

**POWDER
COMPACTION
TOOLING**

*Reference Clamping Systems
for Powder Compaction, Machining
and Tool Shop*



ProGrit

Innovative Production Technology

Table of contents

Powder Compaction Tooling Innovative Solution for the Compac-tion of Metal and Ceramic Powder	7
Precision / Compaction Technology	8
Positioning Systems – Precision Classes	8
Alignment System TPS-3i	8
Productivity – Set Up Times.....	9
Consulting & Engineering over the whole Powder Compaction Technology Chain	10
Concept, Design and Production of Complex and High Precise Compaction Tools.....	10
Pneumatic Support and Supervision of Reference Clamping Systems	10
Handling.....	10
RFID / Work and Data Flow / Technology Chain.....	11
Adaptation and Equipment of Tool Shop for Full or Partial Integration.....	11
Full Integration and Partial Integration of Work and Data Flow.....	12
Integral 8 Step Powder Compaction Tooling System Approach	12
Reference Clamping Systems for Compaction Processes up to 1000 tons.....	13
MRS Manual Core Rod Clamping System.....	15
Manual Core Rod Chuck MRS C.....	17
Pallet MRS P	18
Pallet MRS P ER and MRS P P ER with Collet for Smooth Core Rods	18
Pallet MRS P SP and MRS P P SP with Clamping Set for Smooth Core Rods.....	19
Spacer Shaft MRS to MRS Sprung and Unsprung.....	20
PRS Core Rod Clamping System	21
Core Rod Chuck PRS CP Pneumatic.....	24
Pallet PRS P Clamped Centered or Floated	24
Pallet PRS P P with Positioning System	25
Pallet PRS P ER with Collet for Smooth Core Rod	25
Pallet PRS P SP with Clamping Set for Smooth Core Rods.....	26
Adaptation MRS Chuck to PRS Pallet unsprung and sprung.....	27
Cover Pallet PRS PC	27
Manual Core Rod Clamping System PRS CM28 for Adaptations and Press Installationen without Compressed Air Supply	28
Core Rod Chuck PRS CM Manual.....	28
PPS Pneumatic Core Rod and Punch Clamping System.....	30
Basic Principle PPS Chuck	31
Types of PPS Reference Clamping Systems	31
Pneumatic Core Rod and Punch Chuck PPS C.....	32
Pallet Core Rod and Punch System PPS P.....	33
Adaptation MRS and PRS Chuck to PPS Pallet	34
PPS Reference Clamping System with Positioning System SCS K for Punches and Dies in any Shape	34
RCS II Roller Clamping System.....	35
Basic Principle RCS II Chuck.....	36
RCS II Chuck for Single and Multi Level Applications	37

Die and Punch Chuck RCS II with ADLC Coating	38
Die and Punch Chuck RCS II HP with ADLC Coating for High Pressure Forces	39
Die and Punch Chuck RCS II Power with ADLC Coating	40
Cover Pallet RCS CP	40
Punch Pallet RCS PPL without Gripper Groove	41
Punch pallet RCS PP with Gripper Groove	42
Die Pallet RCS PD	42
Die Pallet RCS PDH	43
Pallet RCS PPP for High Pressure Forces	43
Pallet RCS PPH for High Pressure Forces	44
Pallet RCS PPA with Gripper Groove for High Pressure Forces	44
Adaptation RCS II to PMC and Macro° / Refix°	45
Adaptation Manual PMC Chuck to RCS PA Pallet	45
Adaptation Manual Refix° Positioning System to RCS PPP135 Pallet	46
Sealing Ring for Pallet RCS PPP135	46
Adaptation Pneumatic PMC Chuck to RCS PA Pallet	47
Adaptation Pneumatic PMC Chuck to RCS PA Pallet	47
Adaptation RCS II to RCS II	48
Adaptation RCS II Chuck to RCS PA Pallet	48
Air Dock RCS / RCS II Clamping System	49
RCS II Chuck and Alignment Pallets for the Tool Shop	50
Die and Punch Chuck RCS II on Base Plate	50
Die and Punch Chuck RCS II HP on Base Plate	51
Alignment Pallet RCS PA	52
Alignment Pin RCS APA	52
Cover Pallet RCS CP	52
Quick Chuck 100 P and 130 P for RCS Pallets	53
Quick Chuck100 PM Manual for RCS Pallets with Draw Bar	53
Quick Chuck130 PM Manual for RCS Pallets with Draw Bar	53
Quick Chuck100 PP Pneumatic for RCS Pallets with Draw Bar	54
Base plate for Quick Chuck 100 PP without flushing	54
Draw Bar M 10 for Quick Chuck 100 PM, 100 PP und 130 PM	54
Draw Bar M 20 and M 42 for Quick Chuck 100 PM, 100 PP and 130 PM	55
Alignment Pin RCS APA	55
PMC Clamping System	56
Manual PMC Chuck	57
Manual PMC Chuck	57
Draw Bar for Manual PMC and Macro° Chuck	57
Pneumatic PMC Chuck	58
Pneumatic PMC Chuck	58
Draw Bar for Pneumatic PMC and Macro° Chuck	58
Pallets PMC for PMC chuck	59
Pallet PMC P15 54 x 54 x 12,5 for PMC and Macro° Chuck	59
Pallet PMC P15 54 x 54 for PMC and Macro° Chuck	59
Pallet PMC P15 d 75 x 12,5 for PMC and Macro° Chuck	59
Pallet PMC P15 D75 for PMC and Macro° Chuck	60
Adaptation manual RCS II Chuck to PMC and Macro° Pallet	60
Adaptation manual RCS II 60 Chuck to PMC and Macro° Pallet	60
Clamping Device for Adaptation of Manual RCS II 60 Chuck to PMC and Macro° Palette	60
MCS Manual Clamping System	61

Manual Die Reference Clamping System MCS D	61
Basic Principle MCS Die Chuck.....	62
Basic Principle MCS Die	62
Manual Die Chuck MCS D	62
Manual Die Reference Clamping System MCS DM - Clamping of Different Die Designs and Sizes.....	63
Manual Die Chuck MCS DM.....	64
Locking Pin for Handling of Bayonet Clamping Ring.....	64
Adaptation RCS II to MCS DM Pallet with SCS K Cones	65
Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones	65
Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones	66
Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones	66
Locking Pin for Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones.....	66
Adaptation for Refix [®] to MCS DM Pallet with SCS K Cones	67
Adaptation for Refix [®] Clamping System to MCS DM Pallet with SCS K Cones.....	67
Manual Punch Clamping System MCS PR, MCS PT and MCS PM for Single and Multi Level Application.....	68
Manual Punch Clamping System MCS PR.....	69
Manual Punch Clamping System MCS PM.....	70
Manual Punch Clamping System MCS PT.....	70
Single-Level-Application for Compaction of Iron and Tungsten Carbide Powder up to 1000 Tons Compaction Force	71
Multi-Level-Application for Compaction of Iron Powder up to 300 Tons Compaction Force	72
Manual Chuck MCS E.....	73
MCS Reference Clamping System for any Shapes	73
MCS Chuck and Alignment Pallets for Tool Shop	74
Manual Die Chuck MCS DM on Base Plate.....	74
Alignment Pallet MCS DM PA	74
Locking Pin for Handling of Bayonet Clamping Ring.....	74
MCS C Changeable Plate System	75
MCS C Changeable Plate with MCS DM and Clamping of Non Referenced Dies (Existing Dies)	76
MCS C Changeable Plate with MCS DM.....	77
MCS C Changeable Plate with RCS II.....	78
MCS C changeable plate with RCS II.....	78
MCS C260 Changeable Plate with Refix [®] Holes	79
MCS C Changeable Plate with Refix [®] Holes.....	79
MCS C260 Changeable Plate with SCS K System for Multi Axial Compaction	80
MCS C Changeable Plate with MCS for Multi Axial Compaction.....	80
Manipulation Fixtures for MCS C Changeable Plate	81
Manipulation Fixture for MCS C Changeable Plate.....	81
Locking Pin for Manipulation Fixture for MCS C Changeable Plate.....	81
SCS Segmented Clamping System	82
Basic Principle SCS Chuck.....	83
Basic Principle SCS Punch Carrier and Punch Plate.....	83
Die Chuck SCS D.....	84
Punch Chuck SCS P	85
Punch Carrier SCS PT.....	85
Multi Level Application for Compaction of Steel Powder up to Compaction Force of 300 Tons	86
SCS K Positioning System	87

SCS K Positioning Cone	87
Protection Pin for SCS K Positioning Cone	87
Mounting and Extraction Device for SCS K Positioning Cone	87
Control and Supply Unit.....	88
Supply Unit.....	88
Control Box with Pneumatic Indicator	88
Control Box with Digital Air Flow Monitor.....	89
Foot Pedal	89
Control Box Tool Shop	89
Booster Tool Shop.....	89
Compaction Tools and Filler Plates.....	90
Design and manufacture of complex and high-precision compaction tools.....	90
Compaction Tools for Multi Axial Compaction – Cross Hole, Closed, Opened and Splitted Die.....	90
Filler Plates Manual and Automatic.....	91
Filler Plate Manual.....	91
Filler Plate Manual with Powder Emptied Hopper for RCS II 135	91
Locking Pin for Handling of Filler Plate Ring.....	91
Filler Plate Automatic.....	91
Multi Axial Compaction System Side Compaction / Splitted Die.....	92
Die Body with Adjustable Mechanical Stops	93
Segment / Side Punch	94
Filler Plate.....	94
Electrical Drive Module	95
Manipulation Fixtures for Compaction Tools and Press Levels	96
Manipulation Fixture Die	96
Clamping Ring for Block Set Up of Die RCS 135 with Punch RCS 60 / RCS 95	96
Handling of Press Levels – Press Level Change Technology	96
Automation of Manufacturing of Tools and Compaction Processes.....	97
Tool Shop- Fully Automated Production of Compaction Tools.....	97
Quality Assurance – Fully Automated Measurement and Calibration of Compaction Tools with TCQ System.....	97
Press – Fully Automated Tool and Powder Set Up inclusive Automated Set Up of the Press.....	97
Alignment, Measurement and Analysis Systems	98

Pictograms

Following pictograms are used for a quick description of the applications and properties of the ProGrit products:

Product properties



Manual operation



Automatic operation



Operate with compressed air jet



Operate with manual pneumatic valve or control unit



Operate with electro pneumatic valve or control unit



Central flushing



Corrosion resistant

Fields of application



Electro discharge machining EDM



Wire electro discharge machining WEDM



Chip removal machining (turning, milling, grinding, drilling....)



Compacting, cutting, punching, ironing, forming

Trademarks of other, unrelated companies

EROWA and ITS are registered trademarks of EROWA AG.

° 3R, **3R**_{refix} and MACRO are registered trademarks of System 3R International AB or its affiliates.

Powder Compaction Tooling

Innovative Solution for the Compaction of Metal and Ceramic Powder

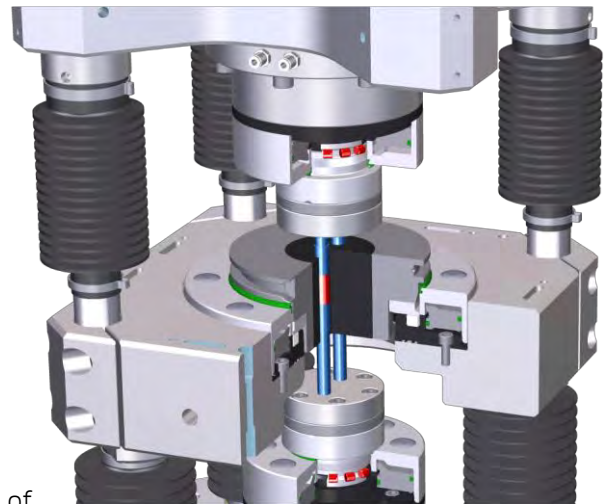
There are two main reasons for the usage of reference clamping systems for the compaction of metal and ceramic powders – precision / compaction technology and productivity.

Precision / Compaction Technology

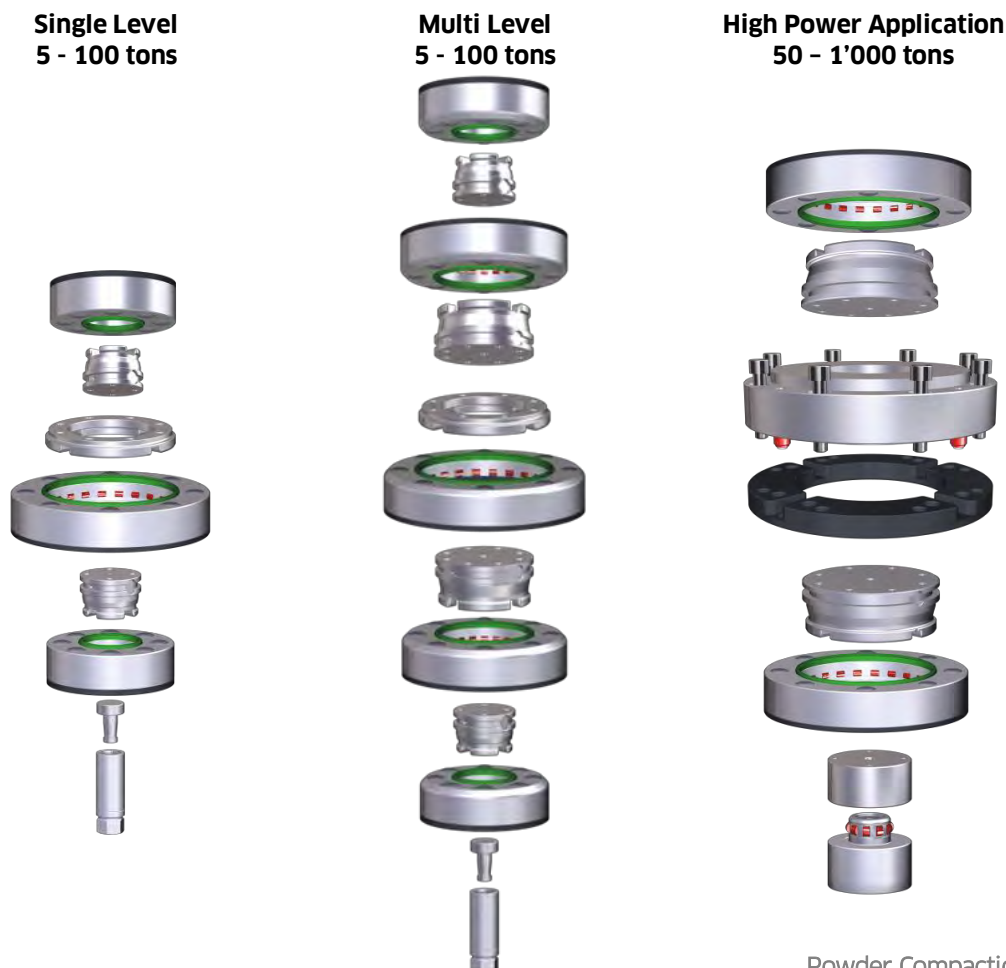
- Increase of compaction quality, burr less / burr free compaction
- Compaction of high precision green parts
- Reduction of compaction tool clearance
- Co axial compaction – splitted punch
- Multi axial compaction – cross hole, closed, opened and splitted die
- Compaction of multi cavities

Productivity

- Reduction of set up times forced due to decreased batch sizes
- Reduction of compaction tool costs due to increased wear and damage of tools
- Reduction of production costs and through put times of the compaction tools



ProGrit provides system solutions for different requirements - from tool design, compaction tools over the tool shop up to the reference clamping systems for the presses.



Precision / Compaction Technology

Burr free or burr less compacting requires highest precision in the tool shop, the press and the compaction process. The Powder Compaction System of ProGrit achieves this precision by high precision positioning of the tool clamping system and precise alignment of these positioning systems to each other in the press.

Positioning Systems – Precision Classes

Prism Power P
Precision class I



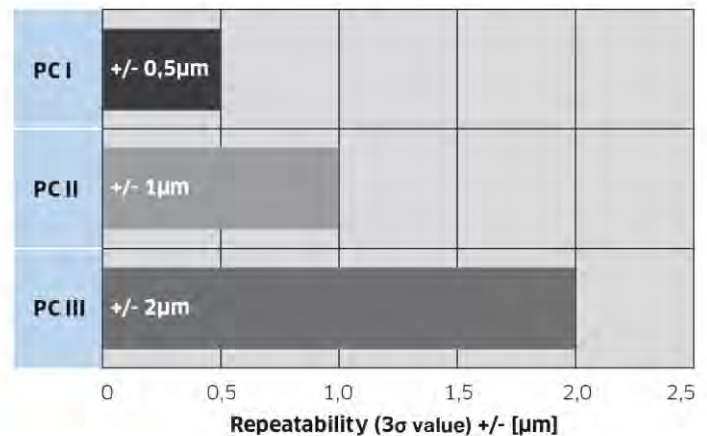
Cone SCS K
Precision class I-II



Spring Lip M
Precision class II-III



Precision Classes Positioning Systems



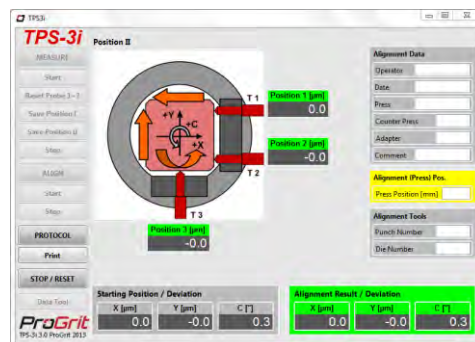
Alignment System TPS-3i

The Tooling Positioning System TPS-3i is able to align the reference clamping systems in the press in an accuracy of X, Y, Z better than 1 micron and in C better than 1 arc second to another. A perfect symmetrical distribution of the compaction clearance can be guaranteed through the TPS-3i technology.

Alignment accuracy of reference clamping systems in the press X, Y, Z < 1 micron C < 1 arc second



**Mobile measurement
module compact**

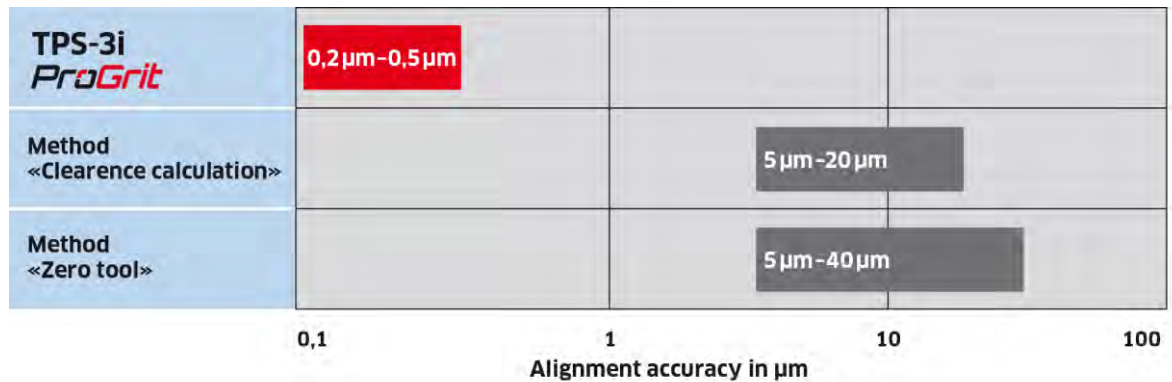


Software TPS-3i



**Measurement
tools TPS-3i**

Comparison of alignment accuracy for different alignment technologies



The ProGrit TPS-3i alignment technology delivers 10 to 40 times higher alignment accuracy than other on the market available alignment technologies.

Productivity – Set Up Times

Cost reduction by reducing set up times and concurrent elimination of tool damage in the compacting process results in pay back times of less than 0,5 years for the investment in a Powder Compacting Tooling System.

Total set up time = Change of tools + Alignment of tools



Consulting & Engineering over the whole Powder Compaction Technology Chain

ProGrit supplies customized developments, concepts und solutions for

- Reference clamping systems for single and multi-level applications
- Co axial compaction – splitted punch
- Multi axial compaction – cross hole, closed, open and splitted die
- Compaction with multi cavities
- Design and standardization of compaction tools and filler plates
- Development of manufacturing concept for the tool shop
- Measurement technology for measurement, correction and referencing of presses and die sets
- Measurement technology for alignment of reference clamping systems in the press
- Palletization technology for positioning of existing compaction tools and position correction of new produced compaction tools
- System integration in press and die set
- Production technology and adaption and set up of the tool shop
- Full automated powder and compaction tool change

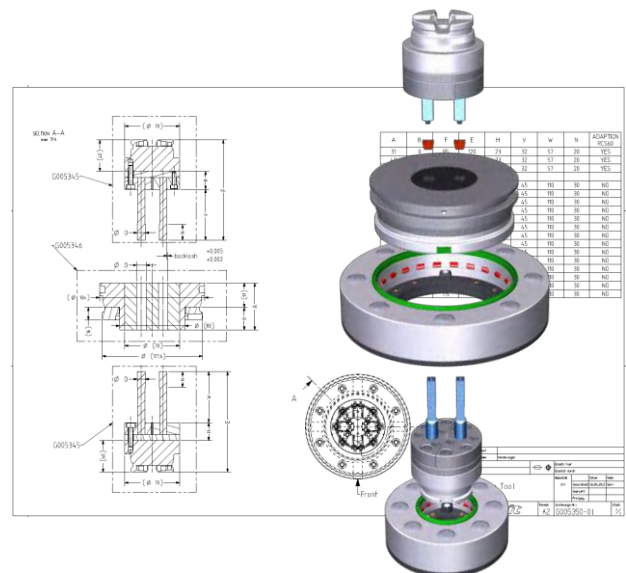
Concept, Design and Production of Complex and High Precise Compaction Tools

The concept, design and production of complex and high precise compaction tools was adapted on the base of the long time know how of ProGrit in the field compaction of metal and ceramic powder to the usage of reference clamping systems.

