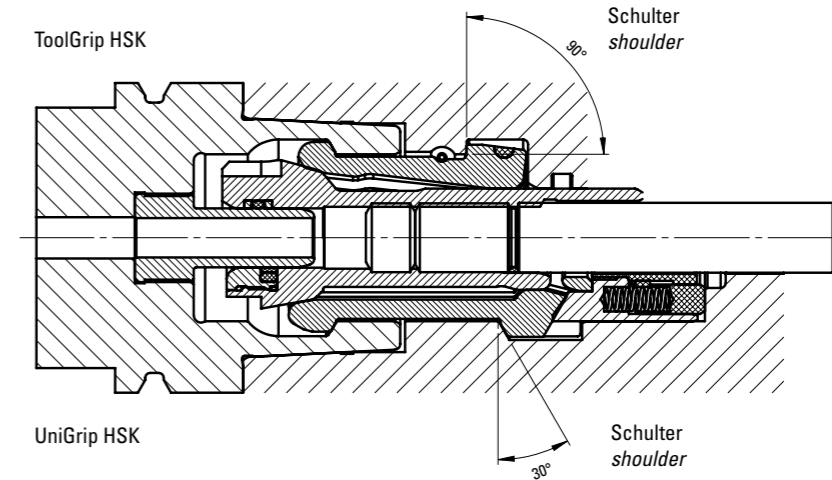
- 很容易融入因为紧凑的建造尺寸
- 安全的夹持和释放通过感应的位置测量系统
- 安装切削液通孔可能
- 不同的安装造型可能。

Your benefit:

- Simple to integrate by means of compact dimensions
- Safe clamping and releasing by means of position control via inductive position measuring system
- It is possible to integrate a coolant rotary feedthrough
- Different installation modifications are possible

尺寸 size	订货号 item no.	D1 [mm]	L1 [mm]	L2 [mm]
HSK 50	SLE38-07	147	124	102
HSK 63	SLE48-03	155	193	183

进一步的建造尺寸欢迎垂询! other sizes on request!



拉刀爪对于空心锥柄 连接单元 DIN 69893/69063 ISO 12164-0/12164-2

Ortlieb HSK 拉刀爪是安全和可靠夹持HSK-刀具的基础，通过陶瓷在作用面的应用，而使表面有着抗磨损的硬质涂层，这样就能提供一个完全不需要维护的拉刀爪，在第一次的润滑过后，一直能保证一个稳定的夹持力，直到三百万的负荷更换的产品使用寿命。

这个可靠的夹持力HSK A50 能高出DIN 69893/ 69063要求的最少夹持力将近200%。这样在高负荷和高转速的情况下能保证安全的刀具夹持。

智能设计的安装工具确保一个最短时间的安装和更换时间。

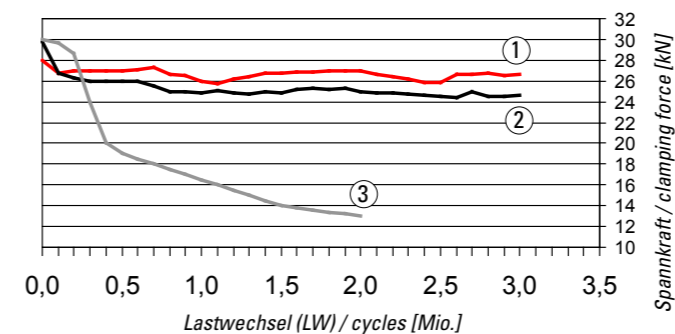
Ortlieb HSK 拉刀爪有两种类别， Tool-Grip HSK 和 Uni-Grip HSK，特别是 Tool-Grip HSK，由于紧凑的构造和大的切削液通路。

The Tool Gripper for Hollow Taper Shank Interface DIN 69893/69063 ISO 12164-0/12164-2

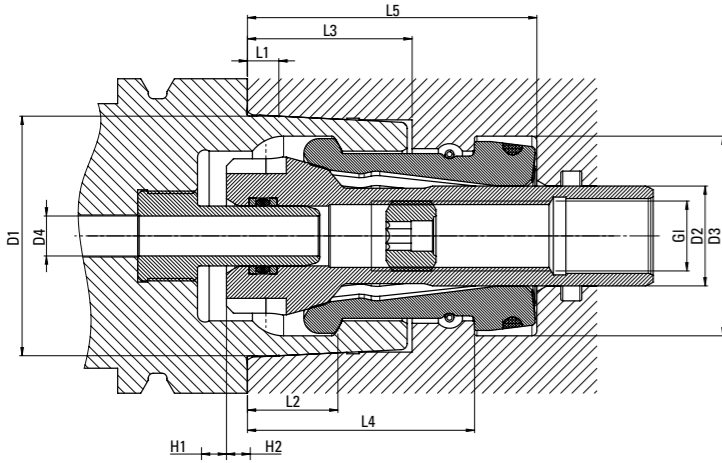
The Ortlieb HSK-tool grippers are the basis for safe and reliable clamping of HSK-tools. For the first time it is possible to offer maintenance-free tool grippers by the use of ceramic on the functional surfaces in connection with a wear-resistant hard coating. After a one-time initial lubrication the tool gripper is clamping up to 3 mio. cycles without losing any clamping force.

The permitted clamping force is up to 200 % (HSK A50) higher than the by the standard DIN 69893/69063 recommended minimum clamping force. This ensures a safe tool clamping also at high load and high rotation speed.

Intelligent designed mounting fixtures are assuring shortest mounting or changing time for the tool grippers. The Ortlieb HSK-tool grippers are available in two product lines: the ToolGrip HSK and UniGrip HSK. Specially the ToolGrip HSK is convincing by compact dimensions, a simple and maintenance-friendly design and a large coolant passage (HSK A63 up to Ø 14 mm).



1. WGC 48-07: 陶瓷环 + Maxit- WCH 类型的涂层, 免维护
ceramic ring + Maxit-WCH mod coating, maintenance-free
2. WGB 48: Maxit- WCH 类型的涂层, 免维护
Maxit-WCH mod coating, maintenance-free
3. WG 48: 普通钢材, 维护根据润滑计划
standard steel design, maintenance acc. lubrication chart



ToolGrip HSK

Tool-Grip HSK拉刀爪特别适合HSC加工和重铣削研发的能达到DIN 69893要求的最低夹持力更高很多的夹持力。这个拉刀爪的特性是结构紧凑，和免维护的特点，大的切削液的通路和高的夹持力。这个硫化橡胶合成的6瓣夹爪是为两百万的负荷更换的产品寿命设计的。

根据需要所有的拉刀爪都可供应带抗磨损的涂层的品。

HSK-尺寸 HSK-size	订货号 item no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	GI	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	H1 [mm]	H2 [mm]	Fz max. [kN]	Fsp. max. [kN]
A25/B32	TG 19-06	19	6,2	17	3	M4x0,5	2,5	7,21	13,5	18	24	4,6	2,5	1,5	4,5
A32/B40	TG 24-06	24	9	20,5	4,2	M6	3,2	8,92	16,5	22,9	29,1	4,7	2,5	2	6
A40/B50	TG 30-06	30	12	25	5	M8	4	11,42	20,5	28,5	36,5	5,7	2,5	4	12
A50/B63	TG 38-06	38	14	32	6,8	M10x1	5	14,13	25,5	35,6	45,5	6	2,5	8	24
A63/B80	TG 48-06	48	20	40	8,4	M14x1,5	6,3	18,13	33	45,5	58	6	2,5	10	30
A80/B100	TG 60-06	60	23	50	10,2	M16x1,5	8	22,85	41	57,1	73	6,9	2,5	15	45
A100/B125	TG 75-06	75	28,5	63	12	M20x1,5	10	28,56	51	71	91	7,6	3,0	24	60
A125/B160	TG 95-06	95	38	80	14	M27x1,5	12,5	36,27	64	89	114	10	3,0	35	105
A160	TG 120-06	120	45	100	16	M30x1,5	16	45,98	81	113	145	10,5	3,5	45	135