ProGrit supplies for complex product geometries in the field of

- Multi cavities tools
- Co axial compaction – splitted punch
- Multi axial compaction – cross hole, closed, opened and splitted die

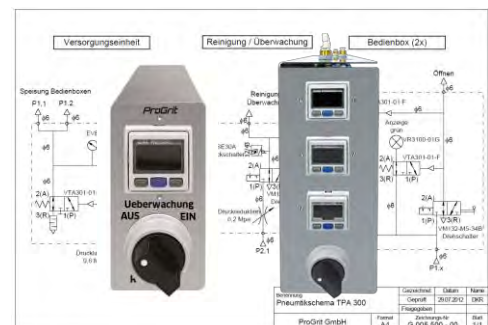
the complete tool technology as well as the production of the compaction tools.



Pneumatic Support and Supervision of Reference Clamping Systems

The pneumatic support and supervision of reference clamping systems is done by control boxes and air supply units which are installed in the press.

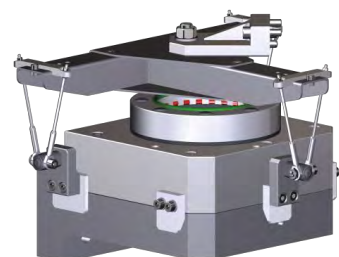
Due to safety aspects the reference clamping systems are supervised regarding their operation behaviour and status during the compaction process.



Handling

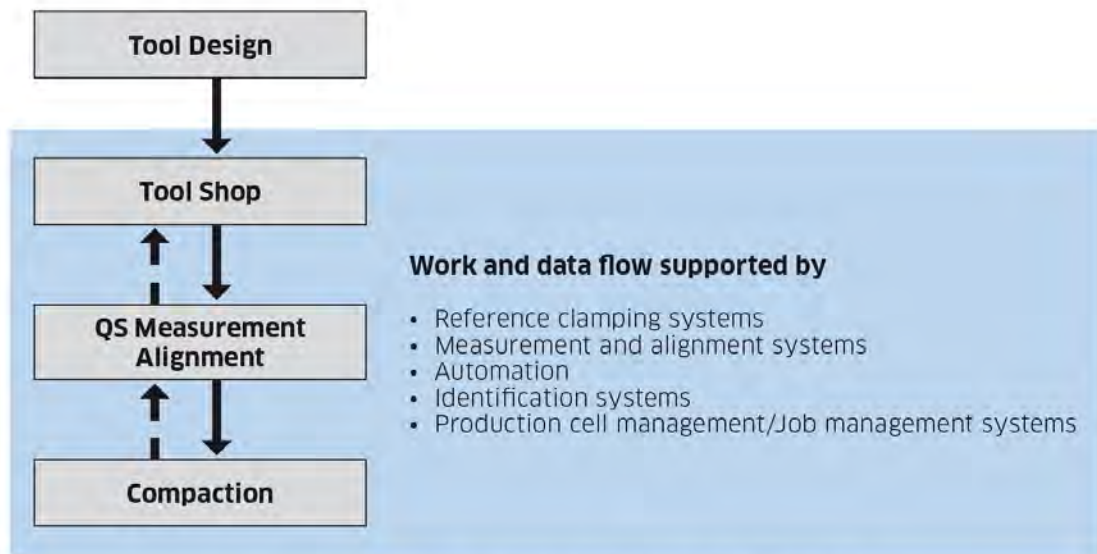
Applications for compaction forces over 100 tons leading to compaction tools and changeable parts of the press or the die set in the range of more than 50 kilograms.

ProGrit develops and supplies gripper and handling solutions for those parts.



RFID / Work and Data Flow / Technology Chain

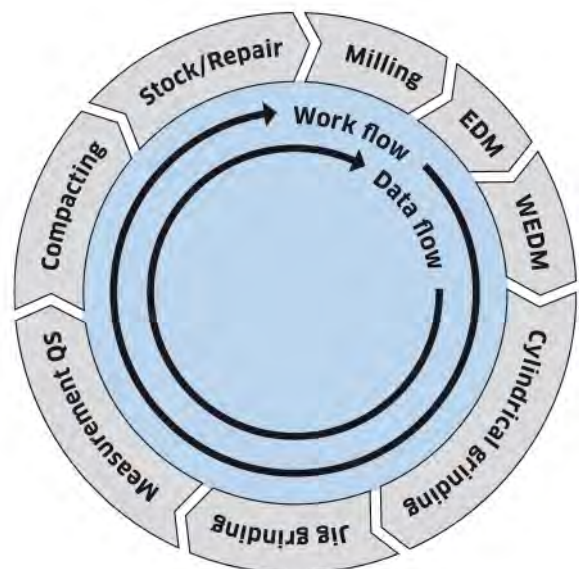
The continuous production of compaction tools on pallets places high demands on an optimal work and data flow from the tool shop up to the usage of the compaction tools in the press. Shortest set up times of machine tools combined with highest manufacturing precision reduces the tool manufacturing costs.



Technology chain – Powder Compaction Tooling

The Powder Compacting Tooling system guarantees the consistence of the interfaces from the tool shop up to the press. Work flow and data flow are supported and optimized by reference clamping systems, RFID based identification systems and adapted measurement technologies.

The implementation of a Powder Compacting Tooling system results in a closed technology chain - from tool design to the tool shop over the quality assurance up to the press.



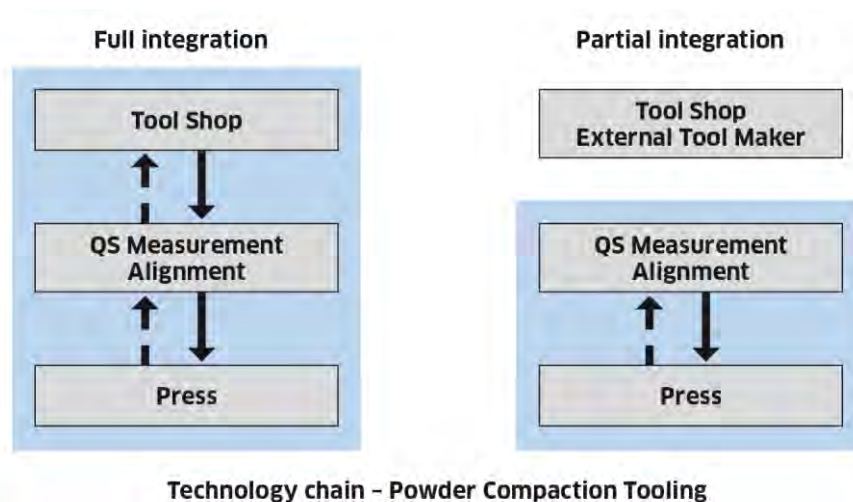
Adaptation and Equipment of Tool Shop for Full or Partial Integration

The Powder Compaction Tooling System works in the press with palletized and referenced compaction tools.

In the continuity of the manufacture and usage of compaction tools it can be distinguished between:

- **Full integration**
All machines of the tool shop are equipped on the machine table side with the Powder Compaction Tooling.
- **Partial integration**
The tool shop still manufactures compaction tools conventionally and is therefore not equipped with the Powder Compaction Tooling System. The compaction tools are connected with the pallets and positioned on the pallets in the quality assurance department by using the coordinate measuring machine and the palletization alignment system PAS 3i.

Full Integration and Partial Integration of Work and Data Flow

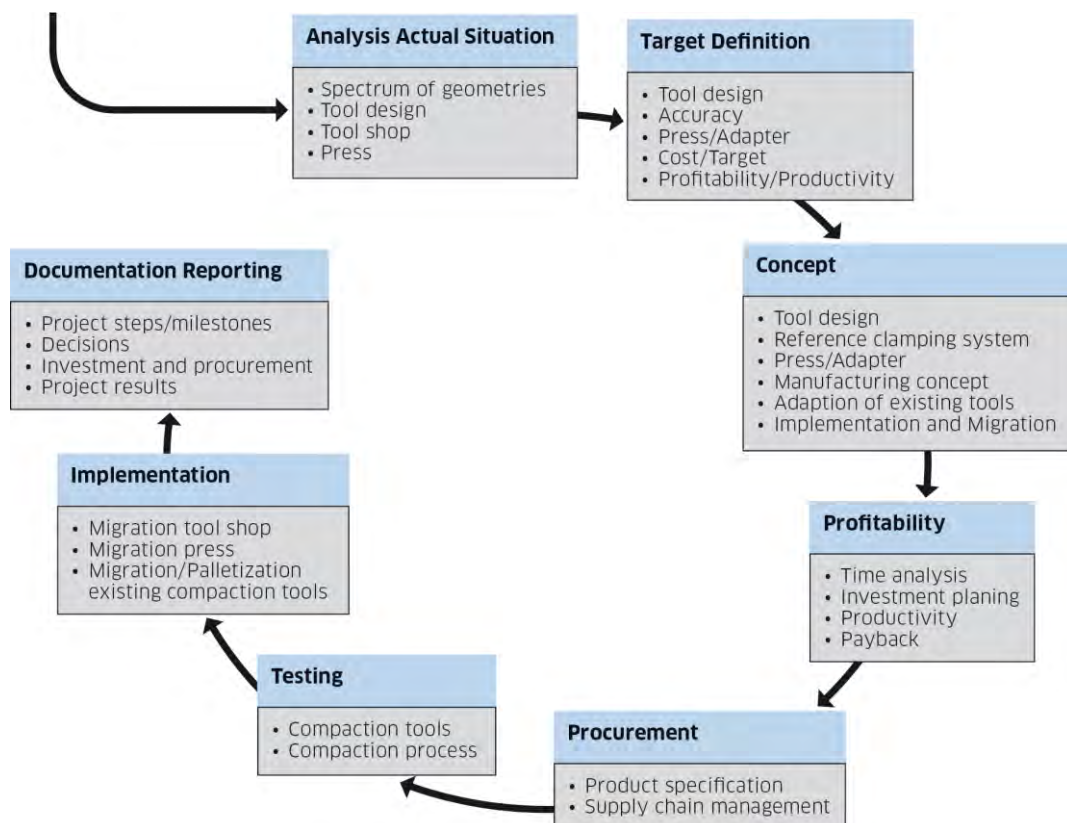


The Powder Compaction Tooling system can be operated as a full and a partial integrated system between the departments tool shop, press and quality assurance.

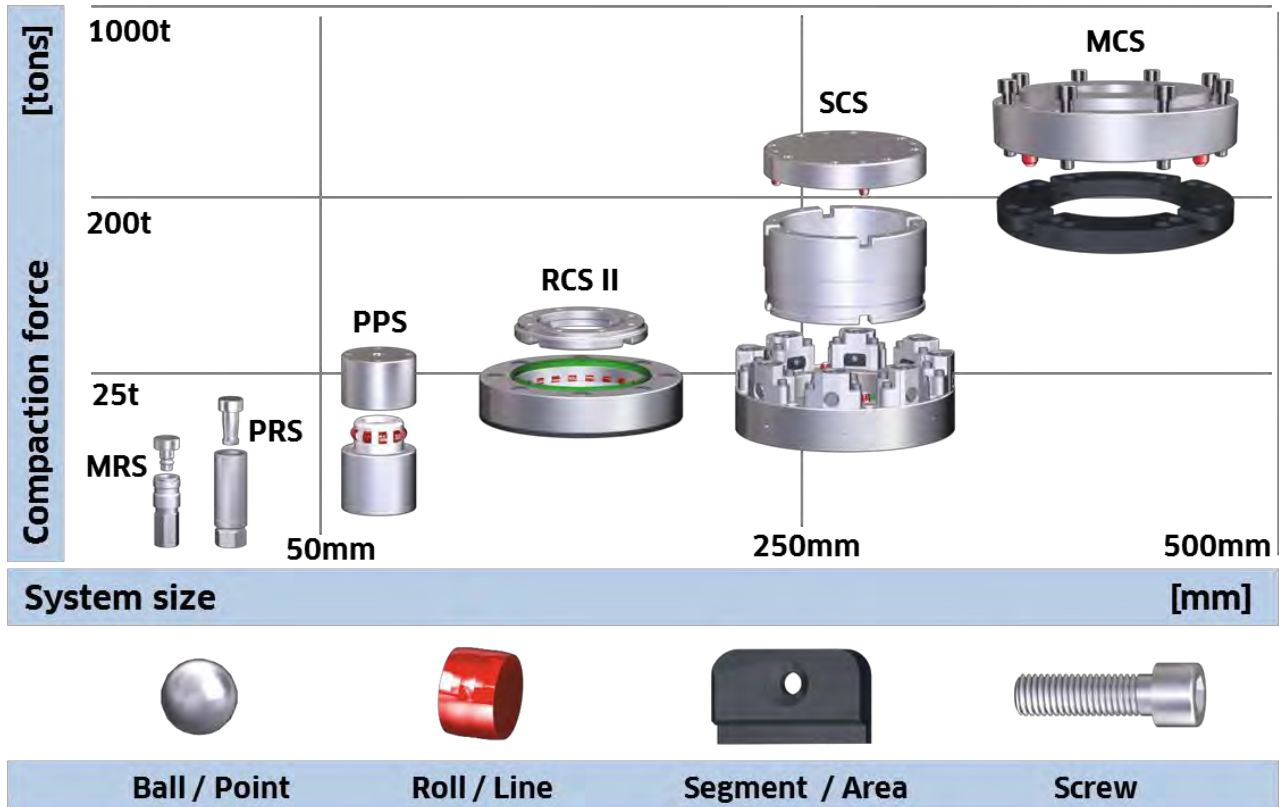
Integral 8 Step Powder Compaction Tooling System Approach

- Implementation of system analysis and evaluations in the area of compaction of metal and ceramic powder with reference clamping systems
- Implementation of cost-effectiveness, quality and precision improvement programs
- Support for problem analysis and troubleshooting

The integral 8 step Powder Compaction Tooling system approach by ProGrit is the turnkey for a complete system solution which fulfils the high demands on quality and productivity.



Reference Clamping Systems for Compaction Processes up to 1000 tons



Depending on the compaction forces the operating principle of the reference chuck will be adapted. The clamping element for the transmission of the clamping and extraction forces changes with increasing compaction forces from ball, roll to segments and screws.

MRS Manual Core Rod Clamping System		Pages 15 - 20
Positioning system	Centering X and Y, positioning Z Positioning system optional	
Precision class	>PK III	
Clamping	Spring force	
Opening	Manual	
Diameter pallet	18 - 26 mm	
Clamping force	Locking	
Max. allowed pressure	30 - 50 kN	
Max. allowed tension	3 - 5 kN	

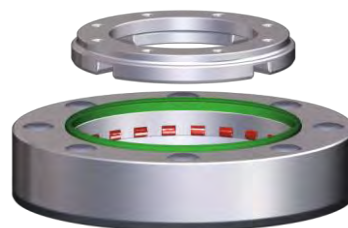
PRS Core Rod Clamping System		Pages 21 - 27
Positioning system	Centering X and Y, positioning Z Positioning system optional	
Precision class	>PK III	
Clamping	Spring force	
Opening	Pneumatic or manual	
Diameter pallet	18 - 27 mm	
Clamping force	Locking	
Max. allowed pressure	50 kN	
Max. allowed tension	25 kN	

PPS Pneumatic Core Rod and Punch Clamping System**Pages 28 - 32**

Positioning system	Centering X and Y, positioning Z Prism Power P optional
Precision class	> PK III, PK I positioned
Clamping	Spring force
Opening	Pneumatic
Diameter pallet	40 - 95 mm
Clamping force	2 500 - 13 000 N
Max. allowed pressure	250 - 500 kN
Max. allowed tension	50 - 70 kN

**RCS II Punch and Die Clamping System****Pages 33 - 56**

Positioning system	Prism Power P
Precision class	PK I
Clamping	Spring force
Opening	Pneumatic
Diameter pallet	60 - 230 mm
Clamping force	12 000 - 70 000 N
Max. allowed pressure	350 - 5 750 kN
Max. allowed tension	60 - 400 kN

**MCS Manual Punch and Die Clamping System****Pages 57 - 70**

Positioning system	Cone SCS K
Precision class	PK I-II
Clamping	Manual, bayonet ring / screw
Opening	Manual, bayonet ring / screw
Diameter pallet	105 - 500 mm
Clamping force	120 - 4 000 kN
Max. allowed pressure	1 400 - 54 000 kN
Max. allowed tension	60 - 1 750 kN

**Removable Plate System MCS C****Pages 71 - 77**

Positioning system	Cone SCS K
Precision class	PK I-II
Clamping	Manual and/or pneumatic
Opening	Manual and/or pneumatic
Clamping force	- kN
Max. allowed pressure	- kN
Max. allowed tension	- kN

**SCS Segmented Punch and Die Clamping System****Pages 78 - 82**

Positioning system	Cone SCS K
Precision class	PK I-II
Clamping	Spring force
Opening	Pneumatic
Diameter pallet	100 - 400 mm
Clamping force	2 500 - 10 000 N
Max. allowed pressure	700 - 7 000 kN
Max. allowed tension	120 - 480 kN

**SCS K Cone Positioning System****Page 83**

Positioning system	Cone SCS K
Precision class	PK I-II



MRS Manual Core Rod Clamping System



Manual reference clamping system for clamping of core rods

Modular design

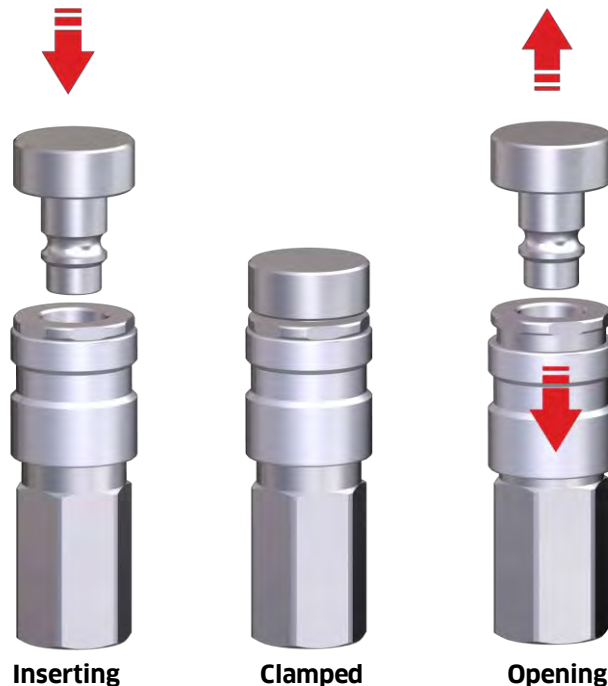
Adaptation to different core rod geometries and compressive and tensile forces is possible.

Scaling

Clamping system sizes can be combined with the smallest reference clamping system for RCS for punches. Different pallet sizes cover the requirements of compaction tools and the compaction process.

Operating

The palette is inserted with light pressure in the chuck and locked by an automatic mechanism. The opening of the chuck is done by the operation of opening ring in vertical direction.

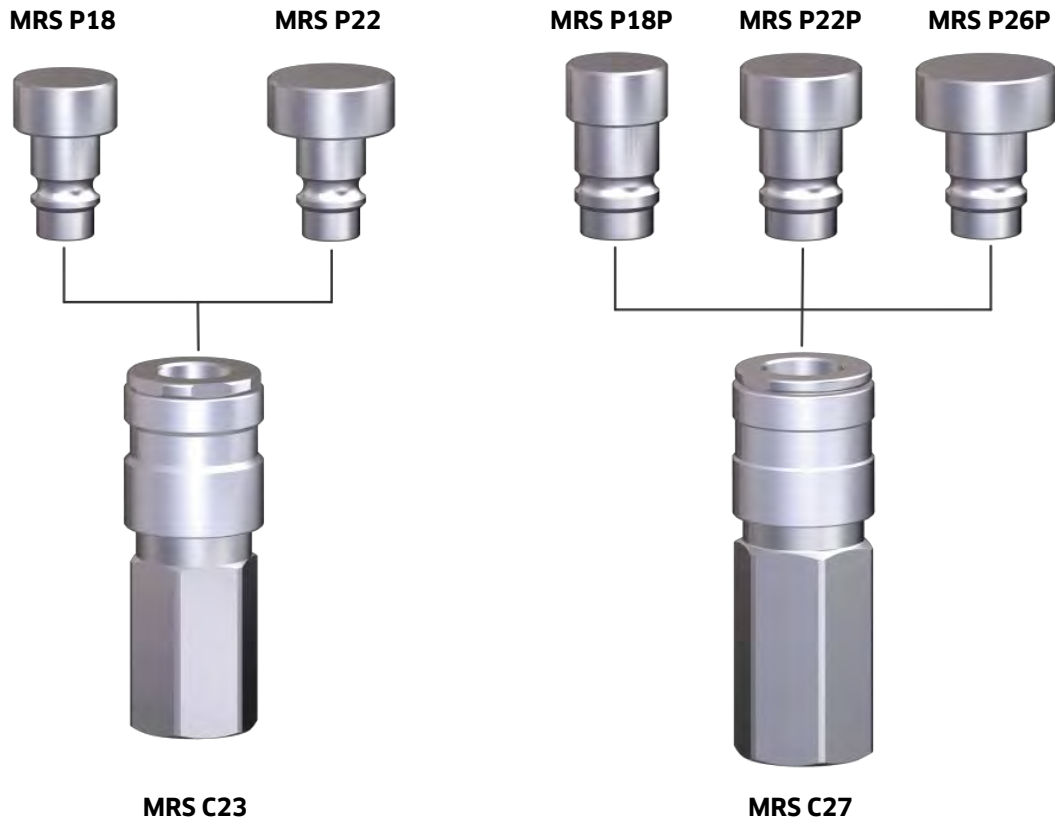


Technical Data

Positioning system	Centering X and Y, positioning Z Positioning system optional
Repeatability X/Y	+/- 0,020 mm (3 σ value) +/- 0,005 mm (3 σ value) optional
Repeatability Z	+/- 0,002 mm (3 σ value)
Indexing	4 x 90° optional
Clamping	Spring force
Opening	Manual
Clamping force	Locking
Max. allowed pressure	30 - 50 kN
Max. allowed tension	3 - 5 kN



Pallets in various sizes can be clamped in the two core rod clamping systems MRS C23 and MRS C27.



Through hole diameter of smallest punch clamping systems:

- ProGrit RCS II 60 = 28,5 mm
- EROWA PM 56/60 = 25 mm
- System 3R° Macro° 90803.50 und 90804.41 = 23 mm (Draw bar 16 mm)
- System 3R° Macro° 600.17 und 600.27 = 20 mm (Draw bar 10,2 mm)

There are different pallet types and techniques available for the fixing of the core rod with the palette:

**Soldering, gluing, screwing
of core rod in standard pallets
MRS Px and MRS PxP**



**Clamping of smooth core rod
by collet
MRS P ER and MRS PP ER**



**Clamping of smooth core rod
by clamping set
MRS SP und MRS PP SP**



**Clamping of smooth core rod
by radial screw**



**Floating fixation
of core rod**



Pallets are available in various sizes and types on request.

Manual Core Rod Chuck MRS C



INOX

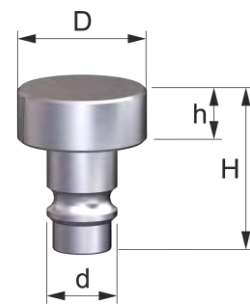


Material	Steel stainless
Positioning system	Centering X and Y Positioning Z Positioning system optional
Clamping force	Locking
Max. allowed pressure	30 - 50 kN
Max. allowed tension	3 - 5 kN
Air connection	None
Operation	Manual
Mechanical fixing	Screwed on piston rod
Application	Press and machine tools for locking of core rod pallets



Chuck	MRS C23	MRS C27
Product number	P-002 700	P-002 730
d	12 mm	15 mm
D	23 mm	27 mm
H	60 mm	75 mm
Clamping force	Locking	Locking
Max. allowed pressure	30 kN	50 kN
Max. allowed tension	3 kN	5 kN
Mechanical fixing	M12 x 1	M16 x 1
Weight	0,2 kg	0,3 kg

Pallet MRS P



Material	Steel stainless
Positioning system	Centering X and Y, positioning Z Positioning system optional
Chuck	MRS C23 and MRS C27
Mechanical fixing	Soldering, gluing, screwing
Pitch circle	None
Application	Press and machine tools for fixing of core rods

Pallet	MRS P18	MRS P22	MRS P18P	MRS P22P	MRS P26P
Product number	P-001 312	P-001 310	P-002 739	P-002 738	P-002 737
Chuck	MRS C23	MRS C23	MRS C27	MRS C27	MRS C27
d	12 mm	12 mm	15 mm	15 mm	15 mm
D	18 mm	22 mm	18 mm	22 mm	26 mm
h*	9 mm	9 mm	10 mm	10 mm	10 mm
H	28 mm	28 mm	31 mm	31 mm	31 mm
Max. allowed pressure	30 kN	30 kN	50 kN	50 kN	50 kN
Weight	0,05 kg	0,06 kg	0,06 kg	0,07 kg	0,08 kg

*Height h can be extended.

Pallet MRS P ER and MRS P P ER with Collet for Smooth Core Rods



Material	Steel stainless
Positioning system	Centering X and Y, positioning Z Positioning system optional
Chuck	MRS C23 and MRS C27
Mechanical fixing	Collet
Application	Press and machine tools for fixing of core rods

Pallet	MRS P ER11	MRS P ER16	MRS P ER11 P	MRS P ER16 P	MRS P ER20 P
Product number	P-006 440	P-006 435	P-006 450	P-006 451	P-006 452
Chuck	MRS C23	MRS C23	MRS C27	MRS C27	MRS C27
d	12 mm	12 mm	15 mm	15 mm	15 mm
dc	1-7 mm	1-10 mm	1-7 mm	1-10 mm	1-13 mm
Clamping range	0,5 mm	1 mm	0,5 mm	1 mm	1 mm
D / ERM	16 mm / 11	22 mm / 16	16 mm / 11	22 mm / 16	27 mm / 20
h*	17 mm	38,5 mm	17 mm	38,5 mm	46,5 mm
H	36 mm	57,5 mm	36 mm	57,5 mm	65,5 mm
Max. allowed pressure	30 kN	30 kN	50 kN	50 kN	50 kN
Max. allowed tension	- kN	- kN	- kN	- kN	- kN
Weight	0,05 kg	0,06 kg	0,05 kg	0,06 kg	0,06 kg

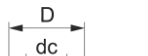
*Height h can be extended. Specify clamping diameter dc for order. Delivery inclusive collet und clamping nut.

Clamping nut	ERM 11	ERM 16	ERM 20	
Product number	P-002 747	P-002 752	P-002 757	
D / ERM	16 mm / 11	22 mm / 16	27 mm / 20	
Max. allowed tension	- kN	- kN	- kN	
Weight	0,05 kg	0,05 kg	0,05 kg	

Collet	Clamping diameter dc	Product number	
ER 11	0,5 - 7 mm Clamping range 0,5 mm	P-006 441 + dc	
ER 16	0,5 - 10 mm Clamping range 1 mm	P-006 442 + dc	
ER 20	0,5 - 13 mm Clamping range 1 mm	P-006 443 + dc	

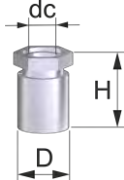
Specify clamping diameter dc for order.

Pallet MRS P SP and MRS P P SP with Clamping Set for Smooth Core Rods

			
Material	Steel		
Positioning system	Centering X and Y, positioning Z Positioning system optional		
Chuck	MRS C23 and MRS C27		
Mechanical fixing	Clamping set		
Application	Press and machine tools for fixing of core rods		

Pallet	MRS P SP, Clamping diameter dc 4/5/6/7/8/9/10/11/12	MRS P P SP, Clamping diameter dc 4/5/6/7/8/9/10/11/12/14/15
Product number	P-006 460 + dc	P-006 466 + dc
Chuck	MRS C23	MRS C27
d	10 mm	13 mm
dc	4/5/6/7/8/9/10/11/12 mm	4/5/6/7/8/9/10/11/12/14/15 mm
D	18 - 22 mm	18 - 27 mm
h*	22 / 29 mm	22 / 29 mm
H	41 / 48 mm	61 / 68 mm
Max. allowed pressure	30 kN	50 kN
Max. allowed tension	- kN	- kN
Weight	0,05 kg	0,06 kg

*Height h can be extended. Specify clamping diameter dc for order. Delivery inclusive clamping set.

Clamping set	Clamping diameter dc 4/5/6/7/8/9/10/11/12/14/15	
Product number	P-004 670 + dc	
dc	4/5/6/7/8/9/10/11/12/14/15 mm	
D	8 - 20 mm	
H	15 - 28 mm	
Max. allowed tension	- kN	
Weight	0,05 kg	

Specify clamping diameter dc for order.

Spacer Shaft MRS to MRS Sprung and Unsprung



INOX



Chuck MRS manual

Material	Steel stainless
Positioning system	Centering X and Y Positioning Z Positioning system optional
Operation	Manual

Adaption basis chuck MRS manual

Material	Steel stainless
Positioning system	Centering X and Y Positioning Z Positioning system optional
Clamping on basis	A) Piston rod with MRS pallet profil B) Piston rod with MRS chuck
Application	Adaptation and compensation of filling heights, punch lengths and system sizes. Sprung type for compensation of compaction problems.

Type A
sprung



Type B
sprung



Spacer shaft Type A	MRS C23 / MRS C23 unsprung	MRS C23 / MRS C23 sprung	MRS C27 / MRS C27 unsprung	MRS C27 / MRS C27 sprung
Product number	P-001 303	P-001 324	P-000 000	P-000 000
Spring stroke	0 mm	2 mm	0 mm	2 mm
D	23 mm	23 mm	27 mm	27 mm
H*	130 mm	180 mm	- mm	- mm
Clamping force	Locking	Locking	Locking	Locking
Max. allowed pressure	30 kN	30 kN	50 kN	50 kN
Max. allowed tension	3 kN	3 kN	5 kN	5 kN
Weight	- kg	- kg	- kg	- kg

*Extended height is to specify in the order.

Spacer shaft Type B	MRS C23 / MRS P22 unsprung	MRS C23 / MRS P22 sprung	MRS C27 / MRS P26 unsprung	MRS C27 / MRS P26 sprung
Product number	P-006 431	P-006 430	P-000 000	P-000 000
Spring stroke	0 mm	2 mm	0 mm	2 mm
D	23 mm	23 mm	27 mm	27 mm
H*	103 mm	153 mm	- mm	- mm
Clamping force	Locking	Locking	Locking	Locking
Max. allowed pressure	30 kN	30 kN	50 kN	50 kN
Max. allowed tension	3 kN	3 kN	5 kN	5 kN
Weight	- kg	- kg	- kg	- kg

* Extended height is to specify in the order.

PRS Core Rod Clamping System



Reference clamping system for clamping of core rods

Modular design

Adaptation to different core rod geometries and compressive and tensile forces is possible.

Scaling

Clamping system sizes can be combined with the smallest reference clamping system for RCS for punches. Different pallet sizes cover the requirements of compaction tools and the compaction process.

Operating

Chuck will be opened by compressed air and afterwards the pallet can be inserted. After unpressurizing the chuck the pallet will be clamped by a spring activated clamping mechanism. To unclamp the pallet the chuck must be open by compressed air again.



Inserting

Clamped

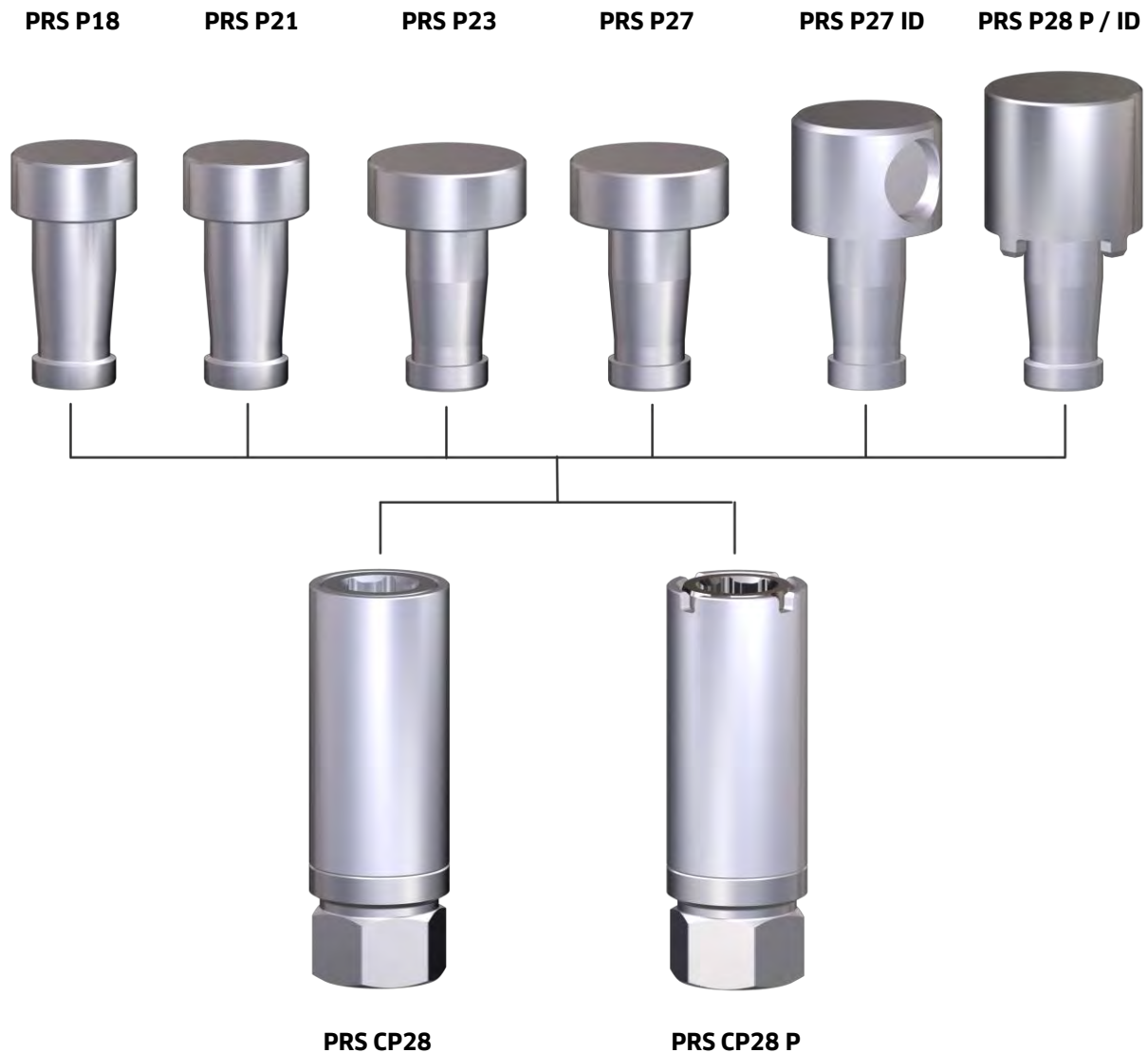
Opening

Technical Data

Positioning system	Centering X and Y, positioning Z Positioning system optional
Repeatability X/Y	+/- 0,020 mm centered (3 σ value) +/- 0,005 mm positioned (3 σ value)
Repeatability Z	+/- 0,002 mm (3 σ value) Exception floating type of chuck
Indexing	4 x 90° optional
Clamping	Spring force
Opening	Compressed air 10 bar
Clamping force	Locking
Max. allowed pressure	50 kN
Max. allowed tension	25 kN



Pallets in various sizes can be clamped in the core rod chuck PRS CP28 and PRS CP28 P.



Through hole diameter of smallest punch clamping systems:

- ProGrit RCS II 60 = 28,5 mm
- EROWA PM 56/60 = 25 mm
- System 3R° Macro° 90803.50 und 90804.41 = 23 mm (Draw bar 16 mm)
- System 3R° Macro° 600.17 und 600.27 = 20 mm (Draw bar 10,2 mm)

Pallets are available in three different types:

- **Centered clamping:**
Pallet is centered in X and Y and clamped in Z and in angle C in the chuck.
(PRS P18, PRS P21, PRS P23, PRS P27, PRS P27ID)
- **Floated clamping:**
Pallet is only locked in the axial direction Z. Rotation around C and small movements in radial direction X and Y are possible. Pallets are labelled with a F behind the product name.
(PRS P18F, PRS P21F, PRS P23F, PRS P27F, PRS P27F ID)
- **Positioned clamping:**
Pallet is referenced clamped in the directions of X, Y, Z und C by a positioning system.
(PRS P28P, PRS P28P ID)

There are different pallet types and techniques for the fixing of the core rod to the pallet available:

**Soldering, gluing, screwing
of core rod in standard pallets
PRS Px**



**Clamping of smooth core rod
by collet
PRS P ER**



**Clamping of smooth core rod
by clamping set
PRS P SP**



**Clamping of smooth core rod
by radial screw**



**Floating fixation
of core rod**



Pallets are available in various sizes and types on request.

Core Rod Chuck PRS CP Pneumatic



Material	Steel hardened stainless
Positioning system	Centering X and Y, positioning Z Positioning system P optional
Clamping force	Locking
Max. allowed pressure	50 kN
Max. allowed tension	25 kN
Air connection	Opening 10 bar Cleaning and supervising for type CL with 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed on piston rod
Application	Press and machine tools for locking of core rod pallets



Chuck	PRS CP28	PRS CP28P Positioning	PRS CP28 CL Cleaning and supervising	PRS CP28 CL P Cleaning and super- vising, positioning
Product number	P-002 745	P-006 416	P-002 795	P-006 405
d	14 mm	14 mm	14 mm	14 mm
D	28 mm	28 mm	28 mm	28 mm
H	80 mm	80 mm	80 mm	80 mm
Clamping force	Locking	Locking	Locking	Locking
Max. allowed pressure	50 kN	50 kN	50 kN	50 kN
Max. allowed tension	25 kN	25 kN	25 kN	25 kN
Mechanical fixing	M16 x 1	M16 x 1	M16 x 1	M16 x 1
Weight	0,25 kg	0,25 kg	0,25 kg	0,25 kg

Pallet PRS P Clamped Centered or Floated



Material	Steel stainless
Positioning system	Centering X and Y or floating Positioning Z
Chuck	PRS C28, PRS C28 CL PRS C28 P, PRS C28 CL P PRS CM 28, PRS CM 28 P
Mechanical fixing	Soldering, gluing, screwing
Application	Press and machine tools for fixing of core rods



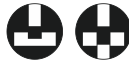
Pallet clamped	PRS P18	PRS P21	PRS P23	PRS P27	PRS P27 ID
Product number	P-002 767	P-002 768	P-002 769	P-002 770	P-006 208
Pallet floating	PRS P18F	PRS P21F	PRS P23F	PRS P27F	PRS P27F ID
Product number	P-002 772	P-002 773	P-002 774	P-002 775	P-000 000
d	14 mm	14 mm	14 mm	14 mm	14 mm
D	18 mm	21 mm	23 mm	27 mm	27 mm
h*	10 mm	10 mm	10 mm	10 mm	20 mm
H	39 mm	39 mm	39 mm	39 mm	49 mm
Max. allowed pressure	50 kN	50 kN	50 kN	50 kN	50 kN
Max. allowed tension	25 kN	25 kN	25 kN	25 kN	25 kN
Weight	0,05 kg	0,06 kg	0,06 kg	0,07 kg	0,1 kg

*Height h can be extended. ID type prepared for ID chip usage.

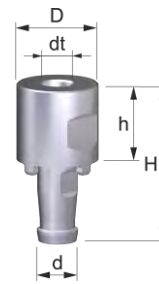
Pallet PRS P P with Positioning System



auto



Material	Steel hardened stainless
Positioning system	Positioning X, Y, Z and C
Chuck	PRS C28 P, PRS C28 CL P PRS CM 28 P
Mechanical fixing	Gluing, screwing, collet, clamping set
Application	Press and machine tools for fixing of core rods



Pallet	PRS P28 P	PRS P28 P ID
Product number	P-006 410	P-006 250
d	14 mm	14 mm
dt	M10	M10
D	28 mm	28 mm
h*	20 mm	20 mm
H	49 mm	49 mm
Max. allowed pressure	50 kN	50 kN
Max. allowed tension	25 kN	25 kN
Weight	0,1 kg	0,1 kg

* Height h can be extended. ID type prepared for ID chip usage.