带陶瓷的ToolGrip HSK

对于免维护的运行当较高的负荷时我们推荐带陶瓷Tool-Grip HSK拉刀爪，在第一次润滑以后这种拉刀爪可以没有夹持力的损失直到三百万的负载更换，然后夹持钢瓣才有可能需要更换，这个拉栓可以继续使用。

HSK-尺寸 HSK-size	订货号 item no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	GI	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	H1 [mm]	H2 [mm]	Fz max. [kN]	Fsp. max. [kN]
A50/B63	TGC 38-06	38	14	32	6,8	M10x1	5	14,13	25,5	35,6	45,5	6	2,5	8	24
A63/B80	TGC 48-16	48	20	40	8,4	M14x1,5	6,3	18,13	33	45,56	58	6	2,5	10	30
A100/B125	TGC 75-06	75	28,5	63	12	M20x1,5	10	28,56	51	71	91	7,6	3	20	60

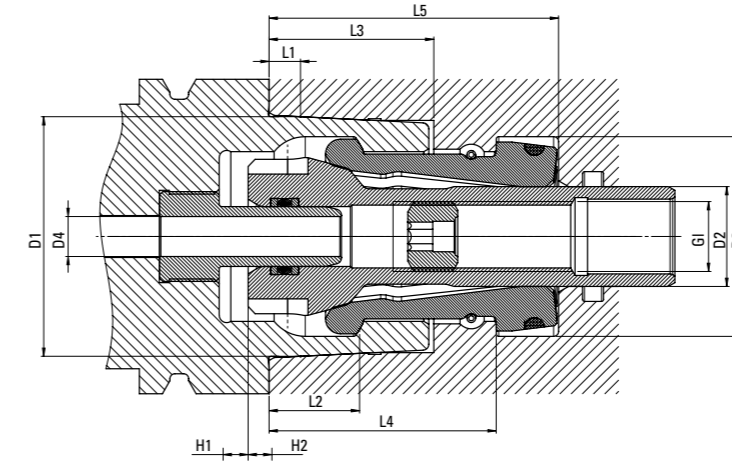
ToolGrip HSK

The ToolGrip HSK tool gripper are specially designed for HSC machining and heavy milling machining. They allow much higher clamping force than the recommended minimum clamping force acc. to standard DIN 69893. These tool grippers convince with their short length, the simple service friendly design, the large coolant passage and the high clamping force. The vulcanised six-piece clamping segments are rated for a life time of 2 mio. load alternations.

On request all tool gripper are available in wear-resistant coated design!

ToolGrip HSK with ceramic

We recommend the ToolGrip HSK tool gripper with ceramic for maintenance-free operation at highest load. After a one-time initial lubrication the tool gripper is clamping up to 3 mio. cycles without losing any clamping force. Then the segments should be changed. The pull stud can continuously be used.



带保持功能的ToolGrip HSK

对于更短循环时间和更快的刀具更换我们设计了特殊的带保持功能的Tool-Grip HSK。这种拉刀爪将在机床主轴里一直勾住刀具，直到被刀具更换器取走。

有不同保持力的拉刀爪欢迎垂询!

ToolGrip HSK with Holding Function

We have designed a special tool gripper with holding function for even shorter cycle time and faster tool change. This tool gripper safely holds the released tool in the spindle till the tool changer is pulling the tool out of the spindle.

Tool gripper with varying holding force on request!

HSK-尺寸 HSK-size	订货号 item no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	GI	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	L5 [mm]	H1 [mm]	H2 [mm]	Fz max. [kN]	Fsp. max. [kN]	Fh max. [N]
A40/B50	TG 30-66	30	12	25	5	M8	4	11,42	20,5	28,5	36,5	5,7	2	4	12	70+20 N
A50/B63	TG 38-66	38	14	32	6,8	M10x1	5	14,13	25,5	35,6	45,5	6	2,5	8	24	220+30 N
A63/B80	TG 48-66	48	20	40	8,4	M14x1,5	6,3	18,13	33	45,5	58	6	2,5	10	30	250 N
A100/B125	TG 75-56	75	28,5	63	12	M20x1,5	10	28,56	51	71	91	7,6	3	24	60	500 N

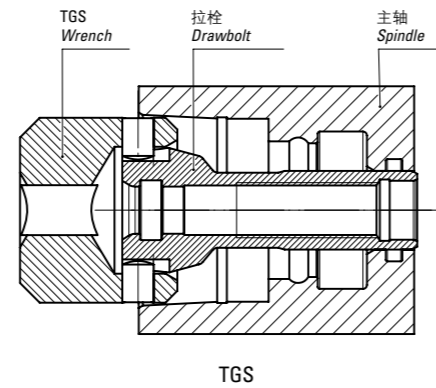
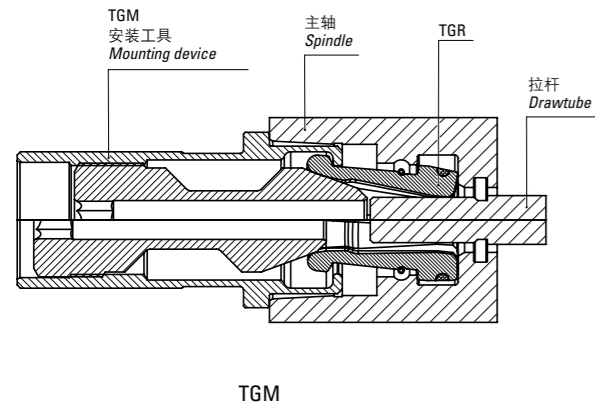
Tool-Grip 修复用拉刀爪

随着增长的机床主轴运行时间因为经常的刀具更换，HSK空心锥柄的端面和锥面会有磨损，使用修复用拉刀爪不再需要机床主轴被更换。在主轴调试的时候仅仅需要端面和空心锥柄的锥面0.2mm修磨，这个修复用拉刀爪就是为了修磨的0.2mm设计的，这样机床轴能很经济的调试。

ToolGrip HSK – Repair-Gripper-Set

The planned assets and the cone of the HSK entry in the spindle can wear with advanced operation. From now on it is not necessary any more to replace the complete machine spindle. Just use the repair-gripper-set. At the spindle service the planned asset and the cone have to be ground by 0,2 mm. The repair-gripper-set equalises these 0,2 mm. Therefore the spindles can be economically serviced.

HSK-尺寸 HSK-size	订货号 item no.	适合于 suitable to	维修尺寸 repair dimension	L3 [mm]	L4 [mm]	L5 [mm]
A25/B32	TG 19-61	TG19-06	0,25	13,25	17,75	23,75
A32/B40	TG 24-61	TG24-06	0,25	16,5	22,65	28,85
A40/B50	TG 30-61	TG30-06	0,25	20,5	28,25	36,25
A50/B63	TG 38-61	TG38-06	0,25	25,5	35,35	45,25
A63/B80	TG 48-36	TG48-06	0,2	33	45,3	57,8
A80/B100	TG 60-61	TG60-06	0,2	41	56,9	72,8
A100/B125	TG 75-63	TG75-06	0,2	51	70,8	90,8
A125/B160	TG 95-36	TG95-06	0,2	64	88,8	113,8
A160	TG 120-61	TG120-06	0,2	81	112,8	144,8



拉刀爪的安装

安装拉刀爪需要两个不同的工具。
安装硫化橡胶合成的夹爪TGR到机床轴将使用安装工具TGM。用这个安装工具可以使夹爪合在一起，以至于毫不费力导入机床轴。

拉栓的安装需要运用TGS，这样必须的扭矩达到防止松开的扣扣上。

请注意对于每个尺寸都需要特别的安装工具。

请问我们安装说明。

Mounting of Tool Gripper ToolGrip HSK

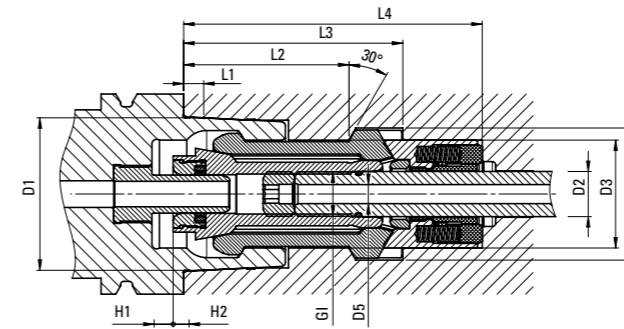
There are two different tools needed in order to mount the ToolGrip HSK grippers: The mounting fixture TGM is used in order to mount the vulcanised clamping segments TGR in the spindle. This fixture is clamping the clamping segments so that they can easily be inserted in the motor spindle.