Pallet PRS P ER with Collet for Smooth Core Rod



INOX



Material	Steel stainless
Positioning system	Centering X and Y, positioning Z
Chuck	PRS C28, PRS C28 CL PRS C28 P, PRS C28 CL P PRS CM 28, PRS CM 28 P
Mechanical fixing	Collet
Application	Press and machine tools for fixing of core rods



Pallet clamped	PRS P ER11	PRS P ER16	PRS P ER20	PRS P ER20 ID
Product number	P-002 750 + dc	P-002 755 + dc	P-002 760 + dc	P-002 765 + dc
Pallet floating	PRS P F ER11	PRS P F ER16	PRS P F ER20	PRS P F ER20 ID
Product number	P-000 000 + dc	P-000 000 + dc	P-000 000 + dc	P-000 000 + dc
d	14 mm	14 mm	14 mm	14 mm
dc	0,5-7 mm	0,5-10 mm	0,5-13 mm	0,5-13 mm
Clamping range	0,5 mm	1 mm	1 mm	1 mm
D / ERM	16 mm / 11	22 mm / 16	27 mm / 20	27 mm / 20
h*	17 mm	38,5 mm	46,5 mm	66,5 mm
H	46 mm	67,5 mm	75,5 mm	95,5 mm
Max. allowed pressure	50 kN	50 kN	50 kN	50 kN
Max. allowed tension	- kN	- kN	- kN	- kN
Weight	0,05 kg	0,06 kg	0,06 kg	0,06 kg

*Height h can be extended. Specify clamping diameter dc for order. Delivery inclusive collet und clamping nut.

Clamping nut	ERM 11	ERM 16	ERM 20
Product number	P-002 747	P-002 752	P-002 757
D / ERM	16 mm / 11	22 mm / 16	27 mm / 20
Max. allowed tension	- kN	- kN	- kN
Weight	0,05 kg	0,05 kg	0,05 kg



Collet	Clamping diameter dc	Product number
ER 11	0,5 - 7 mm Clamping range 0,5 mm	P-006 441 + dc
ER 16	0,5 - 10 mm Clamping range 1 mm	P-006 442 + dc
ER 20	0,5 - 13 mm Clamping range 1 mm	P-006 443 + dc

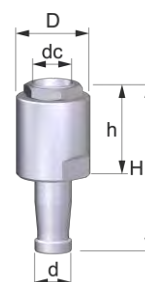


Specify clamping diameter dc for order.

Pallet PRS P SP with Clamping Set for Smooth Core Rods



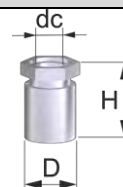
Material	Steel
Positioning system	Centering X and Y, positioning Z
Chuck	PRS C28, PRS C28 CL PRS C28 P, PRS C28 CL P PRS CM 28, PRS CM 28 P
Mechanical fixing	Clamping set
Application	Press and machine tools for fixing of core rods



Pallet clamped	PRS P SP, Clamping diameter dc 4/5/6/7/8/9/10/11/12/13/14/15	PRS P SP ID, Clamping diameter dc 4/5/6/7/8/9/10/11/12/13/14/15
Product number	P-006 456 + dc	P-006 462 + dc
Pallet floating	PRS P F, Clamping diameter dc 4/5/6/7/8/9/10/11/12/13/14/15	PRS P F ID, Clamping diameter dc 4/5/6/7/8/9/10/11/12/13/14/15
Product number	P-000 000 + dc	P-000 000 + dc
d	14 mm	14 mm
dc	4/5/6/7/8/9/10/11/12/14/15 mm	4/5/6/7/8/9/10/11/12/14/15 mm
D	18 - 27 mm	27 mm
h*	22 / 29 mm	22 / 29 mm
H	41 / 48 mm	61 / 68 mm
Max. allowed pressure	50 kN	50 kN
Max. allowed tension	- kN	- kN
Weight	0,05 kg	0,07 kg

*Height h can be extended. Specify clamping diameter dc for order. Delivery inclusive of clamping set.

Clamping set	Clamping diameter dc 4/5/6/7/8/9/10/11/12/14/15
Product number	P-004 670 + dc
dc	4/5/6/7/8/9/10/11/12/14/15 mm
D	8 - 20 mm
H	15 - 28 mm
Max. allowed tension	- kN
Weight	0,05 kg



Specify clamping diameter dc for order.

Adaptation MRS Chuck to PRS Pallet unsprung and sprung



INOX



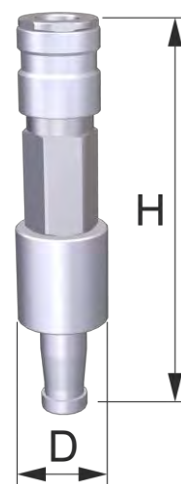
Chuck MRS manual

Material	Steel stainless
Positioning system	Centering X and Y, positioning Z Positioning system optional
Operation	Manual

Adaptation basis pallet PRS

Material	Steel stainless
Positioning system	Centering X and Y, positioning Z Positioning system optional
Clamping in chuck	PRS C28, PRS C28 CL PRS C28 P, PRS C28 CL P PRS CM 28, PRS CM 28 P
Electronic identification	RFID optional
Application	Adaptation and compensation of filling heights, punch lengths and system sizes.

unsprung



sprung



Adaptation	PRS P27 / MRS C23 unsprung	PRS P27 / MRS C23 sprung	PRS P27 / PRS CM28 unsprung	PRS P27 / PRS CM28 sprung
Product number	P-006 495	P-006 422	P-000 000	P-000 000
D	27 mm	27 mm	28 mm	28 mm
H*	80 mm	148 mm	- mm	- mm
Clamping force	Locking	Locking	Locking	Locking
Max. allowed pressure	30 kN	30 kN	50 kN	50 kN
Max. allowed tension	3 kN	3 kN	5 kN	5 kN
Weight	0,2 kg	0,35 kg	- kg	- kg

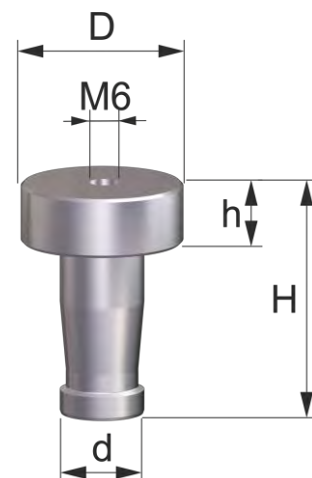
*Minimum of height. Height H must be specified for order.

Cover Pallet PRS PC



Material	Alumium
Positioning system	-
Chuck	PRS C28, PRS C28 CL PRS C28 P, PRS C28 CL P PRS CM 28, PRS CM 28 P
Mechanical fixing	M 6
Application	Press and machine tools for protection of the chuck

Pallet	PRS PC 18	PRS PC 27
Product number	P-000 000	P-002 764
d	14 mm	14 mm
D	18 mm	27 mm
h*	10 mm	10 mm
H	39 mm	39 mm
Weight	0,03 kg	0,05 kg



Manual Core Rod Clamping System PRS CM28 for Adaptations and Press Installationen without Compressed Air Supply

Core Rod Chuck PRS CM Manual

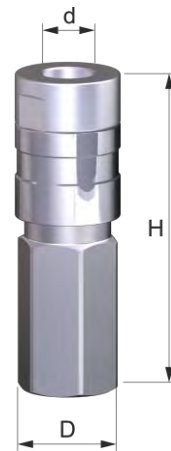


auto

INOX



Material	Steel hardened stainless
Positioning system	Centering X and Y, positioning Z Positioning system P optional
Clamping force	Locking
Max. zul. Druckkraft	50 kN
Max. zul. Zugkraft	25 kN
Air connection	None
Operation	Manual
Mechanical fixing	M16 x1, Verschraubung mit Kolbenstange
Application	Pulverpresse zur Aufnahme von Dornpalette



Chuck	PRS CM28	PRS CM28 P Positioning
Product number	P-009 210	P-009 220
d	14 mm	14 mm
D	28 mm	28 mm
H	86 mm	86 mm
Weight	0,25 kg	0,25 kg

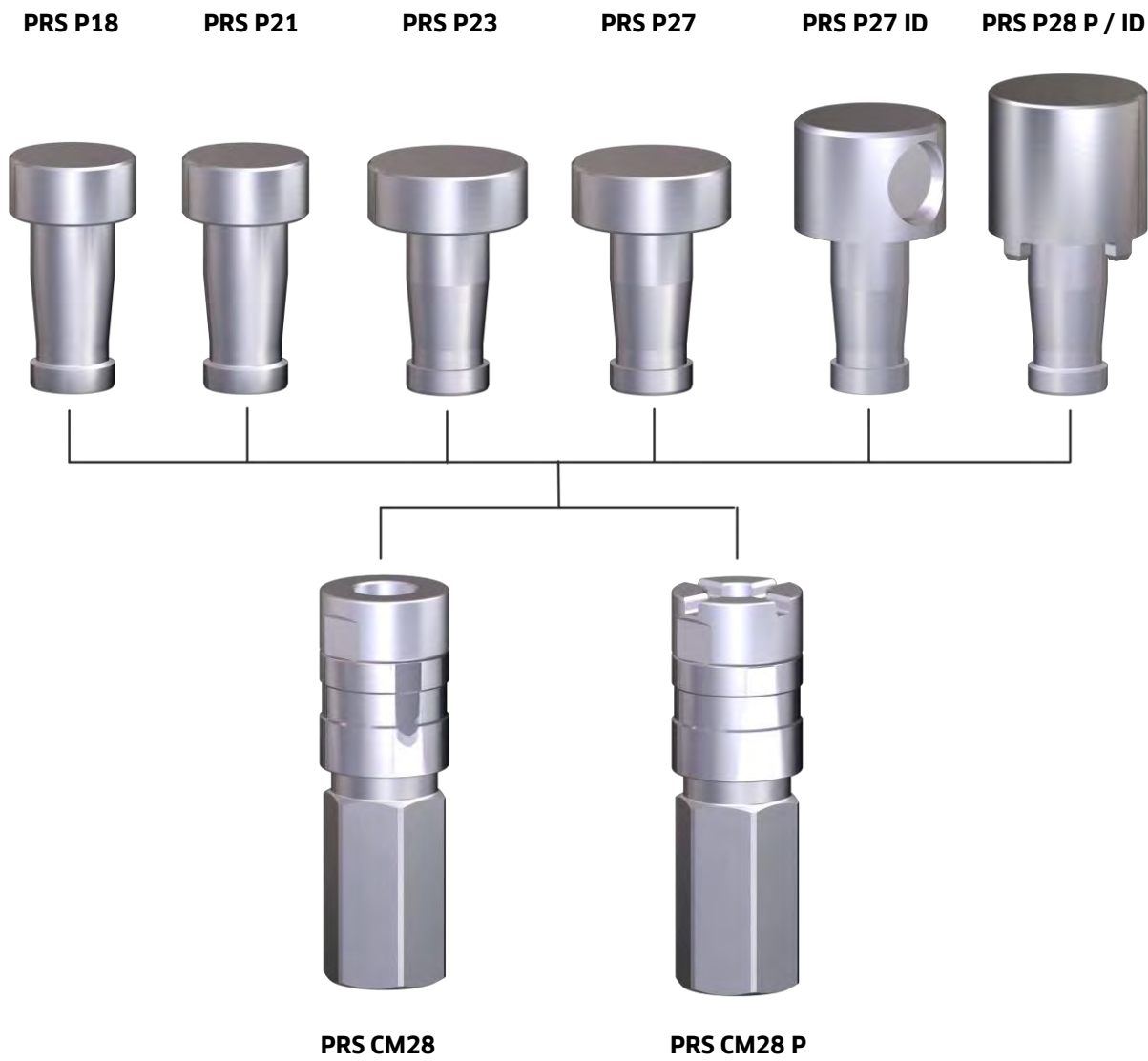
Through hole diameter of smallest punch clamping systems:

- ProGrit RCS II 60 = 28,5 mm
- EROWA PM 56/60 = 25 mm
- System 3R° Macro° 90803.50 und 90804.41 = 23 mm (Draw bar 16 mm)
- System 3R° Macro° 600.17 und 600.27 = 20 mm (Draw bar 10,2 mm)

Pallets are in following different types in PRS CM28 and PRS CM28 P clampable:

- **Centered clamping:**
Pallet is centered in X and Y and clamped in Z and in angle C in the chuck.
(PRS P18, PRS P21, PRS P23, PRS P27, PRS P27ID)
- **Positioned clamping:**
Pallet is referenced clamped in the directions of X, Y, Z und C by a positioning system.
(PRS P28P, PRS P28P ID)

Pallets in various sizes can be clamped in the core rod chuck PRS CM28 and PRS CM28 P.



PPS Pneumatic Core Rod and Punch Clamping System



Pneumatic reference clamping system for clamping of core rods and punches

Modular design

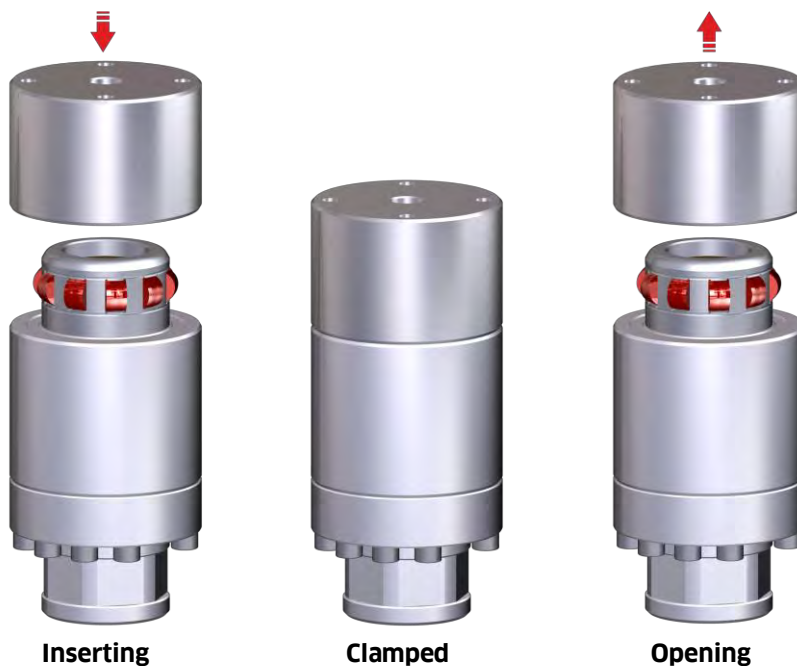
Adaptation to different core rod and punch geometries and compressive and tensile forces is possible.

Scaling

Clamping system sizes can be adapted to RCS, MCS and SCS clamping systems and cover the requirements of compaction tools and compaction processes. Usage for coaxial and multiaxial compaction.

Operating

Chuck will be opened by compressed air and afterwards the pallet can be inserted. After unpressurizing the chuck the pallet will be clamped by a spring activated clamping mechanism. To unclamp the pallet the chuck must be opened by compressed air again.

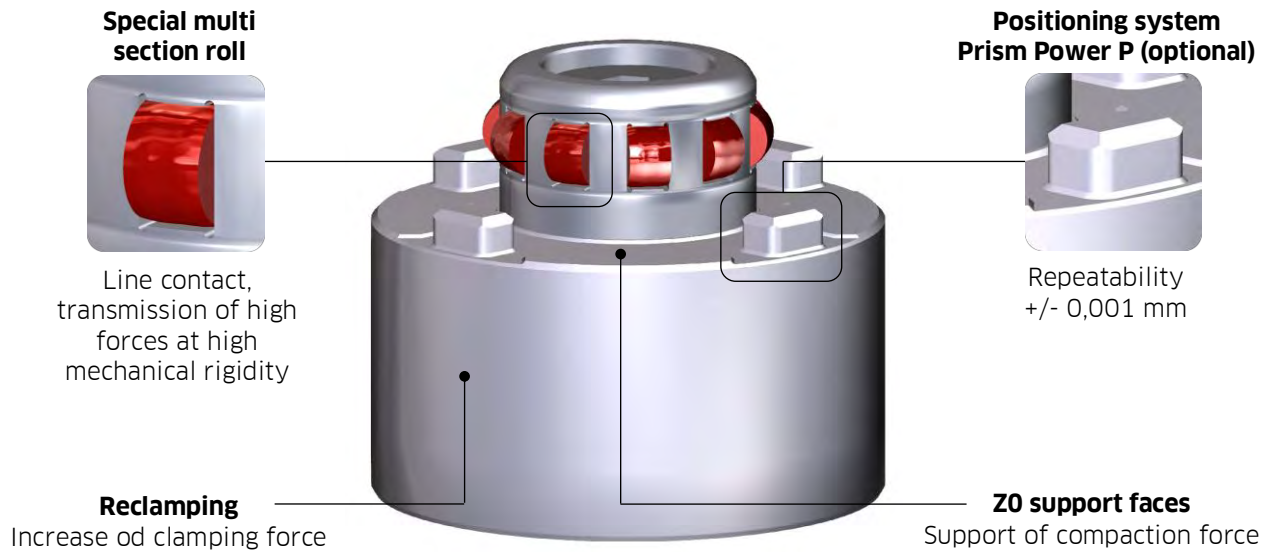


Technical Data

Positioning system	Centering X and Y, positioning Z Prism Power P optional
Repeatability X/Y	+/- 0,020 mm centered (3 σ value) +/- 0,001 mm positioned (3 σ value)
Repeatability Z	+/- 0,001 mm (3 σ value)
Indexing	4 x 90° optional
Clamping	Spring force
Reclamping	Compressed air 6 bar optional
Opening	Compressed air 10 bar
Clamping force	7 000 - 20 000 N
Max. allowed pressure	250 - 500 kN
Max. allowed tension	50 - 70 kN

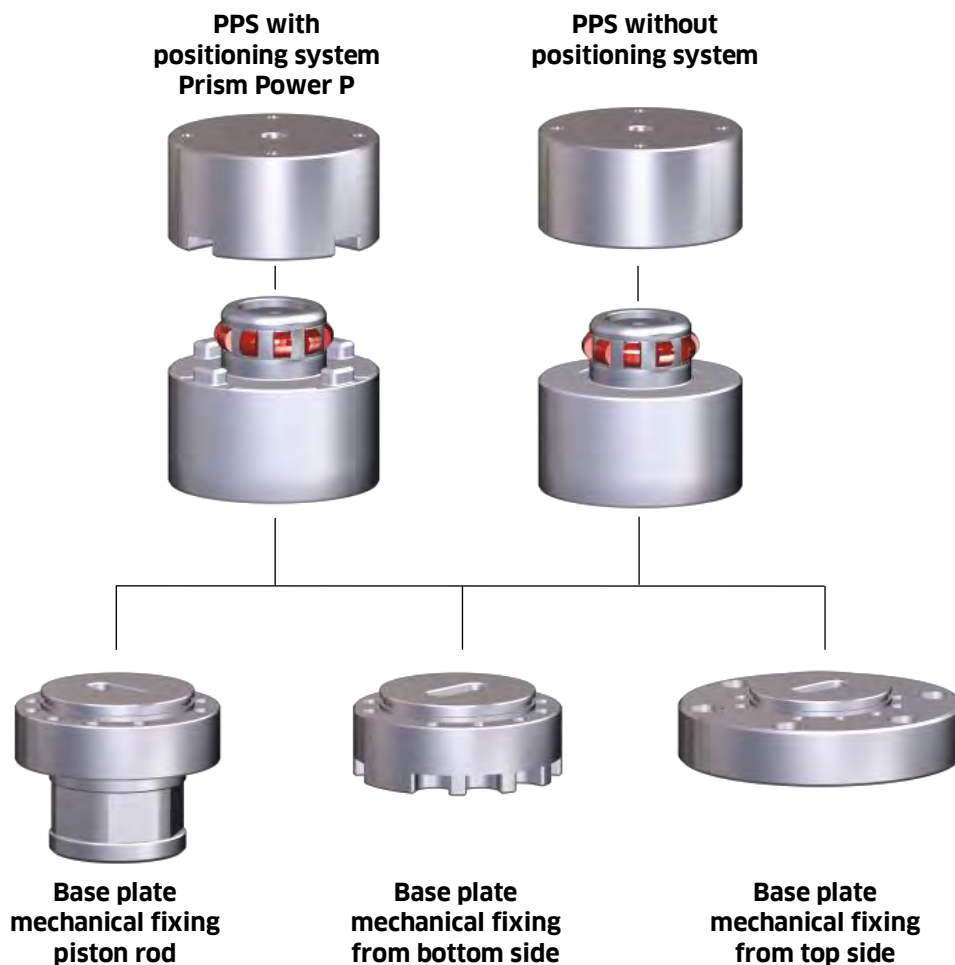


Basic Principle PPS Chuck



Types of PPS Reference Clamping Systems

- Pneumatic clamping system PPS with and without positioning system Prism Power P supports the various application cases.
- Different base plates allow the fixation to the press or the machine tool.