The socket wrench TGS is used in order to mount the pull stud. This wrench is needed in order to generate the necessary torque for countering the stud.

Please note that special mounting fixtures are needed for each size.

Please ask for our mounting instructions.

HSK-尺寸 HSK-size	拉刀爪 tool gripper	安装装置 mounting fixture	扳手 socket wrench
A25/B32	TG 19	TGM 19	-
A32/B40	TG 24	TGM 24	TGS 24
A40/B50	TG 30	TGM 30	TGS 30
A50/B63	TG 38	TGM 38	TGS 38
A63/B80	TG 48	TGM 48	TGS 48
A80/B100	TG 60	TGM 60	TGS 60
A100/B125	TG 75	TGM 75	TGS 75
A125/B160	TG 95	TGM 95	TGS 95
A160	TG 120	TGM 120	TGS 120



UniGrip HSK

Uni-Grip HSK拉刀爪由拉栓，8瓣的夹爪和一个复位弹簧，这个复位弹簧使这些夹爪到位。这个夹爪使更高的转速40000转，与此同时有着高的夹持力成为可能。不言而喻的拉刀爪可以有各种的涂层，和抗磨损的涂层以及保持式品种。同时修复用的拉刀爪也是可以供货的。

UniGrip HSK

The UniGrip HSK tool-gripper is consisting of a pull stud, 8 single clamping segments and a reset-spring which holds the clamping segments in position. This tool-gripper allows highest rotation speed up to 40.000 min⁻¹ and this with increasing high clamping force. Of course that tool-gripper is also available in wear-resistant coated design as well as in ceramic or holding design available. A repair-gripper-set is also available.

HSK-尺寸 HSK-size	订货号 item no.	D1 [mm]	D2 [mm]	D3 [mm]	D4 [mm]	D5 [mm]	G1	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	H1 [mm]	H2 [mm]	Fz _{max} [kN]	Fsp _{max} [kN]	Fh _{max} [N]	设计 design
A63/B80	WG 48-03	48	14,6	34	41,6	6	M14x1,5	6,3	52	69	94	7	3	10	30	-	Standard standard
	WGB 48	48	14,6	34	41,6	6	M14x1,5	6,3	52	69	94	7	3	10	30	-	Beschichtet coated
	WGC 48-07	48	14,6	34	41,6	6	M14x1,5	6,3	52	69	94	7	3	10	30	-	Keramik ceramic
	WGB 48-21	48	14,6	34	41,6	6	M14x1,5	6,3	52	69	94	7	3	10	30	300	Haltend holding
A63/B80 Reparatur Repair	WG 48-26	48	14,6	34	41,6	6	M14x1,5	6,3	51,7	68,7	93,7	7	3	10	30	-	Standard standard
	WGB 48-26	48	14,6	34	41,6	6	M14x1,5	6,3	51,7	68,7	93,7	7	3	10	30	-	Beschichtet coated
	WGC 48-26	48	14,6	34	41,6	6	M14x1,5	6,3	51,7	68,7	93,7	7	3	10	30	-	Keramik ceramic
	WGB 48-25	48	14,6	34	41,6	6	M14x1,5	6,3	51,7	68,7	93,7	7	3	10	30	300	Haltend holding

安装装置 MoFix WGM 48-05

这个安装装置 MoFix 显著的减轻了拉刀爪的安装，特别是对于立式的机床轴，在安装完弹簧复位后，Mofix将被装在拉杆的螺纹上面，紧接着一个个的夹爪将被装在机床轴上，在 MoFix的帮助下，不仅仅是安装简化了，而且安装时间也是明显的缩短了。

Mounting Fixture MoFix WGM 48-05

The mounting fixture MoFix facilitates a lot the mounting of the tool gripper specially when the spindle position is vertical. The MoFix WGM is screwed on the thread of the pull bar after having mounted the reset spring. Then the single clamping segments can be inserted in the spindle. The MoFix is not only simplifying the mounting but it is also drastically shortening the mounting time.





ToolGrip SK

这个Tool-Grip SK 拉刀爪是很多年来可靠的产品系列对于自动刀具更换来说。您用DIN 69871/72的标准拉栓夹持斜锥刀具。6瓣的夹爪系统有着一个优化的力分配，这样就有更可靠的夹持力，这是适合更快的工作循环。

根据需求所有的拉刀爪都是防磨损涂层设计的，如需求此类设计，欢迎垂询。

我们可以适配您的每个应用情况，例如：

- 增强设计对于更大的夹持力
- 不同的夹持冲程的设计
- 附加密封的设计
- 压缩气体/KSM/MMS的设计

尺寸 size	订货号 item no.	D1 [mm]	D2 ^{H7} [mm]	D3 ^{+0.2} [mm]	D4 ₇ [mm]	D5 [mm]	GA	GI	L1 _{-0.3} [mm]	L2 ^{+0.2} [mm]	L3 [mm]	F sp. [kN]	H [mm]
SK30	BSK 2557-03	31,75	19	24	13	3	M10	-	47,8	64,8	59,4	9	5,0
	BSK 2557-02						-	M10x1				5	6,5
SK40	BSK 2602-03	44,45	27	35	19	6	M16x1,5	-	68,4	85	60,6	20	6,0
	BSK 2605						-	M16x1				15	6,0
SK45	BSK 2425-01	57,15	34	41	23	6	M20x1,5	-	82,7	101,5	93,2	25	8,0
	BSK 2425-02						-	M20x1,5				25	117,0
SK50	BSK 2528	69,85	41	50	28	8	M24x1,5	-	101,75	123,2	75,5	35	8,0
	BSK 2528-02						-	M24x1,5				35	117,2
SK60	BSK 2604	107,95	62	74	40	10	M32x1,5	-	161,8	188	93,2	60	8,0
	BSK 2604-12						-	M30x1,5				60	148,2

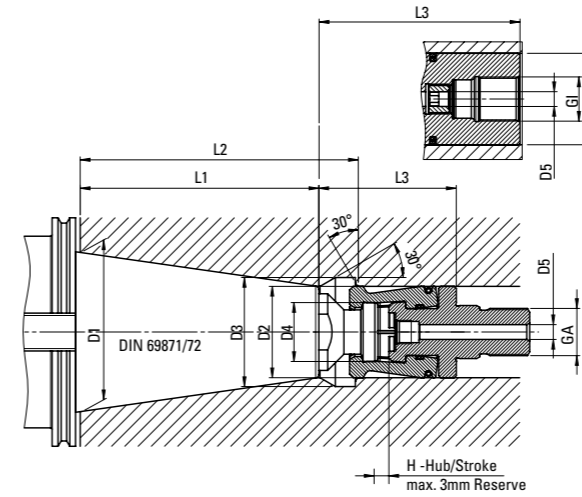
ToolGrip SK

The ToolGrip SK tool gripper are an approved serial product for automatic tool changing. They are clamping tools with ISO taper and pull stud acc. DIN 69871/72. The six-piece clamping segments have an optimal load balancing. Therefore a higher permitted clamping force is possible. And this at faster cycles.

On request all tool grippers are available in wear-resistant coated design. Please contact us!

With pleasure we modify the tool grippers according to your application. For example:

- Reinforced design for higher clamping forces
- Design with varying clamping stroke
- Design with additional sealings
- Design with air blast / coolant / minimal quantity lubrication delivery



复合SK

复合SK拉刀爪用DIN 69871/72拉栓夹持标准的大斜锥刀具。在同样的主轴内轮廓可以在同样的连接尺寸下通过简单的拉刀爪的更换用根据以下的标准别的拉栓夹持刀具：

- DIN 69871/72
- ISO 7388/1+2 (A/B)
- ANSI B5.50
- MAS-BT JIS B6339-1992

我们可以适配您的每个应用情况，例如：

- 增强设计对于更大的夹持力
- 不同的夹持冲程的设计
- 附加密封的设计
- 压缩气体/冷却液/最小数量润滑剂传输的设计

尺寸 size	订货号 item no.	D1 [mm]	D2 ^{H7} [mm]	D3 ^{+0.2} [mm]	D4 ₇ [mm]	D5 [mm]	GA	GI	L1 _{-0.3} [mm]	L2 ^{+0.1} [mm]	L3 [mm]	F sp. [kN]	H [mm]
SK30	BSK 2557-11	31,75	19	24	13	3	M10	-	47,8	56	47,6	9	4,0
	BSK 2557-16						-	M10				9	72,2
SK40	BSK 2537-06	44,45	27	35	19	6	M16x1,5	-	68,4	76,5	60,6	20	5,5
	BSK 2537						-	M24x1,5				15	6,0
SK45	BSK 2543-04	57,15	34	41	23	6,8	M20x1,5	-	82,7	94,9	85	25	6,0
	BSK 2543-03						-	M20x1,5				25	112,5
SK50	BSK 2615-02	69,85	43	50	28	6,5	M24x1,5	-	101,75	114,5	75,75	35	6,0
	BSK 2494						-	M24x1,5				35	128,25

其它形式拉刀爪欢迎询问！

Gripper for other standards on request!

MultiGrip SK

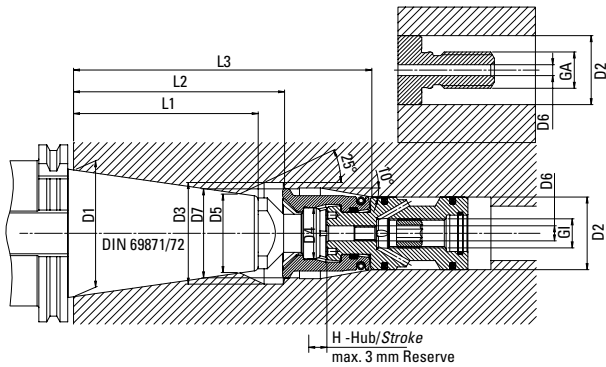
The MultiGrip SK tool gripper are clamping tools with ISO taper tools and pull stud acc. DIN 69871/72. It is possible to use tools with other pull studs with same connection dimensions in the same spindle internal contour by simply changing the tool gripper.

Following pull studs are possible:

- DIN 69871/72
- ISO 7388/1+2 (A/B)
- ANSI B5.50
- MAS-BT JIS B6339-1992

With pleasure we modify the tool grippers according to your application. For example:

- Reinforced design for higher clamping forces
- Design with varying clamping stroke
- Design with additional sealings
- Design with air blast / coolant / minimal quantity lubrication delivery



UniGrip SK

这个Uni-Grip SK 拉刀爪用DIN 69871/72拉栓夹持标准的大斜锥刀具，6瓣的夹爪系统有着一个优化的力分配，这样就有更可靠的夹持力，这是适合更快的工作循环。在同样的主轴内轮廓可以在同样的连接尺寸下通过简单的拉刀爪的更换用别的拉栓夹持刀具。

适合的拉栓根据：

- DIN 69871/72
- ISO 7388/1+2 (A/B)
- ANSI B5.50
- MAS-BT JIS B6339-1992

我们可以适配您的每个应用情况，例如：

- 增强设计对于更大的夹持力
- 不同的夹持冲程的设计
- 附加密封的设计
- 压缩气体/冷却液/最小数量润滑剂传输的设计

UniGrip SK

The UniGrip SK tool gripper are clamping tools with ISO taper tools and pull stud acc. DIN 69871/72. The six-piece clamping segments have an optimal load balancing. Therefore a higher permitted clamping force is possible. And this at faster cycles. On request all tool grippers are available in wear-resistant coated design. Please contact us! It is possible to use tools with other pull studs with same connection dimensions in the same spindle internal contour by simply changing the tool gripper. Following pull studs are possible:

- DIN 69871/72
- ISO 7388/1+2 (A/B)
- ANSI B5.50
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- Design with air blast / coolant / minimal quantity lubrication delivery

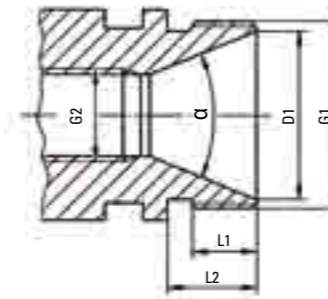
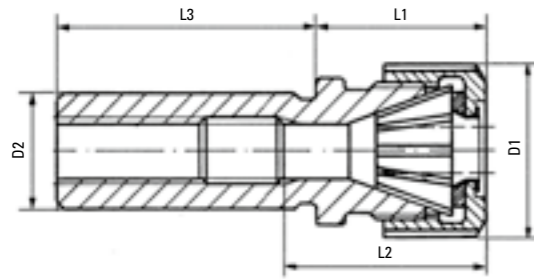
尺寸 size	订货号 item no.	D1 [mm]	D2 ^{H7} [mm]	D3 [mm]	D4 [mm]	D5 [mm]	D6 [mm]	D7 ^{H7} [mm]	GA	GI	L1 _{-0,3} [mm]	L2 _{-0,1} [mm]	L3 [mm]	F sp. [kN]	H [mm]
SK30	BSK 2557-15	31,75	19	27	13	19,5	3	22,5	M10	-	47,8	59	76	9	6,0
SK40	BSK 2651-18	44,45	27	40	19	27,6	5	34	M16x1,5	-	68,4	79,5	113	20	6,5
	-								M16x1,5						
SK50	BSK 2666-02	69,85	40	56	28	43	7	49	M24x1,5	-	101,75	116,5	166	30	6,5
	-								M16x1,5	163,7					

其它标准拉爪可以询问!

Gripper for other standards on request!

DIN 1835 Teil 1 ISO 3338-2 Form B

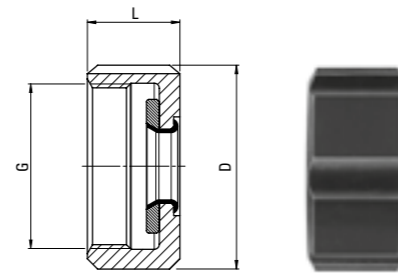
DIN 6345



带圆柄的刀柄 对于Rubber-Flex® RFCJ 夹钳

Drill Holders with Parallel Shank for Rubber-Flex® RFCJ Collets

类型 type	圆柄 D2 shank D2	夹持范围 clamping range [mm]	订货号 item no.	D1 [mm]	L1 max. [mm]	放入深度 L2 stopscrew L2		L3 [mm]
						min. [mm]	max. [mm]	
41	5/8"	1 - 6,5	OZ 3160	21	23	20	43	50
	3/4"		OZ 3161			24	59	52
	16 mm		OZ 3162			20	43	50
	20 mm		OZ 3163			24	59	52
42	3/4"	2 - 10	OZ 3170	31	28	28	59	52
	1"		OZ 3171			28	59	58
	20 mm		OZ 3173			28	59	52
	25 mm		OZ 3172			28	59	58
44	1"	1,8 - 13	OZ 3180	40	29	33	59	58
	1-1/4"		OZ 3181			29	62	52
	20 mm		OZ 3184			31	62	52
	25 mm		OZ 3182			29	59	58



刀柄的夹钳和扳手

Clamping Nuts and Wrenches for Drill Holders

类型 type	夹钳号 for collet no.	夹钳订货号 item no. "nut"	D [mm]	L [mm]	G	扳手订货号 item no. "wrench"
41	J115, J116, J117	OZ 3157	21	14	M16 x 1	Type 41
42	J420, J421, J422, J423	OZ 3158	31	18	M24 x 1,5	Type 42
44	J440, J441, J443, J444	OZ 3159	40	18	M32 x 1,5	Type 44
44	J440, J441, J443, J444, J445	OZ 3159/S1	40	18	M32 x 1,5	Type 44
46	J460, J461, J462	N 460	56,4	25,4	Tr 1,850" x 14	K460