Pneumatic Core Rod and Punch Chuck PPS C



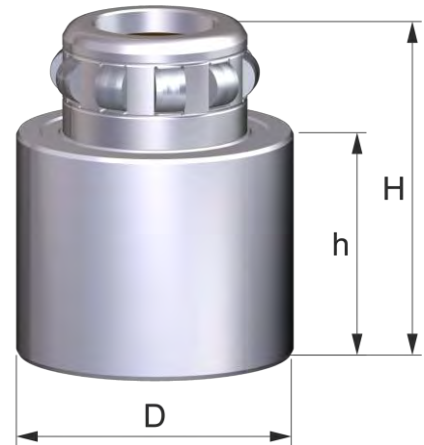
auto



INOX

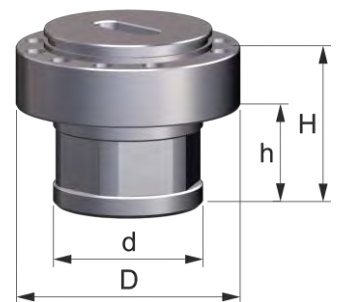


Material	Steel hardened stainless
Positioning system	Centering X and Y, positioning Z Prism Power P optional
Clamping force	7 000 - 20 000 N
Max. allowed pressure	250 - 500 kN
Max. allowed tension	50 - 70 kN
Air connection	Opening 10 bar Reclamping 6 bar optional Cleaning and supervising 1 bar optional
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed on base plate or piston rod
Application	Press and machine tools for clamping of core rod and punch pallets

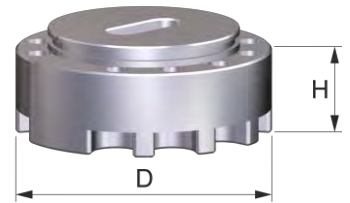


Chuck centered	PPS C40	PPS C60	PPS C80	PPS C95
Product number	P-000 000	P-001 360	P-001 370	P-006 000
Chuck positioned	PPS C40 P	PPS C60 P	PPS C80 P	PPS C95 P
Product number	P-000 000	P-006 060	P-000 000	P-000 000
D	40 mm	60 mm	80 mm	95 mm
h	45 mm	49 mm	49 mm	50 mm
H	60 mm	61 mm	61 mm	65 mm
Clamping force	3 500 N	7 000 N	9 500 N	15 000 N
Clamping force reclamped	- N	- N	20 000 N	40 000 N
Max. allowed pressure	150 kN	250 kN	500 kN	750 kN
Max. allowed tension	25 kN	50 kN	70 kN	100 kN
Mechanical fixing	8 x M5	10 x M5	6 x M6	8 x M6
Pitch circle	32 mm	52 mm	68 mm	83 mm
Weight	1,0 kg	1,3 kg	2,5 kg	3,5 kg

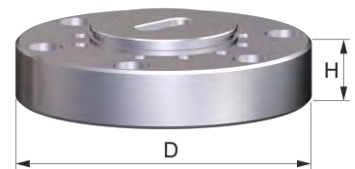
Base plate core rod	PPS C40 BPR	PPS C60 BPR	PPS C80 BPR	PPS C95 BPR
Product number	P-000 000	P-001 364	P-000 798	P-000 000
d	- mm	48 mm	48 mm	- mm
D	40 mm	60 mm	80 mm	95 mm
h	- mm	27 mm	27 mm	- mm
H	- mm	48 mm	48 mm	- mm
Max. allowed pressure	150 kN	250 kN	250 kN	350 kN
Mechanical fixing chuck	-	10 x M5	6 x M6	-
Pitch circle	- mm	52 mm	68 mm	- mm
Mechanical fixing core rod	-	M20 x 1,5	M20 x 1,5	-
Air connections	Opening and reclamping from the bottom through the base plate or piston rod			
Weight	0,8 kg	0,9 kg	1 kg	1,2 kg



Base plate, fixing from bottom side	PPS C40 BPB	PPS C60 BPB	PPS C80 BPB	PPS C95 BPB
Product number	P-000 000	P-000 788	P-001 354	P-006 029
D	40 mm	60 mm	80 mm	95 mm
H	20 mm	20 mm	20 mm	20 mm
Max. allowed pressure	150 kN	300 kN	500 kN	750 kN
Mechanical fixing chuck	8 x M5	10 x M5	6 x M6	8 x M6
Pitch circle	32 mm	52 mm	68 mm	83 mm
Mechanical fixing base plate	-	2 x M10	4 x M8	4 x M10
Pitch circle	- mm	40 mm	40 mm	74 mm
Air connection	Opening and reclamping from bottom side or from side through base plate			
Weight	0,5 kg	0,6 kg	0,7 kg	0,9 kg



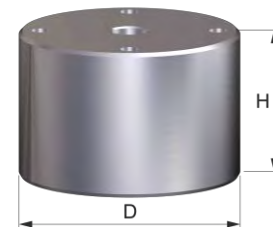
Base plate, fixing from top side	PPS C40 BPT	PPS C60 BPT	PPS C80 BPT	PPS C95 BPT
Product number	P-000 000	P-001 386	P-001 354	P-006 029
D	66 mm	88 mm	110 mm	95 mm
H	20 mm	20 mm	20 mm	20 mm
Max. allowed pressure	150 kN	300 kN	500 kN	750 kN
Mechanical fixing chuck	8 x M5	10 x M5	6 x M6	8 x M6
Pitch circle	32 mm	52 mm	68 mm	83 mm
Mechanical fixing base plate	6 x M6	6 x M6	6 x M6	
Pitch circle	- mm	75 mm	95 mm	- mm
Air connections	Opening and reclamping from bottom side through base plate			
Weight	0,3 kg	0,4 kg	0,5 kg	0,7 kg



Pallet Core Rod and Punch System PPS P



Material	Steel hardened stainless
Positioning system	Prism Power P optional
Chuck	PPS C
Mechanical fixing	Thread holes
Application	Press and machine tools for fixing of core rods and punches



Pallet centered	PPS P40	PPS P60	PPS P80	PPS P95
Product number	P-000 000	P-001 361	P-001 351	P-006 001
Pallet positioned	PPS P40 P	PPS P60 P	PPS P80 P	PPS P95 P
Product number	P-000 000	P-006 061	P-000 799	P-000 000
D	40 mm	60 mm	80 mm	95 mm
H	40 mm	40 mm	40 mm	50 mm
Mechanical fixing	4 x M6	4 x M6	4 x M6	4 x M8
Pitch circle	28 mm	48 mm	65 mm	70 mm
Weight	0,5 kg	0,7 kg	1,2 kg	1,5 kg

Adaptation MRS and PRS Chuck to PPS Pallet

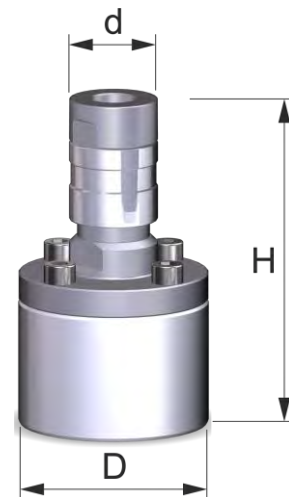


Chuck MRS C23 and PRS CM28

Material	Steel stainless
Positioning system	Centering X and Y, positioning Z Positioning system optional
Operation	Manual

Adaptation basis pallet PPS

Material	Steel hardened stainless
Positioning system	Centered X and Y, positioning Z Prism Power P optional
Clamping in chuck	PPS
Electronic identification	RFID optional
Application	Adaptation and compensation of filling heights, punch lengths and system sizes.



Adaptation	PPS P40/MRS C23	PPS P40/PRS CM28	PPS P60/MRS C23	PPS P60/PRS CM28
Product number	P-000 000	P-000 000	P-001 390	P-001 395
d	23 mm	28 mm	23 mm	28 mm
D	40 mm	40 mm	60 mm	60 mm
H*	105 mm	105 mm	105 mm	105 mm
Clamping force	Locking	Locking	Locking	Locking
Max. allowed pressure	30 kN	50 kN	30 kN	50 kN
Max. allowed tension	3 kN	5 kN	3 kN	5 kN
Weight	0,45 kg	0,5 kg	0,65 kg	0,70 kg

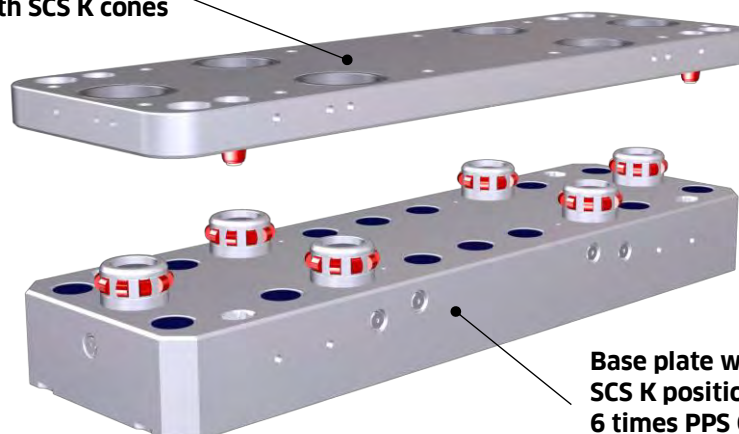
*Height H can be extended and must be specified for order.

PPS Reference Clamping System with Positioning System SCS K for Punches and Dies in any Shape

The PPS reference clamping system can be fixed in a base plate in any number and position. In combination with the positioning cones SCS K, which can also be positioned as desired, a pneumatic reference clamping system for any shapes for punches and dies can be built.

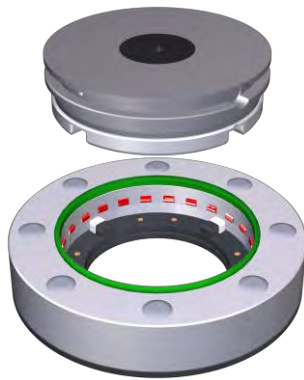
Example of a pneumatic rectangular punch clamping system based on the combination of a 6 times clamping system PPS C60 with the positioning system SCS K:

**Punch pallet
with SCS K cones**



**Base plate with
SCS K positioning grooves
6 times PPS C60 clamping system
Cleaning and supervising**

RCS II Roller Clamping System



Reference clamping system for clamping of punches and dies

The successful RCS roller clamping system has been developed to the next generation the RCS II roller clamping system. The optimized Z0 support face of the RCS II maximizes the stability against high compaction and machining forces.

Modular design

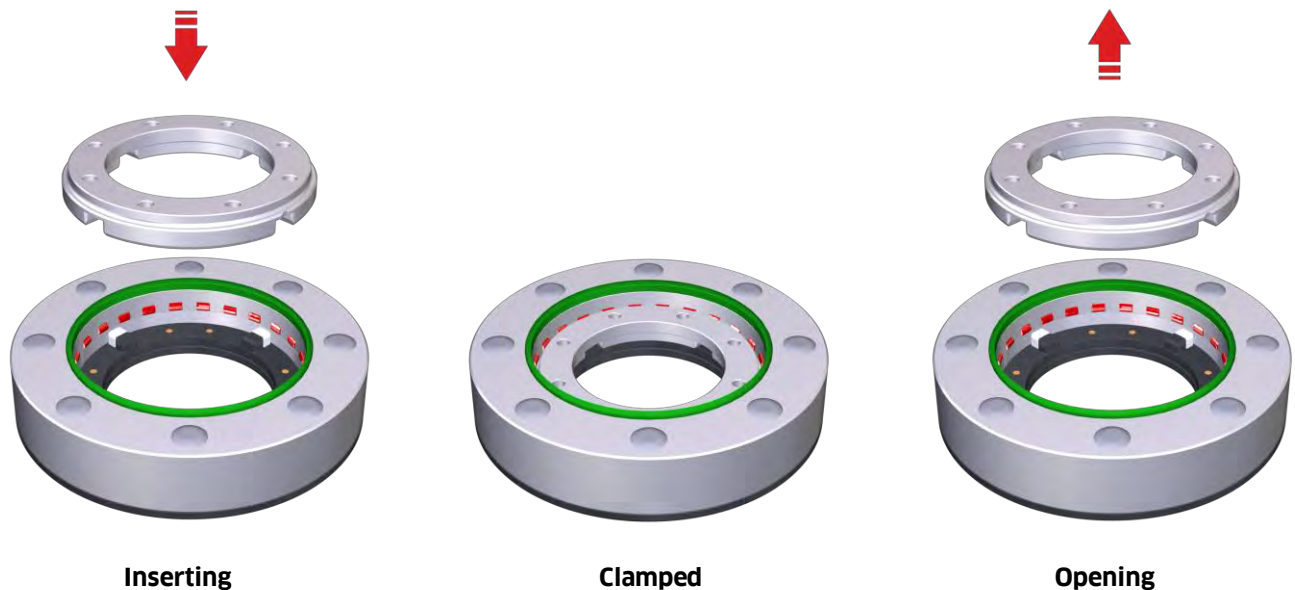
Adaptation to different punch and die geometries and compressive and tensile forces is possible

Scaling

Different sizes cover the requirements of compaction tools and the compaction process. Usage for coaxial and multiaxial compaction.

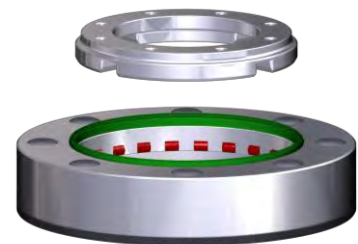
Operating

Chuck will be opened by compressed air and afterwards the pallet can be inserted. After unpressurizing the chuck the pallet will be clamped by a spring activated clamping mechanism. To unclamp the pallet the chuck must be opened by compressed air.

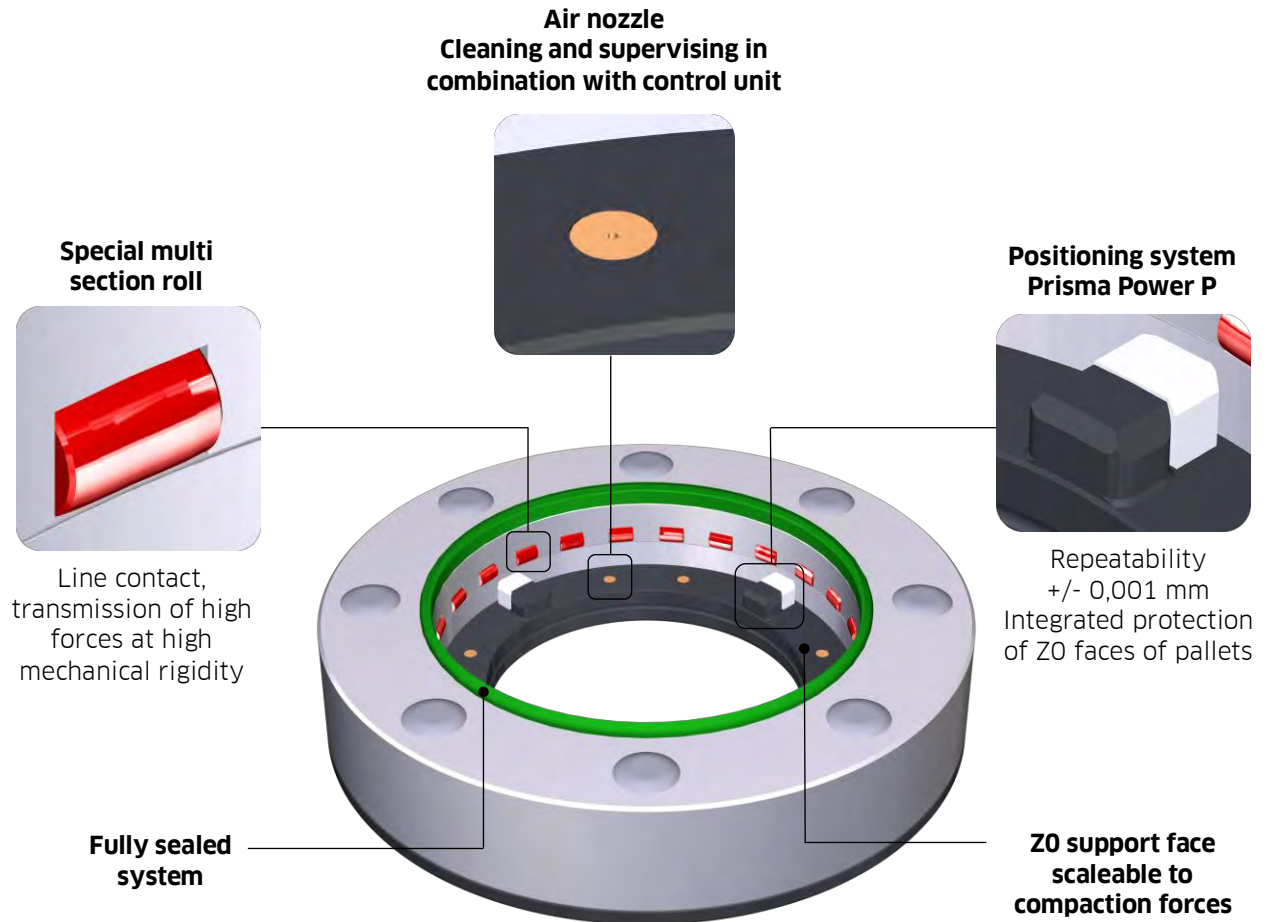


Technical Data

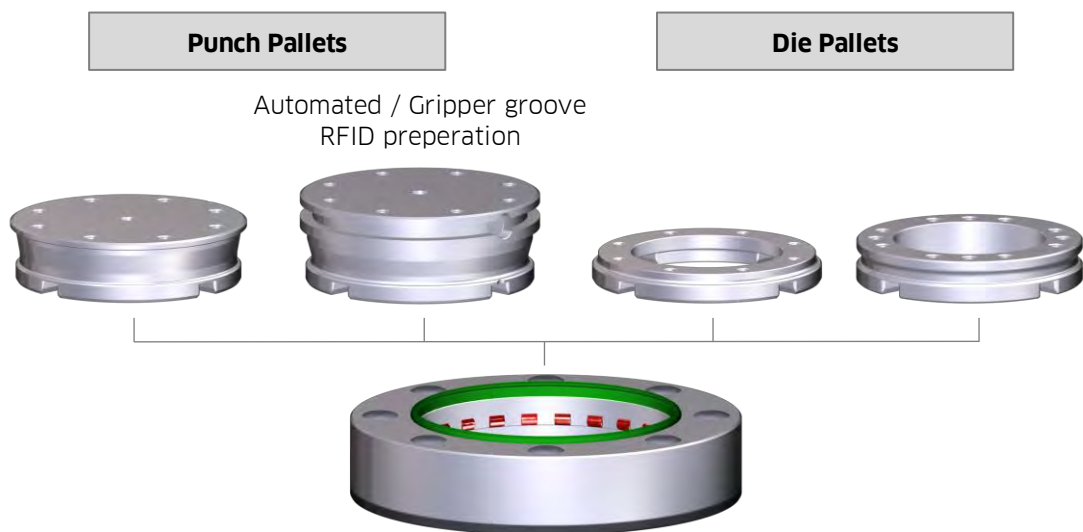
Positioning system	Prism Power P
Repeatability X/Y	+/- 0,001 mm (3 σ value)
Repeatability Z	+/- 0,001 mm (3 σ value)
Indexing	4 x 90°
Clamping	Spring force
Opening	Compressed air 6 / 10 bar
Clamping force	8 500 - 70 000 N
Max. allowed pressure	350 - 5 750 kN
Max. allowed tension	60 - 360 kN



Basic Principle RCS II Chuck



Pallets in various sizes can be clamped in the punch and die clamping systems RCS II.



RCS II Chuck for Single and Multi Level Applications

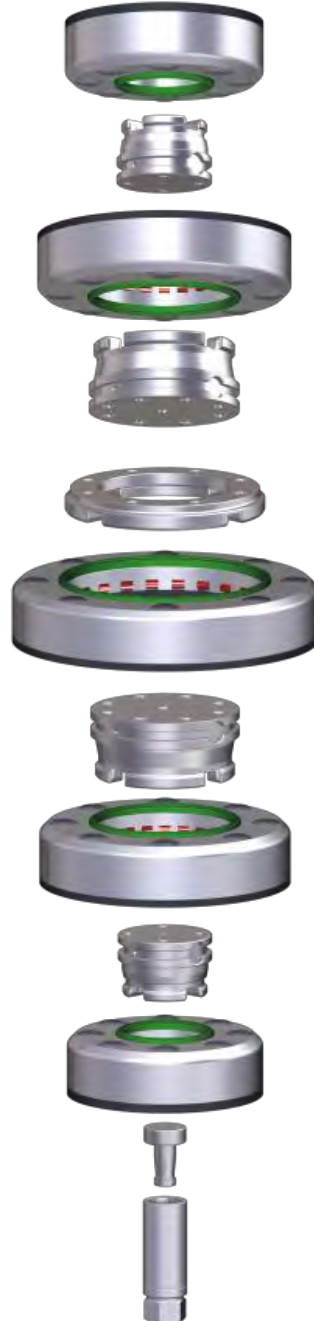
Single Level Application

Compaction force 25 / 50 / 100 tons
RCS II and RCS II Power



Multi Level Application

Compaction force 25 / 50 / 100 tons
RCS II M and RCS II M Power with chamfer



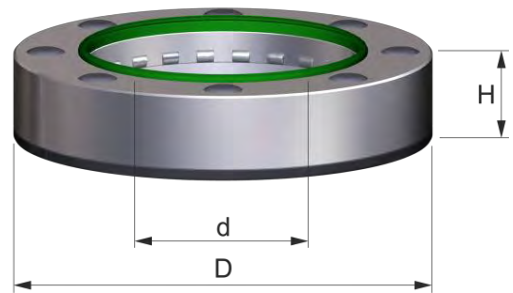
RCS II clamping systems are supplemented by pneumatic core rod clamping systems PRS to a complete Powder Compaction Tooling System.

Chucks with a chamfer are used in multi level applications. Because of the chamfers the press structure is strengthened and the chucks can move closer together, which will shorten the stamp lengths.

Die and Punch Chuck RCS II with ADLC Coating



Material	Steel hardened stainless ADLC coated
Positioning system	Prism Power P
Clamping force 6 bar	8 500 - 30 000 N
Clamping force 10 bar	12 500 - 44 500 N
Max. allowed pressure	350 - 4 500 kN
Max. allowed tension	60 - 200 kN
Air connection	Opening 6 / 10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed from top side
Application	Press and machine tools for clamping of punch and die pallets



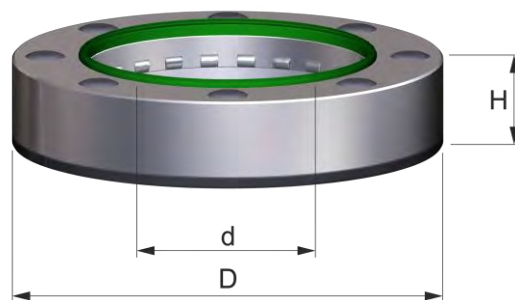
Chuck	RCS II 60	RCS II 95	RCS II 135	RCS II 180	RCS II 230
Product number	P-005 900	P-005 910	P-005 920	P-007 525	P-008 000
Chuck with chamfer	RCS II 60 M	RCS II 95 M	RCS II 135 M	RCS II 180 M	RCS II 230 M
Product number	P-005 905	P-005 915	P-005 925	P-007 530	P-008 005
Air Dock for chuck	RCS II 60 Air Dock	RCS II 95 Air Dock	RCS II 135 Air Dock	RCS II 180 Air Dock	RCS II 230 Air Dock
Product number	P-004 827	P-004 827	P-004 827	P-004 827	P-004 827
d	28,5 mm	62 mm	97 mm	137 mm	182 mm
D	125 mm	160 mm	195 mm	255 mm	305 mm
H	40 mm	40 mm	40 mm	50 mm	50 mm
Clamping force 6 bar	8 500 N	13 000 N	17 000 N	24 000 N	30 000 N
Clamping force 10 bar	12 500 N	18 000 N	25 000 N	36 000 N	44 500 N
Max. allowed pressure	350 kN	850 kN	2 000 kN	3 000 kN	4 500 kN
Max. allowed tension	60 kN	90 kN	120 kN	160 kN	200 kN
Mechanical fixing	8 x M6	8 x M6	8 x M6	8 x M8	8 x M8
Pitch circle clamping ring	95 mm	130 mm	165 mm	220 mm	270 mm
Weight	2,8 kg	3,7 kg	5,4 kg	9,5 kg	12 kg

Pallet RCS PPL	RCS PPL60	RCS PPL95	RCS PPL135	RCS PPL180
Product number	P-004 057	P-004 067	P-004 062	P-007 532
Pallet RCS PP	RCS PP60	RCS PP95	RCS PP135	RCS PP180
Product number	P-001 005	P-002 551	P-004 071	P-000 000
Pallet RCS PD		RCS PD95	RCS PD135	
Product number		P-000 000	P-001 003	
Pallet RCS PDH		RCS PDH95	RCS PDH135	RCS PDH180
Product number		P-000 000	P-002 104	P-007 533
Pallet RCS PPP		RCS PPP 95	RCS PPP 135	RCS PPP180
Product number		P-000 000	P-002 101	P-000 000
Pallet RCS PPH		RCS PPH 95	RCS PPH 135	RCS PPH180
Product number		P-000 000	P-000 000	P-000 000
Pallet RCS PPA		RCS PPA 95	RCS PPA 135	RCS PPA180
Product number		P-000 000	P-002 106	P-000 000

Die and Punch Chuck RCS II HP with ADLC Coating for High Pressure Forces



Material	Steel hardened stainless ADLC coated
Positioning system	Prism Power P
Clamping force 6 bar	13 000 - 30 000 N
Clamping force 10 bar	18 000 - 44 500 N
Max. allowed pressure	1 300 - 5 750 kN
Max. allowed tension	90 - 180 kN
Air connection	Opening 6 / 10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed from top side
Application	Press and machine tools for clamping of punch and die pallets



Chuck	RCS II 95 HP	RCS II 135 HP	RCS II 180 HP	RCS II 230 HP
Product number	P-000 000	P-009 050	P-000 000	P-000 000
Air Dock for chuck	RCS II 95 HP Air Dock	RCS II 135 HP Air Dock	RCS II 180 HP Air Dock	RCS II 230 HP Air Dock
Product number	P-004 827	P-004 827	P-004 827	P-004 827
d	28,5 mm	62 mm	97 mm	137 mm
D	160 mm	195 mm	255 mm	305 mm
H	40 mm	40 mm	50 mm	50 mm
Clamping force 6 bar	13 000 N	17 000 N	24 000 N	30 000 N
Clamping force 10 bar	18 000 N	25 000 N	36 000 N	44 500 N
Max. allowed pressure	1 300 kN	2 500 kN	4 000 kN	5 750 kN
Max. allowed tension	90 kN	120 kN	160 kN	200 kN
Mechanical fixing	8 x M6	8 x M6	8 x M8	8 x M8
Pitch circle clamping ring	130 mm	170 mm	220 mm	270 mm
Weight	4 kg	5,8 kg	8,5 kg	11 kg

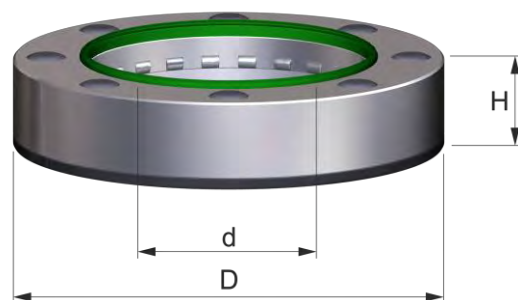
Pallet RCS PPL	RCS PPL95	RCS PPL135	RCS PPL180	
Product number	P-004 067	P-004 062	P-000 000	
Pallet RCS PP	RCS PP95	RCS PP135	RCS PP180	
Product number	P-002 551	P-004 071	P-000 000	
Pallet RCS PD	RCS PD95	RCS PD135		
Product number	P-000 000	P-001 003		
Pallet RCS PDH	RCS PDH95	RCS PDH135	RCS PDH180	RCS PDH230
Product number	P-000 000	P-002 104	P-000 000	P-000 000
Pallet RCS PPP	RCS PPP 95	RCS PPP 135	RCS PPP180	RCS PPP230
Product number	P-000 000	P-002 101	P-000 000	P-000 000
Pallet RCS PPH	RCS PPH 95	RCS PPH 135	RCS PPH180	RCS PPH230
Product number	P-000 000	P-000 000	P-000 000	P-000 000
Pallet RCS PPA	RCS PPA 95	RCS PPA 135	RCS PPA180	RCS PPA230
Product number	P-000 000	P-000 000	P-000 000	P-000 000

Pallet RCS PPL, RCS PP, RCS PD and RCS PDH with reduced maximal allowed pressure and without supervision.

Die and Punch Chuck RCS II Power with ADLC Coating



Material	Steel hardened stainless ADLC coated
Positioning system	Prism Power P
Clamping force 6 bar	12 000 - 47 000 N
Clamping force 10 bar	17 500 - 70 000 N
Max. allowed pressure	350 - 4 500 kN
Max. allowed tension	120 - 400 kN
Air connection	Opening 6 / 10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed from top side
Application	Press and machine tools for clamping of punch and die pallets



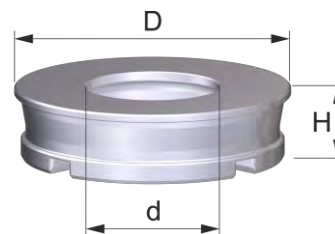
Chuck	RCS II 60 Power	RCS II 95 Power	RCS II 135 Power	RCS II 180 Power	RCS II 230 Power
Product number	P-000 000	P-000 000	P-000 000	P-000 000	P-000 000
d	28,5 mm	62 mm	97 mm	137 mm	182 mm
D	140 mm	175 mm	210 mm	270 mm	330 mm
H	50 mm	50 mm	50 mm	60 mm	60 mm
Clamping force 6 bar	12 000 N	19 000 N	24 000 N	34 000 N	47 000 N
Clamping force 10 bar	17 500 N	26 000 N	36 000 N	50 000 N	70 000 N
Max. allowed pressure	350 kN	850 kN	2 000 kN	3 000 kN	4 500 kN
Max. allowed tension	120 kN	180 kN	240 kN	320 kN	400 kN
Mechanical fixing	8 x M8	8 x M8	8 x M8	8 x M10	8 x M10
Pitch circle clamping ring	110 mm	145 mm	180 mm	220 mm	270 mm
Weight	3,3 kg	4,3 kg	6,3 kg	10,5 kg	13,5 kg

Pallet RCS PPL Power	RCS PPL60	RCS PPL95	RCS PPL135	RCS PPL180	
Product number	P-000 000	P-000 000	P-000 000	P-000 000	
Pallet RCS PDH Power		RCS PDH95	RCS PDH135	RCS PDH180	RCS PDH230
Product number		P-000 000	P-000 000	P-000 000	P-000 000

Cover Pallet RCS CP



Material	Steel / Aluminium
Positioning system	None
Clamping in chuck	RCS / RCS II
Application	Pollution protection for chuck on press, machine tool and measuring machine.



Cover pallet	RCS CP60	RCS CP95	RCS CP135	RCS CP180	RCS CP230
Product number	P-000 871	P-000 872	P-002 108	P-000 000	P-000 000
D	60 mm	95 mm	135 mm	180 mm	230 mm
H	28,5 mm	33 mm	35 mm	43 mm	43 mm
d	28 mm	62 mm	97 mm	137 mm	182 mm
Weight	0,4 kg	1,2 kg	2,7 kg	4,5 kg	6,4 kg

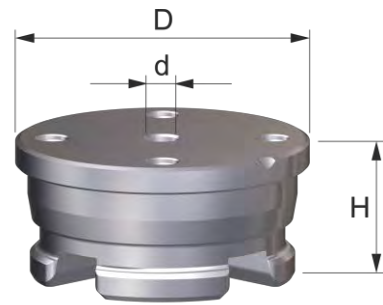
Punch Pallet RCS PPL without Gripper Groove



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	350 – 4 500 kN
Max. allowed tension	60 – 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of punches



Punch pallet	RCS PPL60	RCS PPL95	RCS PPL135	RCS PPL180	RCS PPL230
Product number	P-004 057	P-004 067	P-004 062	P-007 532	P-000 000
D	60 mm	95 mm	135 mm	180 mm	230 mm
H	28,5 mm	33 mm	35 mm	43 mm	43 mm
d	4,5 mm	6,6 mm	8,5 mm	10,5 mm	10,5 mm
Max. allowed pressure	350 kN	850 kN	2 000 kN	3 000 kN	4 500 kN
Max. allowed tension	60 kN	90 kN	120 kN	160 kN	200 kN
Mechanical fixing	4 x M6	8 x M8	8 x M8	8 x M8	8 x M8
Pitch circle	45 mm	76 mm	108 mm	160 mm	205 mm
Weight	0,4 kg	1,3 kg	2,8 kg	4,8 kg	6,8 kg

Punch pallet for draw bar	RCS PPL60 M 10	RCS PPL60 M 20	RCS PPL95 M 10	RCS PPL95 M 20	RCS PPL95 M 42
Product number	P-004 059	P-007 585	P-005 935	P-007 586	P-005 943
D	60 mm	60 mm	95 mm	95 mm	95 mm
H	28,5 mm	28,5 mm	33 mm	33 mm	33 mm
d	8,5 mm	8,5 mm	6,6 mm	6,6 mm	40 mm
	M10 x 1,5	M20 x 1,5	M10 x 1,5	M20 x 1,5	M42 x 2
Max. allowed pressure	350 kN	350 kN	850 kN	850 kN	850 kN
Max. allowed tension	60 kN	60 kN	90 kN	90 kN	90 kN
Mechanical fixing	4 x M6	4 x M6	8 x M8	8 x M8	8 x M8
Pitch circle	45 mm	45 mm	76 mm	76 mm	76 mm
Weight	0,4 kg	0,4 kg	1,3 kg	1,3 kg	1,3 kg

Punch pallet for draw bar	RCS PPL135 M 10	RCS PPL135 M 20	RCS PPL135 M 42
Product number	P-000 000	P-000 000	P-000 000
D	135 mm	135 mm	135 mm
H	28,5 mm	28,5 mm	33 mm
d	8,5 mm	8,5 mm	40 mm
	M10 x 1,5	M20 x 1,5	M42 x 2
Max. allowed pressure	2 000 kN	2 000 kN	2 000 kN
Max. allowed tension	200 kN	200 kN	200 kN
Mechanical fixing	8 x M8	8 x M8	8 x M8
Pitch circle	108 mm	108 mm	108 mm
Weight	6,7 kg	6,5 kg	6 kg

Punch pallet RCS PP with Gripper Groove

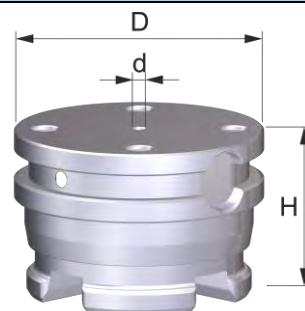


auto

INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	300 - 3 800 kN
Max. allowed tension	60 - 200 kN
Electronic identification	RFID preparation in pallet
Application	Press and machine tools for fixing of punches



Punch pallet	RCS PP60	RCS PP60/70	RCS PP95	RCS PP135	RCS PP180	RCS PP230
Product number	P-000 000	P-004 606	P-002 551	P-004 071	P-000 000	P-000 000
D	60 mm	70 mm	95 mm	135 mm	180 mm	230 mm
H	40 mm	40 mm	45 mm	50 mm	58 mm	58 mm
d	2 mm	0 mm	6,6 mm	8,5 mm	10,5 mm	10,5 mm
Max. allowed pressure	350 kN	350 kN	850 kN	2 000 kN	3 000 kN	4 500 kN
Max. allowed tension	60 kN	60 kN	90 kN	120 kN	160 kN	200 kN
Mechanical fixing	4 x M6	4 x M6	8 x M8	8 x M8	8 x M8	8 x M8
Pitch circle	45 mm	45 mm	76 mm	108 mm	160 mm	210 mm
Weight	0,55 kg	0,8 kg	1,9 kg	4 kg	5,2 kg	7,4 kg

Punch pallet for draw bar	RCS PP60 C M 20	RCS PP60/70 M 10	RCS PP95 M 10	RCS PP95 M 42
Product number	P-001 005	P-004 614	P-005 937	P-000 000
D	60 mm	70 mm	95 mm	95 mm
H	40 mm	40 mm	45 mm	45 mm
d	2 mm / M20 x 1,5	0 mm / M10 x 1,5	6,6 mm / M10 x 1,5	8,5 mm / M42 x 2
Max. allowed pressure	350 kN	350 kN	850 kN	850 kN
Max. allowed tension	60 kN	60 kN	90 kN	90 kN
Mechanical fixing	4 x M6	4 x M6	8 x M8	8 x M8
Pitch circle	45 mm	45 mm	76 mm	76 mm
Weight	0,55 kg	0,8 kg	1,9 kg	1,9 kg

RCS PP60 C with core pin adjustment system.

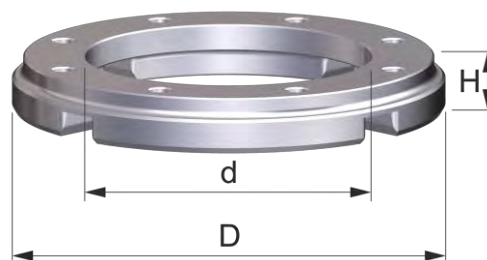
Die Pallet RCS PD



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	850 - 2 000 kN
Max. allowed tension	90 - 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of die



Die pallet	RCS PD95	RCS PD135
Product number	P-000 000	P-001 003
D	93 mm	128 mm
H	16 mm	16 mm
d	49,5 mm	84,5 mm
Max. allowed pressure	850 kN	2 000 kN
Max. allowed tension	90 kN	120 kN
Mechanical fixing	8 x M6	8 x M6
Pitch circle	70 mm	105 mm
Weight	0,5 kg	0,75 kg

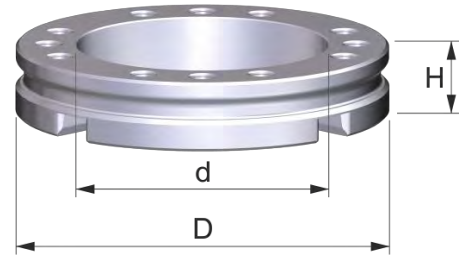
Die Pallet RCS PDH



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	850 - 4 500 kN
Max. allowed tension	70 - 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of die and punch



Die pallet	RCS PDH95	RCS PDH135	RCS PDH180	RCS PDH180	RCS PDH230
Product number	P-007 551	P-002 104	P-007 533	P-007 503	P-008 024
D	93 mm	128 mm	174 mm	174 mm	224 mm
H	24 mm	24 mm	27 mm	27 mm	27 mm
d	51 mm	86 mm	120 mm	136 mm	170 mm
Max. allowed pressure	850 kN	2 000 kN	3 000 kN	3 000 kN	4 500 kN
Max. allowed tension	90 kN	120 kN	160 kN	160 kN	200 kN
Mechanical fixing	8 x M6 8 x M8	12 x M6 12 x M8	8 x M8	8 x M8	8 x M8
Pitch circle	70 mm	105 mm	154 mm	154 mm	204 mm
Weight	0,8 kg	1 kg	1,3 kg	1,2 kg	2 kg

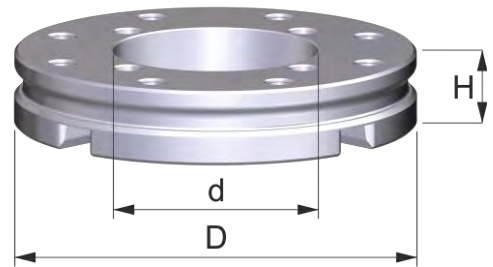
Pallet RCS PPP for High Pressure Forces



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	950 - 5 750 kN
Max. allowed tension	90 - 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of die and punch

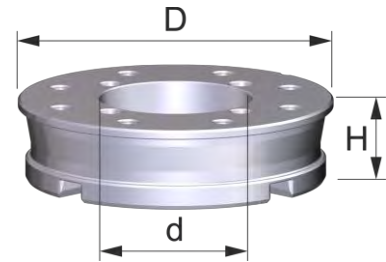


Pallet	RCS PPP95	RCS PPP135	RCS PPP180	RCS PPP230
Product number	P-000 000	P-002 101	P-000 000	P-000 000
D	93 mm	128 mm	174 mm	224 mm
H	24 mm	24 mm	27 mm	27 mm
d	30 mm	65 mm	140 mm	185 mm
Max. allowed pressure	950 kN	1 500 kN	4 000 kN	5 750 kN
Max. allowed tension	90 kN	120 kN	160 kN	200 kN
Mechanical fixing	8 x M6	12 x M6	8 x M8	8 x M8
Pitch circle	70 mm	105 mm	154 mm	204 mm
Weight	1 kg	1,3 kg	2,1 kg	3 kg

Pallet RCS PPH for High Pressure Forces



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	950 - 3 800 kN
Max. allowed tension	90 - 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of die and punch

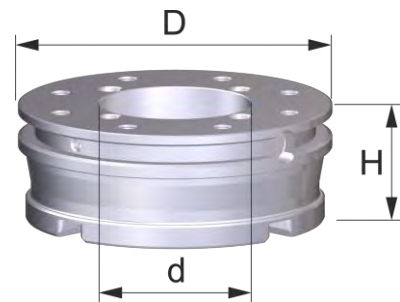


Pallet	RCS PPH95	RCS PPH135	RCS PPH135	RCS PPH180	RCS PPH230
Product number	P-000 000	P-002 109	P-002 107	P-000 000	P-000 000
D	93 mm	135 mm	135 mm	180 mm	230 mm
H	33 mm	35 mm	35 mm	43 mm	43 mm
d	30 mm	8,5 mm	65 mm	140 mm	185 mm
Max. allowed pressure	950 kN	1 500 kN	1 500 kN	2 500 kN	3 800 kN
Max. allowed tension	90 kN	120 kN	120 kN	160 kN	200 kN
Mechanical fixing	8 x M6	8 x M8	8 x M8	8 x M8	8 x M8
Pitch circle	76 mm	108 mm	108 mm	160 mm	210 mm
Weight	1,8 kg	3,4 kg	3,4 kg	5,4 kg	7,8 kg

Pallet RCS PPA with Gripper Groove for High Pressure Forces



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	950 - 3 800 kN
Max. allowed tension	90 - 200 kN
Electronic identification	RFID preparation in tool
Application	Press and machine tools for fixing of die and punch



Pallet	RCS PPA95	RCS PPA135	RCS PPA135	RCS PPA180	RCS PPA230
Product number	P-000 000	P-000 000	P-002 106	P-000 000	P-000 000
D	93 mm	135 mm	135 mm	180 mm	230 mm
H	45 mm	50 mm	50 mm	58 mm	58 mm
d	30 mm	8,5 mm	65 mm	140 mm	185 mm
Max. allowed pressure	950 kN	1 500 kN	1 500 kN	2 500 kN	3 800 kN
Max. allowed tension	90 kN	120 kN	120 kN	160 kN	200 kN
Mechanical fixing	8 x M6	8 x M8	8 x M8	8 x M8	8 x M8
Pitch circle	76 mm	108 mm	108 mm	160 mm	210 mm
Weight	2,3 kg	4,9 kg	4,6 kg	7,2 kg	10 kg

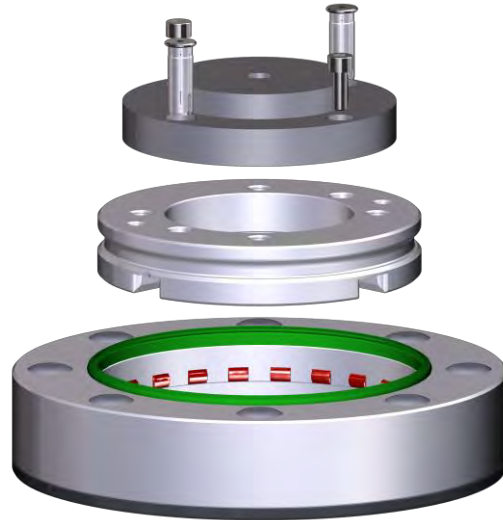
Adaptation RCS II to PMC and Macro° / Refix°

Adaptation and compensation of filling heights, punch lengths and system sizes – change of reference system.