Rubber-Flex® RFCJ 对于刀柄和攻丝卡盘

Rubber-Flex® RFCJ for Drill Holders and Screwing Chucks

RFCJ夹钳的优点是:

- 对于带圆柄的钻头和丝锥
- 更大的夹持范围减少费用
- 复合钢平行移动到总的夹持范围
- 更高的径向夹持力
- 在夹持范围上稳定的圆跳

The advantages of the RFCJ collets are obvious:

- For drills and taps with parallel shank
- Large gripping range reduces costs
- Multi-steel segments close down parallel over the full range
- Strong radial grip on tool shank
- Consistently good runout performance over the full range of a collet

类型 type	夹持范围 clamping range	订货号 item no.	D1-0,2 [mm]	G1 [mm]	G2 [mm]	L1 [mm]	L2 [mm]	α [°]
41	1 - 2,5	RFCJ 115	13,3	M16x1	M10	8,5	12	26
	2,5 - 4,5	RFCJ 116						
	4,5 - 6,5	RFCJ 117						
42	2 - 4,5	RFCJ 423	20,5	M24x1,5	M12	11	15	40
	4,5 - 8	RFCJ 420						
	3,5 - 6,5	RFCJ 421						
	6,5 - 10	RFCJ 422						
44	1,8 - 4,5	RFCJ 444	28,5	M32x1,5	M16	11	15	45
	4,5 - 10	RFCJ 441						
	2,8 - 7	RFCJ 443						
	7 - 13	RFCJ 440						
	9 - 15	RFCJ 445*						
46	6 - 10	RFCJ 460	41,78	Tr1,85"x14	23,5	16	21	50
	10 - 16	RFCJ 461						
	16 - 23	RFCJ 462						

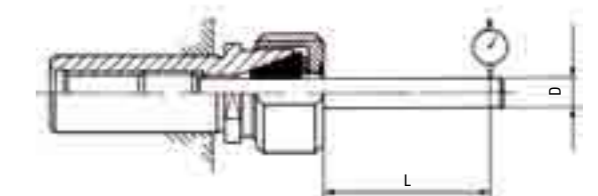
* 仅仅和 OZ 3159/S1 联系使用

* only usable with clamping nut OZ 3159/S1

Rubber-Flex® 圆跳测试表

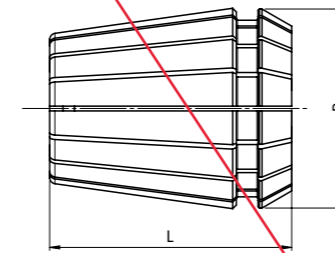
Rubber-Flex® Runout chart

D über/over bis/to	L [mm]	标准 [mm]	高精度 high accuracy [mm]
1.0	1.9	10	0,03
1.9	2.5	15	
2.5	3.0	20	
3.0	4.0	25	
4.0	5.0	30	
5.0	6.0	35	
6.0	8.0	40	
8.0	10.0	45	0,02
10.0	15.0	50	



DIN ISO 10897

DIN 6499 ISO 15488 Form B



原装Ortlieb高效夹钳对于工件夹持

- 细长的锥面达到大的夹持力和高的松开扭矩
- 适合高的径向和轴向负荷
- 自锁功能
- 安全和定心夹持
- 高的跳动精度保证由于细致的材料选择和淬火
- ORTLIEB夹钳适合所有机床主轴根据 DIN6388/ ISO 10897 Form C

The Genuine Ortlieb Fullgrip Collets for Toolholding

- Slim collet taper combined with long collet bore assures strong grip and rigidity
- The collet system has been designed for all kinds of heavy duty operations
- Self-locking
- High accuracy is guaranteed over a long life due to high quality steel and careful heat treatment
- The Ortlieb collet fits all types of machine spindles made in accordance with DIN 6388 / ISO 10897 Form C

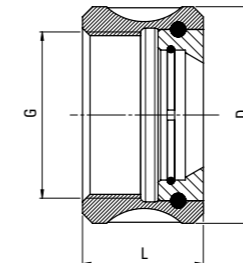
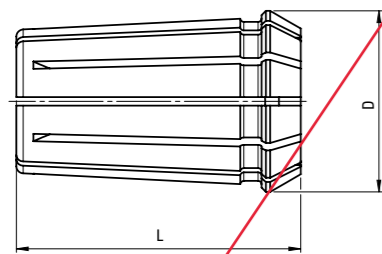
对于刀具夹持带8度锥面夹钳

Toolholder Collets with 8° Taper

名称 name	标准直径 clamping range [mm]	订货号 item no.	OZ-号码	D [mm]	L [mm]	调整角度 setting angle [°]
ER 11	1 - 7	4008 ...	3773	11,7	18	8
ER 16	1 - 10	0426 ...	3784	17	28	8
ER 20	1 - 13	0428 ...	3785	21	32	8
ER 25	1 - 16	0430 ...	3786	26	34	8
ER 32	2,5 - 20	0470 ...	3787	33	40	8
ER 40	4 - 26	0472 ...	3788	41	46	8

DIN ISO 10897 Form B

DIN ISO 10897 Form D



夹钳双面切槽带锥面1:10刀具夹持

订货号 item no.	夹持范围 clamping range [mm]	OZ-号码	D [mm]	L [mm]
0415 ...	2 - 16	3465	25,5	40
0462 ...	2 - 25	3466	35,05	52
0467 ...	6 - 32	3467	43,7	60
0468 ...	12 - 40	3469	52,2	68

Toolholder Collet Double Slitted with 1:10 Taper

- Recommended as a drill holder collet
- Consistent strong grip over the full range of -0.5 mm
- Extraordinarily long collet bore resulting in strong grip
- Drills can be short clamped on the chamfer
- Rigid tapping without positive drive on square end of tap

带轴承压环的夹栓

Ball Bearing Nuts

夹持范围 clamping range	Art. Nr. item no.	D [mm]	L [mm]	G	扳手号码 item no. Wrench
1 - 6	OZ 1809*	18	14	M14 x 1	90 006
1 - 8	OZ 1820*	26	19	M20 x 1,5	90 008
1 - 10	OZ 1821*	30	19	M22 x 1,5	90 010
1 - 12	OZ 1822*	35	20	M27 x 1,5	90 012
2 - 16	OZ 1823	43	24	M33 x 1,5	90 016
2 - 20	OZ 1824	50	28	M42 x 2	90 020
2 - 25	OZ 1825	60	30	M48 x 2	90 025
4 - 32	OZ 1826	72	33,5	M60 x 2,5	90 032
6 - 40	OZ 1827	85	37	M68 x 2,5	90 040

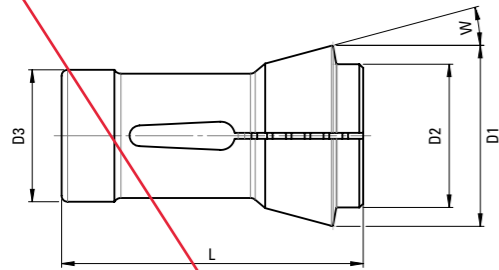
* 一体夹栓

* solid nut

- 夹钳特别适合钻削
- 锁力夹持到公差-0.5mm
- 大的有效的夹持长度
- 钻头也可斜边短夹持
- 丝锥不带四边

压紧式夹钳 Dead Length Collets

DIN 6343



标准压紧式夹钳

Standard Dead Length Steel Collets

订货号 item no.	OZ号	D1 [mm]	D2 [mm]	D3 [mm]	L [mm]	锥面角度 spindle cone angle "W" [°]	最大的通孔 max capacity [mm]		
							○	◇	⬡
0125...	OZ 87	22	16	17,5	51	15	14	9	12
0136...	OZ 747	26	19	20	54	15	16	11	14
0140...*	OZ 642	30	21	22	55	15	16	10	14
0145...	OZ 2464	35	27	25	77	16	20	14	17
0148...*	OZ 639	38	28	28	70	15	24	16	20
0161...*	OZ 609	45	34	32	75	15	26	18	22
0163...*	OZ 644	48	38	35	80	15	30	22	26
0171...	OZ 546	55	42	42	94	15	36	26	30
0173...*	OZ 612	60	50	48	94	15	42	30	36
0185...*	OZ 797	84	73	66	110	15	60	40	50
0193...	OZ 2712	107	92	90	130	15	80	57	70