**Adaptation of punch
PMC and Macro° to RCS II 60**



**Adaptation of die
Refix° to RCS II 135**



Adaptation Manual PMC Chuck to RCS PA Pallet



INOX

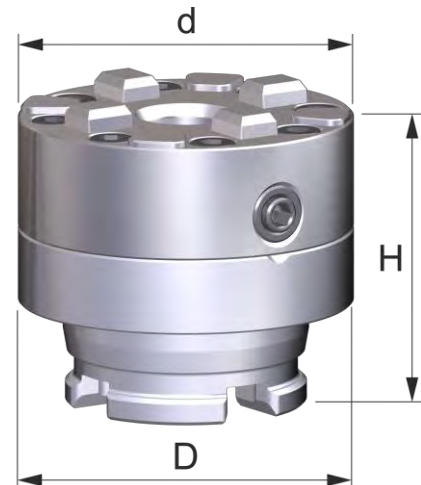


Chuck PMC manual

Material	Steel hardened stainless
Positioning system	Spring lip M
Clamping force	6 000 N
Max. allowed pressure	150 kN
Max. allowed tension	10 kN

Adaptation basis pallet RCS PA

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Electronic identification	RFID optional
Application	Adaptation and compensation of filling heights, punch lengths and system sizes. Operation of different reference clamping systems. Change of reference clamping system.



Adaptation base Chuck	RCS 60 PA PMC manual	RCS 95 PA PMC manual	RCS 135 PA PMC manual
Product number	P-003 410	P-003 420	P-003 415
d	75 mm	75 mm	75 mm
D	75 mm	95 mm	135 mm
H	67 mm	57 mm	62 mm
Max. allowed pressure	150 kN	150 kN	150 kN
Max. allowed tension	10 kN	10 kN	10 kN
Weight	1,5 kg	2,0 kg	3,0 kg

Adaptation Manual Refix° Positioning System to RCS PPP135 Pallet



INOX

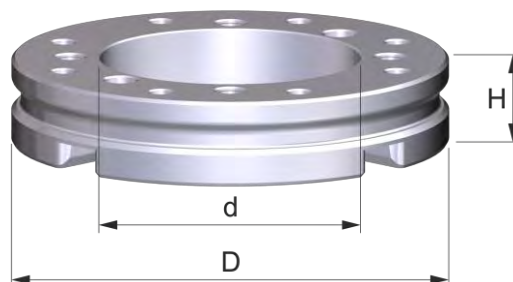


Chuck Refix° manual

Material	Steel hardened stainless
Positioning system	Refix° manual

Adaptation basis pallet RCS PPP130

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Max. allowed pressure	2 000 kN
Max. allowed tension	70 - 100 kN
Electronic identification	RFID optional
Application	Clamping of dies with Refix° pins (symmetric / asymmetric) on pallet RCS PPP135. Operation of different reference clamping systems. Change of reference clamping system.



Pallet	RCS PPP135 Refix° symmetric	RCS PPP135 Refix° asymmetric
Product number	P-002 127	P-002 124
Refix° hole distance	45/45 mm	44/46 mm
d	76 mm	76 mm
D	127,6 mm	127,6 mm
H	24 mm	24 mm
Max. allowed pressure	2 000 kN	2 000 kN
Max. allowed tension	90 kN	90 kN
Mechanical fixing	8 x M6	8 x M6
Pitch circle	105 mm	105 mm
Weight	1,2 kg	1,2 kg

Sealing Ring for Pallet RSC PPP135

Product number P-000 068

Material	Steel stainless
Mechanical fixing	Screwed on Pallet RCS PPP135
Application	Sealing of die with Refix° pins (symmetrical / asymmetrical) on pallet RCS PPP135 against chuck RCS II 135.



Adaptation Pneumatic PMC Chuck to RCS PA Pallet

Adaptation Pneumatic PMC Chuck to RCS PA Pallet

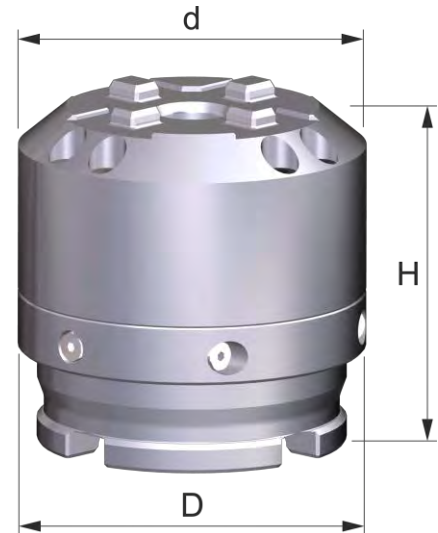


PMC Macro° pneumatic

Material	Steel hardened stainless
Positioning system	Spring lip M
Clamping force 6 bar	8 000 N (6 bar reclamping)
Clamping force 10 bar	9 500 N (6 bar reclamping)
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Air connection	Opening 6 bar / 10 bar Cleaning, reclamping and supervising 2 - 6 bar
Operation	Air supply manual from side Air supply automatic through base chuck / Air Dock.

Adaptation basis pallet RCS PA

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Electronic identification	RFID optional
Application	Adaptation and compensation of filling heights, punch lengths and system sizes. Operation of different reference clamping systems. Change of reference clamping system.



Adaptation	RCS 60/100 PA PMC pneumatic	RCS 95/100 PA PMC pneumatic	RCS 135 PA PMC pneumatic
Product number	P-003 435	P-002 250	P-002 265
Air Dock for pallet	RCS 60/100 PA PMC pneumatic Air Dock	RCS 95/100 PA PMC pneumatic Air Dock	RCS 135 PA PMC pneumatic Air Dock
Product number	P-004 816	P-004 816	P-004 816
d	100 mm	100 mm	100 mm
D	100 mm	100 mm	135 mm
H	96 mm	98 mm	98 mm
Max. allowed pressure	150 kN	150 kN	150 kN
Max. allowed tension	10 kN	10 kN	10 kN
Weight	2,5 kg	3 kg	3,5 kg

Adaptation RCS II to RCS II

Adaptation of punch clamping systems for compensation of filling heights, punch lengths and system sizes.

Adaptation RCS II 60 to RCS II 60
Compensation of punch length



Adaptation RCS II 60 to RCS II 95
Compensation of system sizes



Compressed air for opening, cleaning and supervising of the adaptation chuck is provided by the base chuck using the Air Dock function. The Air Dock in the base chuck and in the pallet of the adaptation chuck connects the air supply between the both chucks automatically. Optionally, the compressed air can also be supplied radially from the side by hose couplings to the adaptation chuck.

Adaptation RCS II Chuck to RCS PA Pallet

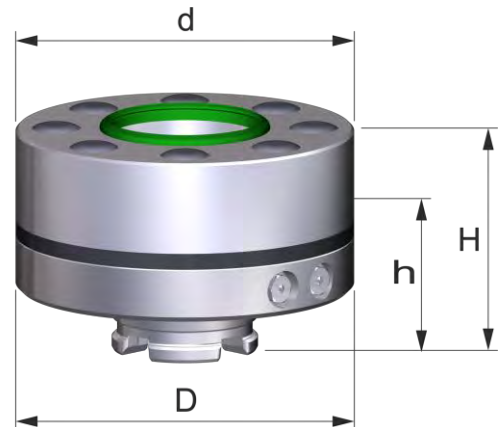


Chuck RCS II pneumatic

Material	Steel hardened stainless
Positioning system	Prism Power P
Operation	Air supply manual from side Air supply automatic through base chuck / Air Dock.

Adaptation basis pallet RCS PA

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Electronic identification	RFID optional
Application	Adaptation and compensation of filling heights, punch lengths and system sizes.



Adaptation base Chuck	RCS 60 PA RCS II 60	RCS 95 PA RCS II 60	RCS 135 PA RCS II 60	RCS 95 PA RCS II 95	RCS 135 PA RCS II 95
Product number	P-004 050	P-004 828	P-004 026	P-004 822	P-004 005
Air Dock for pallet	RCS 60 PA Air Dock	RCS 95 PA Air Dock	RCS II 135 PA Air Dock	RCS 95 PA Air Dock	RCS 135 PA Air Dock
Product number	P-004 816	P-004 816	P-004 816	P-004 816	P-004 816
d	125 mm	125 mm	125 mm	160 mm	160 mm
D	125 mm	125 mm	134 mm	160 mm	160 mm
h (Z0 zu Z0)	63 mm	65 mm	65 mm	61 mm	65 mm
H	82 mm	85 mm	83,5 mm	85 mm	99 mm
Clamping force 10 bar	12 500 N	12 500 N	12 500 N	18 000 N	18 000 N
Max. allowed pressure	300 kN	300 kN	300 kN	700 kN	700 kN
Max. allowed tension	60 kN	60 kN	60 kN	90 kN	90 kN
Weight	4,8 kg	5,1 kg	5,5 kg	5,3 kg	5,7 kg

Air Dock RCS / RCS II Clamping System



auto



INOX



Material	Steel stainless
Compressed Air	6 / 10 bar
Mechanical fixing	Pressing, gluing, screwing in chuck and pallet
Application	Automatic compressed air coupling system for air supply from base chuck to the adaptation chuck.



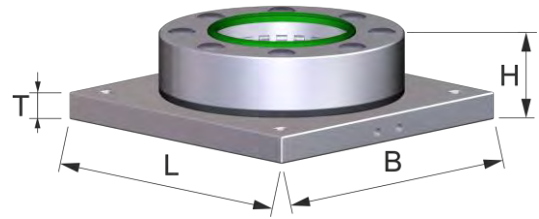
Air Dock	Chuck	Pallet
Product number	P-004 827	P-004 816

RCS II Chuck and Alignment Pallets for the Tool Shop

Die and Punch Chuck RCS II on Base Plate



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force 6 bar	8 500 - 30 000 N
Clamping force 10 bar	12 500 - 44 500 N
Max. allowed pressure	350 - 4 500 kN
Max. allowed tension	60 - 200 kN
Air connection	Opening 6/10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing base plate	Screwed from top side
Application	Machine tools for clamping of die and punch pallets.



Chuck	RCS II 60	RCS II 95	RCS II 135	RCS II 180	RCS II 230
Product number	P-005 900	P-005 910	P-005 920	P-007 525	P-008 000
Chuck for WEDM, ECM	RCS II 60 SL	RCS II 95 SL	RCS II 135 SL	RCS II 180 SL	RCS II 230 SL
Product number	P-005 900 SL	P-005 910 SL	P-005 920 SL	P-007 525 SL	P-008 000 SL
Air Dock for chuck	RCS II 60 Air Dock	RCS II 95 Air Dock	RCS II 135 Air Dock	RCS II 180 Air Dock	RCS II 230 Air Dock
Product number	P-004 827	P-004 827	P-004 827	P-004 827	P-004 827
Clamping force 6 bar	8 500 N	13 000 N	17 000 N	24 000 N	30 000 N
Clamping force 10 bar	12 500 N	18 000 N	25 000 N	36 000 N	44 500 N
Max. allowed pressure	350 kN	850 kN	2 000 kN	3 000 kN	4 500 kN
Max. allowed tension	60 kN	90 kN	120 kN	160 kN	200 kN
Weight	5,1 kg	7,4 kg	9,8 kg	15,1 kg	19,6 kg

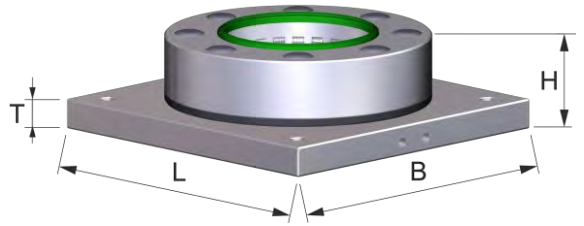
Base plate with flushing without center hole	RCS 60 BF	RCS 95 BF	RCS 135 BF	RCS 180 BF	RCS 230 BF
Product number	P-004 680	P-004 681	P-004 682	P-000 000	P-000 000
Base plate without flushing with center hole	RCS 60 BH	RCS 95 BH	RCS 135 BH	RCS 180 BH	RCS 230 BH
Product number	P-004 677	P-004 678	P-004 679	P-000 000	P-000 000
B x L	130 x 130 mm	165 x 165 mm	200 x 200 mm	245 x 245 mm	270 x 270 mm
T	18 mm	20 mm	22 mm	24 mm	26 mm
H	58 mm	60 mm	62 mm	74 mm	76 mm
Mechanical fixing	4 x M8 100 x 100 mm	4 x M8 130 x 130 mm	4 x M10 160 x 160 mm	4 x M10 - mm	4 x M10 - mm
Weight	5,1 kg	7,4 kg	9,8 kg	15,1 kg	19,6 kg

Pallet RCS PPL	RCS PPL60	RCS PPL95	RCS PPL135	RCS PPL180
Product number	P-004 057	P-004 067	P-004 062	P-007 532
Pallet RCS PP	RCS PP60	RCS PP95	RCS PP135	RCS PP180
Product number	P-001 005	P-002 551	P-004 071	P-000 000
Pallet RCS PD	RCS PD95	RCS PD135		
Product number	P-000 000	P-001 003		
Pallet RCS PDH	RCS PDH95	RCS PDH135	RCS PDH180	RCS PDH230
Product number	P-000 000	P-002 104	P-007 533	P-000 000
Pallet RCS PPP	RCS PPP 95	RCS PPP 135	RCS PPP180	RCS PPP230
Product number	P-000 000	P-002 101	P-000 000	P-000 000
Pallet RCS PPH	RCS PPH 95	RCS PPH 135	RCS PPH180	RCS PPH230
Product number	P-000 000	P-000 000	P-000 000	P-000 000

Die and Punch Chuck RCS II HP on Base Plate



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force 6 bar	8 500 - 30 000 N
Clamping force 10 bar	12 500 - 44 500 N
Max. allowed pressure	1 300 - 3 800 kN
Max. allowed tension	90 - 200 kN
Air connection	Opening 6/10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Mechanical fixing base plate	Screwed from top side
Application	Machine tools for clamping of die and punch pallets.



Chuck	RCS II 95 HP	RCS II 135 HP	RCS II 180 HP	RCS II 230 HP
Product number	P-000 000	P-000 000	P-000 000	P-000 000
Chuck for WEDM, ECM	RCS II 95 HP SL	RCS II 135 HP SL	RCS II 180 HP SL	RCS II 230 HP SL
Product number	P-000 000	P-002 589	P-000 000	P-000 000
Air Dock for chuck	RCS II 95 Air Dock	RCS II 135 Air Dock	RCS II 180 Air Dock	RCS II 230 Air Dock
Product number	P-004 827	P-004 827	P-004 827	P-004 827
Clamping force 6 bar	13 000 N	17 000 N	24 000 N	30 000 N
Clamping force 10 bar	18 000 N	25 000 N	36 000 N	44 500 N
Max. allowed pressure	1 300 kN	2 500 kN	2 500 kN	3 800 kN
Max. allowed tension	90 kN	120 kN	160 kN	200 kN
Weight	7,4 kg	9,8 kg	15,1 kg	19,6 kg

Base plate with flushing without center hole	RCS 95 BF	RCS 135 BF	RCS 180 BF	RCS 230 BF
Product number	P-000 000	P-000 000	P-000 000	P-000 000
Base plate without flushing with center hole	RCS 95 BH	RCS 135 BH	RCS 180 BH	RCS 230 BH
Product number	P-004 678	P-004 679	P-000 000	P-000 000
B x L	165 x 165 mm	200 x 200 mm	245 x 245 mm	270 x 270 mm
T	20 mm	22 mm	24 mm	26 mm
H	60 mm	62 mm	74 mm	76 mm
Weight	7,7 kg	10,2 kg	15,6 kg	20,3 kg

Pallet RCS PPL	RCS PPL95	RCS PPL135	RCS PPL180	
Product number	P-004 067	P-004 062	P-007 532	
Pallet RCS PP	RCS PP95	RCS PP135	RCS PP180	
Product number	P-002 551	P-004 071	P-000 000	
Pallet RCS PD	RCS PD95	RCS PD135		
Product number	P-000 000	P-001 003		
Pallet RCS PDH	RCS PDH95	RCS PDH135	RCS PDH180	RCS PDH230
Product number	P-000 000	P-002 104	P-007 533	P-000 000
Pallet RCS PPP	RCS PPP 95	RCS PPP 135	RCS PPP180	RCS PPP230
Product number	P-000 000	P-002 101	P-000 000	P-000 000
Pallet RCS PPH	RCS PPH 95	RCS PPH 135	RCS PPH180	RCS PPH230
Product number	P-000 000	P-000 000	P-000 000	P-000 000
Pallet RCS PPH	RCS PPA 95	RCS PPA 135	RCS PPA180	RCS PPA230
Product number	P-000 000	P-002 106	P-000 000	P-000 000

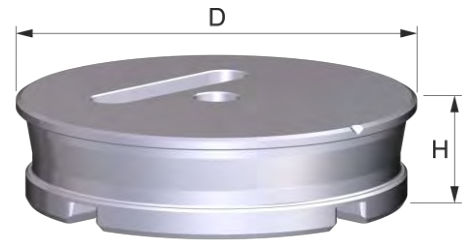
Alignment Pallet RCS PA



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in chuck	RCS / RCS II
Application	Alignment and referencing of chuck on machine tool and measuring machine.



Alignment pallet	RCS PA60	RCS PA95	RCS PA135	RCS PA180	RCS PA230
Product number	P-003 922	P-003 923	P-003 924	P-000 000	P-000 000
Mechanical interface	RCS 60 RCS II 60	RCS 95 RCS II 95	RCS 135 RCS II 135	RCS 180 RCS II 180	RCS 230 RCS II 230
D	60 mm	95 mm	135 mm	180 mm	230 mm
H	28,5 mm	33 mm	35 mm	43 mm	43 mm
Weight	0,4 kg	1,2 kg	2,7 kg	5 kg	7 kg

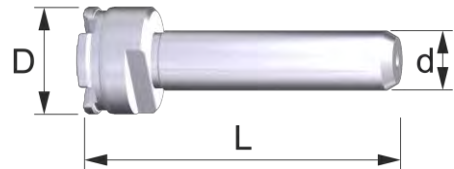
Alignment Pin RCS APA



INOX



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in Chuck	RCS / RCS II
Application	Alignment and referencing of chuck on machine tool and measuring machine.