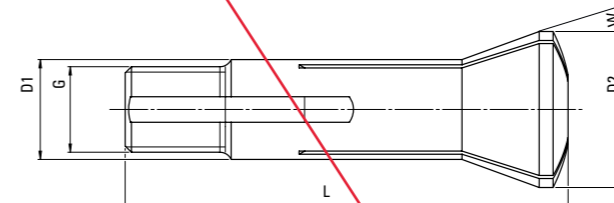
* 就此可以更换Rubber-Flex® RFC夹钳

* interchangeable with Rubber-Flex® RFC collets

dead length collets
see page 30

后拉式夹钳 Drawback Collets

DIN 6341



标准后拉式夹钳

Standard Drawback Collets

订货号 item no.	OZ号	D1 [mm]	D2 [mm]	L [mm]	锥面角度 spindle cone angle "W" [°]	G	最大容量 [mm] max capacity [mm]	
							通孔 throughhole	台阶
0302...	OZ 201	8	12,5	35,5	20	6,85 x 40 Pitch	4,5	7
0319...	OZ 1468	12	18	63,4	20	Tr 12 x 1	8	9,5
0324...	OZ 233	15	21,5	56	20	M13 x 1	9	13
0330...	OZ 1469	16	24	74,2	20	Tr 16 x 1,5	11	13
0349...	OZ 190	20	26,3	73	15	S 20 x 1,66	15	20
0351...	OZ 1470	20	28	84,7	20	Tr 20 x 1,5	15	17
0355...	OZ 1256	20	28	122,7	17°30'	S 20 x 2	12,5	18
0358...	OZ 234	23	32	86,5	20	21,25 x 1	16	20
0359...	OZ 1471	23	32	93,4	20	Tr 23 x 1,5	18	20
0364...	OZ 1588	25	33,7	97,6	15	S 25 x 15 Pitch	18,5	22
0367...	OZ 1472	28	38	106,7	20	Tr 28 x 1,5	22	24
0385...	OZ 5011	31,75	37,5	87	10	1,245" - 20	26	28
0386...	OZ 1473	32	45	116	20	Tr 32 x 1,5	27	29

工件夹持
Workpiece Clamping

自动拉刀系统
Automatic Tool Clamping

刀具夹持
Tool Clamping

工件自动化
Workpiece Automation



客户要求设计的非标夹具对于自动化工件更换

很多年以来在切削工业自动化技术已经进入其中，带机器人送料的加工中心现在已经是平常的：已加工和未加工的零件的自动化处理。

很多年以来我们供给客户要求设计的非标夹具，以达到工艺缩短，尽量一个夹持下完成整个加工的目的，我们很愿意根据您的需求设计工件夹持，请联系我们。

您的效益：

- 更短的工件更换时间通过机械的或者是液压的工件夹持在机床里外。
- 在使用熟悉的连接单元情况下如HSK，自动更换WSA夹具
- 作为选项WSA夹具也可以分头更换。

Customized Workpiece Clamping Systems also for Automatic Changing of Workpieces WSA

The automation has been introduced in the metal working industry since several decades. It started with bar feeder. Nowadays robots are already standard in complex machining centres for automatic handling of unmachined and machined workpieces.

Since several years we are offering customized workpiece clamping systems which all have one target: the process shortening of complete processing in preferably one setting with adaptive workpiece clamping technology. With pleasure we are modifying the workpiece clamping according to your application. Please contact us!

Your benefit:

- Short workpiece change time due to mechanic or hydraulic clamping of workpieces inside and outside of the machine
- Automatic change of the WSA-clamping device with use of known interfaces like HSK
- As an option the WSA-clamping devices can be changed on dividing heads



带工件
with workpiece



不带工件
without workpiece

工件：

薄壁的用深长的钢片做成的发动机外壳

要求：

外径夹持通过弹性薄膜单元，夹持力可以通过附加的弹簧单元无级调整。

机床连接：

短锥 5 DIN 55026/27

功能：

这个卡盘能通过四个夹爪以及轴向止动块的更换适用各种零件，夹持是通过弹性薄膜，通过附加的弹簧单元夹持力可以无级调整，松开是通过气动缸，这个薄膜的夹持理念保证一个更少的干涉以及更好的防灰作用。

Workpiece:

Thin-walled motor housing made of deep-drawn steel sheet

Requirement:

External clamping by elastic diaphragm element. Clamping force adjustable by additional spring element.

Machine connection:

Short taper flange KK5 DIN 55026/27

Function:

The changeover for different workpieces can be made by changing the clamping jaws and the endstop. The clamping is initiated by the elastic diaphragm element. The clamping force is adjustable by means of an additional spring element. A pneumatic cylinder is releasing the system. The diaphragm chuck principle ensures a high availability and reduces the danger of contamination.



工件：

带孔的传动轴（锻件）

要求：

带高的径向夹持力的内径夹持，防灰设计

机床连接：

短锥 6 DIN 55026/ 24

功能：

液压驱动的带尖齿的芯轴。通过涨栓夹持，在松开后通过径向弹簧这个滑瓦被压到他的起始位置，通过完全合适滑瓦本体可以达到防灰效果。

Workpiece:

Forged hollow drive shaft

Requirement:

Internal clamping with high radial transmission force. Contamination resistant design.

Machine connection:

Short taper flange KK6 DIN 55026/27

Function:

Hydraulic operated clamping mandrel with spiky toothed horn cheek. Clamping is done by a expanding bolt. A radial spring is pressing the horn cheeks back in the initial position. An accurately fitting of the cheeks reduces the danger of contamination at the moving parts.



工件:
燃气涡轮的涡轮叶片

要求:
适用机器人操作更换夹持适配器, 夹持是通过外部的电动螺丝起子操作的, 防灰设计。

机床连接:
HSK 100 DIN 69893 modifiziert

功能:
机器人移动夹持适配器到安装位置, 那里带鸠尾榫[槽]的工件放入适配器和通过电动螺丝起子夹紧, 这个机器人传输这个适配器到CNC机床, 这个夹持适配器是防灰设计的。

Workpiece:
turbine blade for gas turbine

Requirement:
Clamping adapter for robot handling. Clamping by external electric screw driver. Contamination resistant design.

Machine connection:
HSK 100 DIN 69893 modified

Function:
A robot system transports the adapter in the setup station. The dovetailed workpiece is placed in the adapter and clamped by an electric screw driver. The robot system transports the adapter to the CNC-machine. The adapter is hermetical sealed against contamination.



工件:
薄壁的衬套

要求:
在双轴NC车床上夹持, 两面加工, 没有后拉作用, 带端面气检, 夹持长度140mm, 夹持直径94mm, 旋转跳动小于0.015, 防灰设计。

机床连接:
Kurzkegel 6 DIN 55026/27

功能:
这个夹钳卡盘是液压驱动的, 工件夹持是通过Rubber-Flex夹钳实现, 夹钳可以通过插旋连接快速更换, 夹持是位置中立的, 这个工件位置是由气检确定位置的, 卡盘已作防灰密封。



Workpiece:
thin walled reducing bush

Requirement:
Clamping on double spindle NC lathe for 2 side machining. Without pull-in effect, with air sensor, clamping length 140 mm, clamping diameter 94 mm, runout smaller 0,015 mm. Contamination resistant design.

Machine connection:
short taper flange KK6 DIN 55026/27

Function:
The chucks is hydraulically clamped whereas the clamping is done by a Rubber-Flex collet. The collet can be quickly changed by bayonet lock system. The clamping process is position neutral. Workpiece position is assured by air sensor. The chuck is sealed against contamination.

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General Terms and Conditions of Sale

[effective 01/11]

I. Scope

- Our General Terms and Conditions of Sale apply to all – including future – legal relationships between the parties to the Contract. Agreements to the contrary are only valid if confirmed by us in writing.
- We are not bound by any contrary or contradictory General Terms and Conditions of the other party to the Contract – hereinafter referred to as the Purchaser – even if we do not expressly object to them.
- Our Terms and Conditions only reply in respect of Companies as defined in § 310 Section 1 BGB (Civil Code).
- Should any provision contained in our General Terms and Conditions of Sale prove to be or become invalid the validity of all remaining provisions shall not be thereby affected.

II. Tender and Tender Documentation

- Our tender is subject to confirmation in the absence of anything to the contrary ensuing from the offer.
- We can accept orders within a period of 6 weeks. The said period commences upon receipt of order.
- Our written Confirmation of Order is definitive in respect of supply of goods or services. Assurances regarding characteristics, supplements or ancillary agreements must be in writing to take legal effect.
- Our sales staff are not authorised to enter into verbal ancillary agreements or to give assurances extending beyond the content of the written Contract.
- We retain title and intellectual property rights to all diagrams, drawings, calculations and other documentation. Prior to transmission thereof to third parties the Purchaser requires our express written permission.
- We are entitled to make part deliveries if this may be considered reasonable for the customer.

III. Prices and Terms of Payment

- If nothing to the contrary emerges from the Confirmation of Order our prices are „ex stock“ or „ex works“ and exclusive of shipping and handling charges, customs or excise duty, packaging and are liable to the prevailing rate of statutory VAT.
- Minimum value of goods per order is EUR 25.00 net.
- Separately invoiced are market-dependent surcharges for raw materials at current daily prices. Similarly, services over and above the purchase price plus additionally agreed work are separately invoiced. We reserve the right to adjust our prices accordingly if subsequent to conclusion of the Contract cost reductions or cost increases, in particular as a consequence of collective wage agreements, changes in the cost of materials or currency fluctuations take place. Evidence of the above shall be made available to the Purchaser on request.
- Deduction of discount requires separate written agreement. If nothing to the contrary emerges from the Confirmation of Order the net purchase price shall be due for payment (without deduction) within 8 days from date of invoice. Part invoices shall be presented for part deliveries. Payment terms shall run separately for each part invoice. Statutory provisions apply in the event of payment arrears. Discounts are forfeit and payment due immediately if there is payment default in respect of any other goods or services. This also applies in the event of any out-of-court composition proceedings or any court insolvency proceedings with effect from the point in time of application.
- We only accept drafts or cheques in payment and not in lieu of payment after separate agreement. Our account is not settled until the date on which the funds are available to us without having to make allowance for charge-back claims. Collection charges, discount charges or bill charges including interest shall in all cases be borne by the Purchaser and are payable immediately.
- The Purchaser may only offset against a claim which is undisputed or legally binding. He may only exercise a right of retention to the extent that his counterclaim is based on the same contractual relationship.
- One-off costs such as for example tooling and development costs are invoiced at 50 % directly upon receipt of order. The remaining 50 % of the said costs are due upon delivery of the first series production components.

IV. Product Information and Design Modifications

- The Purchaser undertakes to provide us with a comprehensive description of every aspect and detail of the conditions under which the goods supplied shall be used.
- We reserve the right to introduce design modifications in the interests of technical progress provided the latter do not involve any changes in the function of the goods.

V. Delivery Period

- Information regarding delivery periods is unbinding unless the delivery date has been exceptionally agreed as „binding“.
- The delivery period shall commence with the date of confirmation of order but not however prior to provision of items required to be furnished by the Purchaser i.e. supporting documentation, official approvals and releases including receipt of any agreed payment, opening of any letter of credit required or evidence of arrangement of any collateral agreed.
- The delivery period shall be deemed met if the goods have left the Zell unter Aichelberg warehouse facility within the delivery period.
- Should any unforeseen impediments outside our control arise which despite the requisite care required given the particular circumstances of the case we are not in a position to avert – irrespective of whether the said impediments occur with us or at subcontractors – including force majeure (e.g. war or natural catastrophe) or delays in the supply of essential raw materials or other circumstances for which we are not responsible – we are entitled to withdraw from the Supply Contract either wholly or in part or alternatively to extend the delivery period by the duration of the impediment. We shall be entitled to the same rights in the event of strikes and lockouts at our premises or those of our upstream suppliers. We shall immediately notify our customers of any such circumstances.
- In the event of delay in delivery the Purchaser may, following the expiry of an appropriate period of grace to no effect, withdraw from the Contract; in the event of the practical impossibility of supply of goods on our part he is also entitled to do so without notice. A period of 14 days shall be deemed appropriate and in the case of special custom-made products this shall be a minimum of 1 month. Delayed delivery shall equate to impossibility if delivery does not follow after 2 months or 12 weeks in the case of special custom-made products. Claims for damages (including any consequential loss) shall be excluded irrespective of Section 6; the same shall apply in the case of reimbursement of expenses.
- The liability disclaimer provision under Section 5 shall not apply if any exclusion or restriction of liability is agreed in respect of injury to life, physical injury or damage to health which is due to intentional or negligent dereliction of duty on the part of the user or intentional or negligent dereliction of duty on the part of any legal representative or vicarious agent of the user; nor shall it apply if any exclusion or limitation of liability is agreed for other forms of damage caused by any intentional or grossly negligent dereliction of duty on the part of any legal representative or vicarious agent of the user. If we culpably infringe any essential contractual obligation or

any cardinal obligation liability shall not be excluded but shall be limited to typical foreseeable contractual damage. In the event of reimbursement of expenses the above shall apply accordingly.

- If any commercial fixed date transaction has been agreed the liability limitations arising from Sections 5 and Section 6 shall not apply; the same applies if the Purchaser is in a position to claim that as a consequence of the delay for which we are responsible his interest in performance of the Contract ceases to apply.
- In the case of call orders calls shall be notified to us in a timely manner to enable orderly manufacture and supply and at least 6 weeks prior to the desired delivery date. Call orders must be called forward within 12 months from the date of order if no other fixed deadlines have been agreed. If call does not follow or not completely within 12 months from the date of order or on the agreed call terms the Purchaser shall be deemed in default of acceptance.
- Should the Purchaser fall into acceptance arrears or infringe duties of cooperation we are entitled to claim compensation for loss incurred by us including any additional expenses. In such event risk of accidental destruction or loss or accidental deterioration of the item of purchase shall transfer to the Purchaser if the latter is in default of acceptance.

VI. Transfer of Risk, Packaging Costs and Insurance

- Upon handover to the forwarding agent or carrier and at the latest upon leaving our premises risk of accidental destruction or loss and accidental deterioration transfers to the Purchaser. Incorporated 2000 „ex works“ Clause (German version) applies.
- Should handover be delayed due to any circumstance for which the Purchaser is responsible or as a consequence of the latter's instructions risk shall transfer to the Purchaser with effect from the date of notification of readiness for despatch. At the express written request of the Purchaser we undertake to insure goods stored with us at the Purchaser's cost. This also applies in those cases where a delivery period has not been expressly agreed with the proviso that risk transfers to the Purchaser 7 calendar days following notification of readiness for despatch.
- If the Purchaser wishes we shall cover delivery by transport insurance; costs in this regard shall be borne by the Purchaser.
- Transportation and all other packaging shall not be returned subject to requirements of the German Packaging Ordinance. Pallets are excluded. The Purchaser undertakes to arrange disposal of packaging materials at his own cost.
- Delivered items shall be received and accepted by the Purchaser even if they display minor imperfections irrespective of his rights under the terms of §§ 433 ff. BGB.

VII. Reservation of Title

- Up to the point of full settlement of the purchase price including all subsidiary claims and prior to settlement of all other claims arising from the business association goods delivered shall remain our property. Up until that point the Purchaser is not entitled to pledge the goods to third parties or to assign them as security. The Purchaser shall store the reserved goods for us at no charge.
- In the event of processing and combination of reserved title goods with other goods by the Purchaser we shall acquire joint title to the new item in the ratio of the invoiced value of the reserved title goods to the combined material entity. The joint title rights accordingly ensuing shall be considered as reserved title goods as defined in Clause 1.
- The Purchaser is entitled to sell the reserved title goods in the due process of sale provided he is not in payment arrears in respect of our purchase price claims.
- The Purchaser hereby assigns to us at this point in time all claims accruing to him as a result of resale of the reserved title goods vis-à-vis third parties. If the reserved title goods are sold following processing, combination or amalgamation assignment of the claim arising from resale shall apply only up to the extent of the value of the reserved title goods invoiced to the Purchaser by the Vendor. This shall also apply if the reserved title goods are resold together with other goods which similarly do not belong to the Vendor.
- The Purchaser is also authorised to collect the claim even following assignment. We may restrict the said collection authorisation on the basis of justifiable interest or revoke the same on due cause found, in particular in the event of payment arrears. We may require that the Purchaser shall notify us of the claims assigned to him and of related debtors plus all information necessary for collection and surrender to us all associated documentation and disclose the said assignment to his debtors.
- We undertake to release the securities due to us on the basis of the above provisions at our discretion upon the Purchaser's request to the extent that their realisable value exceeds the claim secured by 20 % or more.
- The Purchaser hereby declares his consent that the persons authorised by us in connection with assignment of the reserved title goods may enter the property or building on or in which the items are situated in order to take possession of the reserved title goods.
- The Purchaser shall immediately inform us in respect of any confiscation, compulsory enforcement or other third party intervention adversely affecting our rights of ownership. The Purchaser shall bear the costs of measures to remedy third party interference in particular of any possible intervention procedures.

VIII. Guarantee and Liability

- Should there be any defect for which we are responsible we are entitled to decide between rectification and replacement at our own discretion. A precondition in such an event is that the defect is not immaterial. In the event of rectification we undertake to bear the costs of transportation, labour and materials provided these are not increased due to the fact that the goods supplied have not been moved to a location other than the place of performance. Should one of or both forms of remedy prove impossible or disproportionate we are entitled to refuse it. We may refuse to effect a remedy for as long as the Purchaser fails to meet his payment obligations towards us to an extent equating to the fault-free portion of the goods or services.
- Should rectification or replacement fail to be made within an appropriate period – with due consideration of our supply options – or if rectification and and/or replacement should fail the Purchaser may demand a reduction of remuneration (abatement) or withdraw from the Contract.
- The Purchaser's rights in the event of defect assume that the latter has met his obligation under § 377 HGB (Civil Code) to inspect and submit complaints upon receipt of the goods in a timely manner.
- If nothing to the contrary emerges under Section 6 below further claims on the part of the Purchaser, irrespective of legal grounds (in particular claims arising from infringement of main and ancillary contractual obligations, reimbursement of expenses with the exception of those defined in § 439 II BGB, impermissible act and any other tortious liability) are excluded; this applies in particular to damage not occurring to the item supplied itself including compensation claims for lost profit; also included are claims which do not result from the faulty nature of the purchased item.
- The above provisions also apply in the case of delivery of another item or a lesser quantity.
- The liability disclaimer provision under Section 4 shall not apply

if any exclusion or restriction of liability agreed for injury to life, physical injury or damage to health is due to intentional or negligent dereliction of duty on the part of the user or intentional or negligent dereliction of duty on the part of any legal representative or vicarious agent of the user; nor shall it apply if any exclusion or limitation of liability is agreed for other forms of damage caused by any intentional or grossly negligent dereliction of duty on the part of any legal representative or vicarious agent of the user.

If we culpably infringe any essential contractual obligation or any „cardinal“ obligation liability shall not be excluded but shall be limited to typical foreseeable contractual damage; in other respects it is excluded under Section 4.

The liability disclaimer additionally does not apply in those cases where under product liability legislation in the event of defects in the goods supplied there is liability in the case of personal injury or damage to property relating to privately used items. Nor does it apply in the case of assumption of a guarantee and assurance of a characteristic feature if a defect covered thereby activates our liability.

- In the event of reimbursement of expenses the above shall apply accordingly.
- No guarantee is assumed in the event of damage attributable to inappropriate use, faulty assembly by the Purchaser or third parties, natural wear and tear, incorrect or negligent treatment, improper modifications carried out without our prior consent or servicing work by the Purchaser or third parties.
- Claims for remedy, damages and replacement use shall be time-barred one year from the date of purchase of the item concerned. This does not apply to any item used in accordance with its customary purpose for a building and has caused faultiness in the latter in which case time-barring is after 5 years. Claims for abatement of price and exercise of any right of withdrawal are excluded if the claim for remedy is time-barred. In the event of operation of Sentence 3 however the Purchaser may only refuse payment of the purchase price to the extent that he would be entitled to do so as a consequence of withdrawal or abatement; in the event of withdrawal exclusion and subsequent payment refusal we are entitled to withdraw from the Contract.
- Claims arising from manufacturer redress remain unaffected by this Section.

IX. Liability for Collateral Obligations

If through any fault on our part the item supplied cannot be used as stated under the terms of the Contract or if damage occurs as a consequence of omitted or faulty implementation of suggestions and consultations prior to and subsequent to conclusion of the Contract including other contractual collateral obligations to the exclusion of further claims on the part of the Purchaser the provisions of Clauses VIII and X shall apply accordingly.

X. Withdrawal by the Purchaser and other Liabilities on our part

- The following provisions shall apply in the event of infringements over and above liability for defect and shall neither exclude nor limit statutory right of withdrawal. Similarly, lawful or contractual claims due to us shall be neither excluded nor limited.
- The Purchaser may withdraw from the Contract if the overall performance is definitively impractical, the same applying to incapacity. The Purchaser may also withdraw from the entire Contract if in the event of an order for similar items implementation of part of the supply is impossible in terms of numerical quantity due to our representation obligation and if he has no interest in partial supply. The Purchaser may also withdraw from the Contract if the consideration accordingly; the right of withdrawal shall not apply in the case of immaterial infringement of obligation.
- Should there be any delay in performance and provided the Purchaser grants us an appropriate period to complete performance following justification of the delay and should the said period fail to be observed the Purchaser shall be entitled to withdraw. In the event of partial delay in performance Section 1 Sentence 2 shall apply accordingly. If prior to delivery the Purchaser requires in any aspect alternative execution of the item supplied the delivery period shall be interrupted until the date of agreement regarding execution and if necessary extended by the time necessary for alternative execution.
- Withdrawal shall be excluded if the Purchaser is solely or to a large extent predominantly responsible for the circumstance entitling him to withdrawal or if the circumstance for which we are responsible occurs at the point in time of default in acceptance on the part of the Purchaser. In the event of impracticality we retain in the above cases our claim to consideration as defined in § 326 Section 2 BGB (Civil Code).
- Further claims on the part of the Purchaser, irrespective of legal grounds (in particular claims arising from default at the point of conclusion of the Contract, infringement of main and ancillary contractual obligations, reimbursement of expenses, impermissible act and any other tortious liability) are excluded; this applies in particular to damage not occurring to the item supplied itself including compensation claims for lost profit; also included are claims which do not result from the faulty nature of the purchased item. This shall not apply if the cause of damage is due to intent or gross negligence on our part, our legal representatives or vicarious agents. Nor shall this apply if the damage arises from culpable injury to life, physical injury or damage to health. To a similarly lesser degree liability in the event of assumption of a guarantee is excluded if an obligation infringement covered thereby activates our liability. If we culpably infringe any essential contractual obligation or any „cardinal“ obligation liability shall not be excluded but shall be limited to typical foreseeable contractual damage.

XI. Place of Performance and Jurisdiction

- Place of performance of both parts arising from all legal relationships is 73053 Göppingen.
- In respect of the legal relationship between the Purchaser and us the laws of the Federal Republic of Germany apply. UN Sale of Goods legislation (CISG) is expressly excluded.
- Legal venue for all disputes arising from the contractual relationship is Göppingen. We are also entitled to file an action at the domicile of the Purchaser.



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