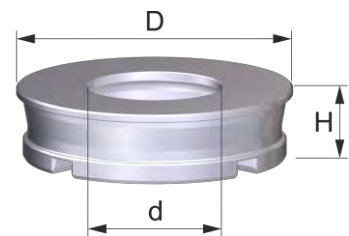


Alignment pin	RCS APA60	RCS APA95	RCS APA135	RCS APA180	RCS APA230
Product number	P-002 683	P-000 000	P-000 000	P-000 000	P-000 000
Mechanical interface	RCS 60 RCS II 60	RCS 95 RCS II 95	RCS 135 RCS II 135	RCS 180 RCS II 180	RCS 230 RCS II 230
D	60 mm	95 mm	135 mm	180 mm	230 mm
L	160 mm	160 mm	160 mm	160 mm	160 mm
d	30 mm	30 mm	30 mm	30 mm	30 mm
Weight	1 kg	1,2 kg	1,5 kg	2,2 kg	3,5 kg

Cover Pallet RCS CP



Material	Steel / Aluminium
Positioning system	None
Clamping in chuck	RCS / RCS II
Application	Pollution protection for chuck on press, machine tool and measuring machine.



Cover pallet	RCS CP60	RCS CP95	RCS CP135	RCS CP180	RCS CP230
Product number	P-000 871	P-000 872	P-002 108	P-000 000	P-000 000
D	60 mm	95 mm	135 mm	180 mm	230 mm
H	28,5 mm	33 mm	35 mm	41 mm	48 mm
d	29 mm	62 mm	97 mm	137 mm	182 mm
Weight	0,4 kg	1,2 kg	2,7 kg	4,5 kg	6,4 kg

Quick Chuck 100 P and 130 P for RCS Pallets

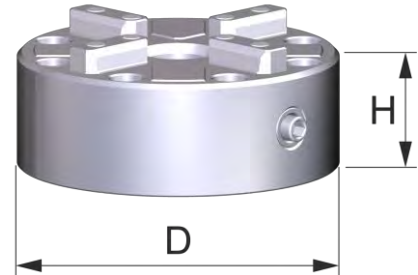
Quick Chuck100 PM Manual for RCS Pallets with Draw Bar



INOX

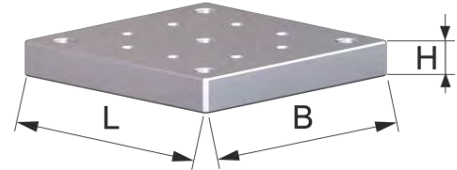


Chuck	Quick Chuck 100 PM manual
Product number	P-003 430
D x H	100 x 36 mm
Weight	1,9 kg
Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force	6 000N
Air connection	None
Operation	Radial clamping screw
Mechanical fixing	Screwed from top side 8 x M6
Application	Machine tools for clamping of punch pallets RCS 60, PM 56/60, PM 85 und RCS 95 with draw bar.



Base plate for Quick Chuck 100 PM without flushing

Product number	P-003 427
Material	Steel hardened stainless
Base plate for Quick Chuck 100 PM with flushing	
Product number	P-000 000
Material	Steel hardened stainless
B x L x H	110 x 110 x 18 mm
Mechanical fixing	4 x M8 80 x 80 mm Screwed from top side
Weight	2,3 kg



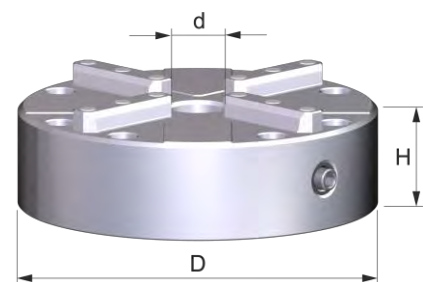
Quick Chuck130 PM Manual for RCS Pallets with Draw Bar



INOX



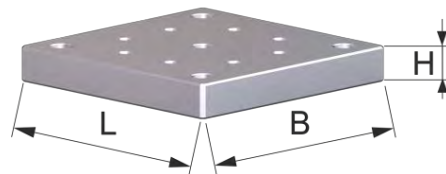
Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force	6 000N
Air connection	None
Operation	Radial clamping screw
Mechanical fixing	Screwed from top side 8 x M6
Application	Machine tools for clamping of punch pallets RCS 60, PM 56/60, PM 85, RCS 95 and RCS 135 with draw bar.



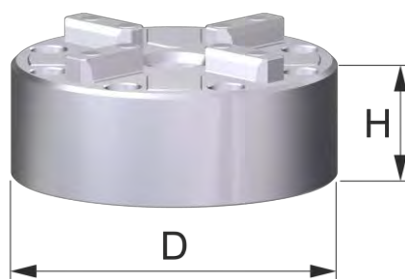
Chuck	Quick Chuck 130 PM manual Draw bar M10 and M20	Quick Chuck 130 PM manual Draw bar M42
Product number	P-003 450	P-003 440
Pallet	RCS 60, PM 56/60, PM 85, RCS 95 and RCS 135	RCS 95 and RCS 135
D	130 mm	130 mm
H	36 mm	36 mm
d	20 mm	50 mm
Weight	2,7 kg	2,5 kg

Base plate for Quick Chuck 130 PM without flushing

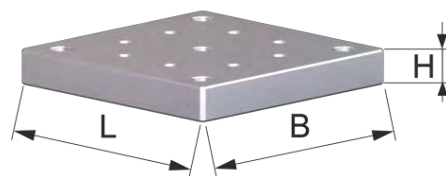
Product number	P-000 000
Material	Steel hardened stainless
Base plate for Quick Chuck 130 PM with flushing	
Product number	P-000 000
Material	Steel hardened stainless
B x L x H	140 x 140 x 20 mm
Mechanical fixing	4 x M8 110 x 110 mm Screwed from top side
Weight	2,8 kg

**Quick Chuck100 PP Pneumatic for RCS Pallets with Draw Bar**

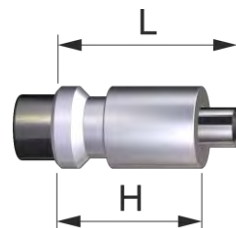
Chuck	Quick Chuck 100 PP pneumatic
Product number	P-000 000
D x H	100 x 42 mm
Weight	2,5 kg
Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force	6 000N
Air connection	Opening 6 bar, cleaning and supervising 1 bar, reclamping 6 bar
Operation	Pneumatic control and support unit
Mechanical fixing base plate	Screwed from top side 8 x M6
Application	Machine tools for clamping of punch pallets RCS 60, PM 56/60, PM 85 und RCS 95 with draw bar.

**Base plate for Quick Chuck 100 PP without flushing**

Product number	P-000 000
Material	Steel hardened stainless
Base plate for Quick Chuck 100 PP with flushing	
Product number	P-000 000
Material	Steel hardened stainless
B x L x H	110 x 110 x 18 mm
Mechanical fixing	4 x M8 80 x 80 mm Screwed from top side
Weight	2,3 kg

**Draw Bar M 10 for Quick Chuck 100 PM, 100 PP und 130 PM**

Draw bar	M 10 OPC ITS RCS APA	M 10 RCS PPL60 M 10 RCS PPL95 M 10 RCS PPL135 M10	M 10 Alignment pin with M10
Product number	P-005 975	P-005 970	P-005 971
H	35,85 mm	33,5 mm	33,5 mm
L	45 mm	50 mm	55 mm
Weight	0,05 kg	0,05 kg	0,05 kg



Draw Bar M 20 and M 42 for Quick Chuck 100 PM, 100 PP and 130 PM

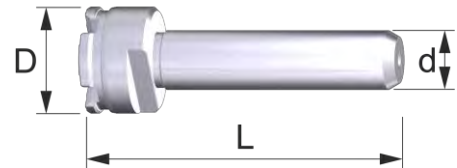
Draw bar	M 20 RCS PP60C	M 42 RCS PP95 M 42 RCS PPL95 M 42 RCS PPL135 M42
Product number	P-005 980	P-005 939
d	M20 x 1,5	M42 x 2
Weight	0,1 kg	0,15 kg



Alignment Pin RCS APA



Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping in Chuck	RCS / RCS II
Application	Alignment and referencing of chuck on machine tool and measuring machine.



Alignment Pin	RCS APA60	RCS APA95	RCS APA135	RCS APA180	RCS APA230
Product number	P-002 683	P-000 000	P-000 000	P-000 000	P-000 000
D	60 mm	95 mm	135 mm	180 mm	230 mm
L	160 mm	160 mm	160 mm	160 mm	160 mm
d	30 mm	30 mm	30 mm	30 mm	30 mm
Weight	1 kg	1,2 kg	1,5 kg	2,2 kg	3,5 kg

PMC Clamping System



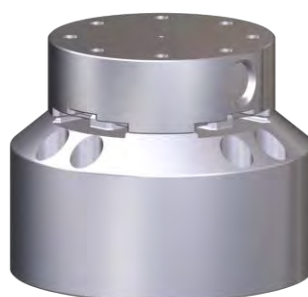
Reference clamping system for clamping of punches on PMC and Macro° pallets

Operating

Chuck will be opened by compressed air and afterwards the pallet can be inserted. After unpressurizing the chuck the pallet will be clamped by a spring activated clamping mechanism. To unclamp the pallet the chuck must be opened by compressed air again. Chuck are equipped with reclamping function to increase the clamping force.



Inserting



Clamped



Opening

Technical Data

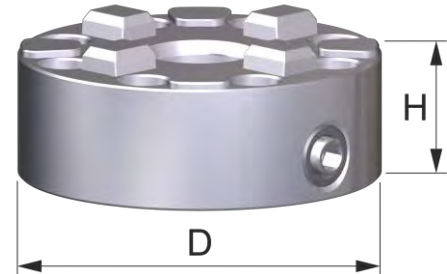
Positioning system	Spring Lip M
Repeatability X/Y	+/- 0,002 mm (3 σ value)
Repeatability Z	+/- 0,002 mm (3 σ value)
Indexing	4 x 90°
Clamping	Manual, spring force Pneumatic reclamping
Opening	Manual, spring force
Clamping force	2 500 – 9 500 kN
Max. allowed pressure	150 kN
Max. allowed tension	10 kN

Manual PMC Chuck

Manual PMC Chuck

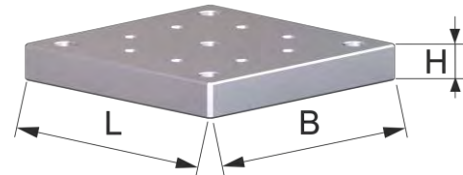


Chuck	PMC manual
Product number	P-003 413
D x H	75 x 27 mm
Weight	1,9 kg
Material	Steel hardened stainless
Positioning system	Spring lip M
Clamping force	6 000N
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Air connection	None
Operation	Radial clamping screw
Mechanical fixing	Screwed from top side 8 x M6
Application	Press and machine tools for clamping of PMC and Macro° pallets



Base plate for manual PMC without flushing

Product number	P-002 907
Material	Steel hardened stainless
Base plate for manual PMC with flushing	
Product number	P-000 000
Material	Steel hardened stainless
B x L x H	96 x 96 x 18 mm
Mechanical fixing	4 x M8 78 x 78 mm Screwed from top side
Weight	2,3 kg



Draw Bar for Manual PMC and Macro° Chuck

Product number	P-003 499
d	7 mm (to 10 mm expandable)
D	19,8 mm
Weight	0,05 kg



Pneumatic PMC Chuck

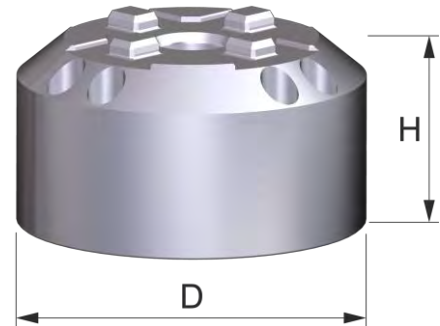
Pneumatic PMC Chuck



INOX

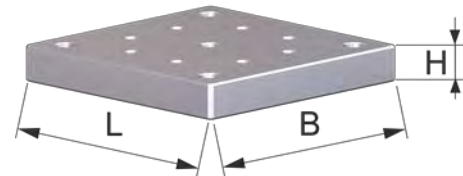


Chuck	PMC pneumatic
Product number	P-003 475
D x H	100 x 54 mm
Weight	2 kg
Material	Steel hardened stainless
Positioning system	Spring lip M
Clamping force 6 bar	8 000N (reclamping 6 bar)
Clamping force 10 bar	9 500N (reclamping 6 bar)
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Air connection	Opening 6 / 10 bar Cleaning, supervising and reclamping 2 - 6 bar
Operation	Pneumatic control and support unit
Mechanical fixing	Screwed from top side 8 x M6
Application	Press and machine tools for clamping of PMC and Macro° pallets



Base plate for pneumatic PMC without flushing

Product number	P-002 271
Material	Steel hardened stainless
Base plate for pneumatic PMC with flushing	
Product number	P-000 000
Material	Steel hardened stainless
B x L x H	130 x 130 x 18 mm
Mechanical fixing	4 x M8 100 x 100 mm Screwed from top side
Weight	3 kg



Draw Bar for Pneumatic PMC and Macro° Chuck

Product number	P-002 244
d	7 mm (to 10,2 mm expandable)
D	19,8 mm
Weight	0,75 kg

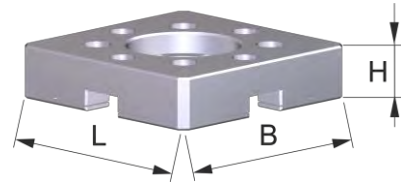


Pallets PMC for PMC chuck

Pallet PMC P15 54 x 54 x 12,5 for PMC and Macro° Chuck



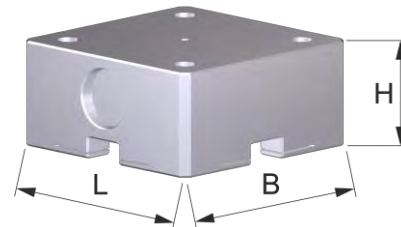
Product number	P-002 206
Material	Steel hardened stainless
Positioning system	Spring lip M
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Application	Mechanical fixing of work piece or tool
B x L x H	54 x 54 x 12,5 mm
Mechanical fixing	4 x M6 from the bottom
Pitch circle	40 mm
Weight	0,15 kg



Pallet PMC P15 54 x 54 for PMC and Macro° Chuck



Material	Steel hardened stainless
Positioning system	Spring lip M
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Application	Mechanical fixing of work piece or tool
Mechanical fixing	4 x M6 from the top
Pitch circle	54 mm

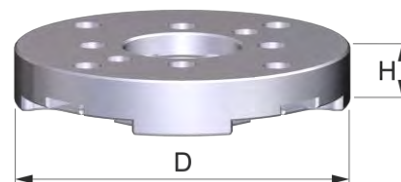


Pallet	PMC P15 54 x 54 H22	PMC P15 54 x 54 H30 Center pin system	PMC P15 54 x 54 H40 Center pin system
Product number	P-002 219	P-000 000	P-005 776
B x L	54 x 54 mm	54 x 54 mm	54 x 54 mm
H	22 mm	30 mm	40 mm
Weight	0,35 kg	0,60 kg	0,75 kg

Pallet PMC P15 d 75 x 12,5 for PMC and Macro° Chuck



Product number	P-002 209
Material	Steel hardened stainless
Positioning system	Spring lip M
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Application	Mechanical fixing of work piece or tool
D x H	75 x 12,5 mm
Mechanical fixing	4 x M6 from the bottom
Pitch circle	40 mm
Weight	0,20 kg



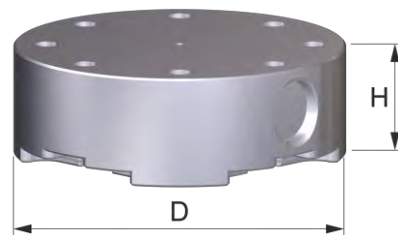
Pallet PMC P15 D75 for PMC and Macro° Chuck



INOX



Material	Steel hardened stainless
Positioning system	Spring lip M
Max. allowed pressure	150 kN
Max. allowed tension	10 kN
Application	Mechanical fixing of work piece or tool
Mechanical fixing	8 x M6 from the top
Pitch circle	60 mm



Pallet	PMC P15 D75 H22	PMC P15 D75 H30 Center pin system	PMC P15 D75 H40 Center pin system
Product number	P-002 242	P-005 786	P-005 781
D	75 mm	75 mm	75 mm
H	22 mm	30 mm	40 mm
Gewicht	0,35 kg	0,60 kg	0,75 kg

Adaptation manual RCS II Chuck to PMC and Macro° Pallet

Adaptation manual RCS II 60 Chuck to PMC and Macro° Pallet



INOX



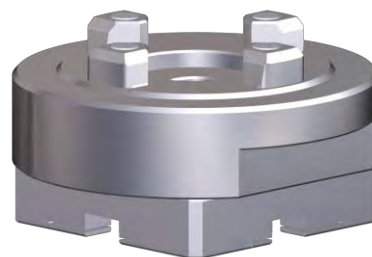
Adaption base	PMC
Chuck	RCS II 60 manual
Product number	P-002 255

Chuck RCS II 60 manual

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force	Manual
Max. allowed pressure	150 kN
Max. allowed tension	10 kN

Adaption base pallet PMC

Material	Steel hardened stainless
Positioning system	Spring lip M
Clamping in chuck	PMC / Macro°
Electronic identification	RFID optional
Application	Adaptation RCS II 60 to PMC and Macro°. Operation of different reference clamping systems. Change of reference clamping system.

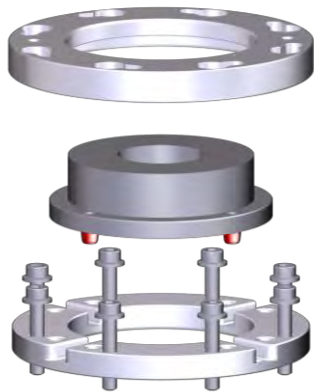


Clamping Device for Adaptation of Manual RCS II 60 Chuck to PMC and Macro° Palette

Product number	P-002 257
d	M 10
D	M20 x 1,5
Weight	0,05 kg



MCS Manual Clamping System



Reference clamping system for clamping of punches, punch carriers and dies

Modular design

Adaptation to different punch and die geometries and compressive and tensile forces is possible.

Scaling

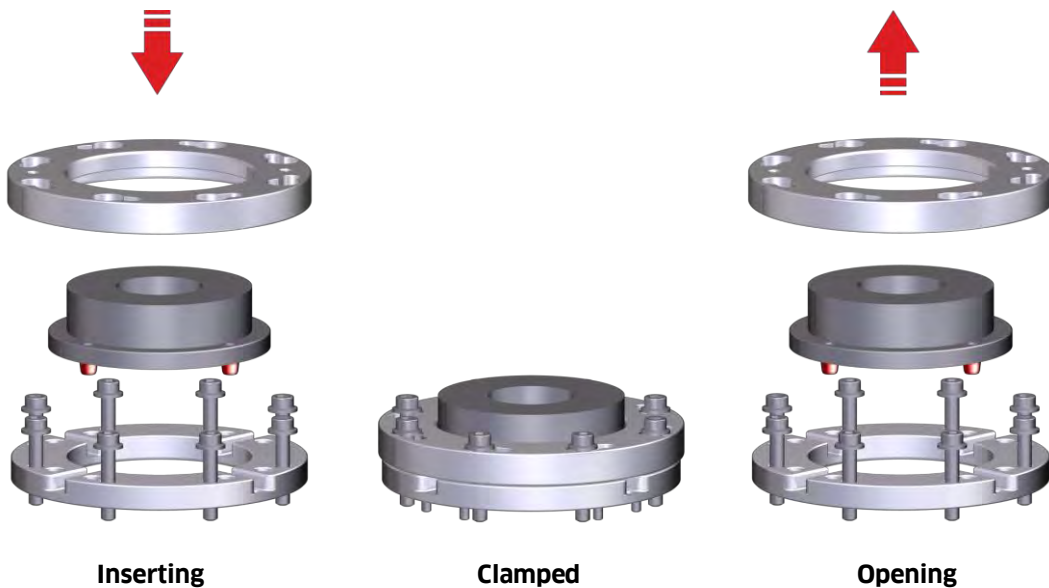
Different sizes cover the requirements of compaction tools and the compaction process. Usage for co axial and multi axial compaction processes with highest compressive and tensile forces.

Operating

Chuck will be opened and closed manually by screws. Tools and work pieces can be screwed directly in the chuck or can be clamped over a screw operated bayonet ring. The positioning is done by SCS K cones and ground grooves.

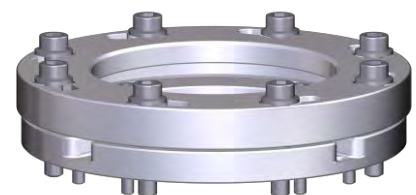
Manual Die Reference Clamping System MCS D

Positioning and clamping of die with clamping ring

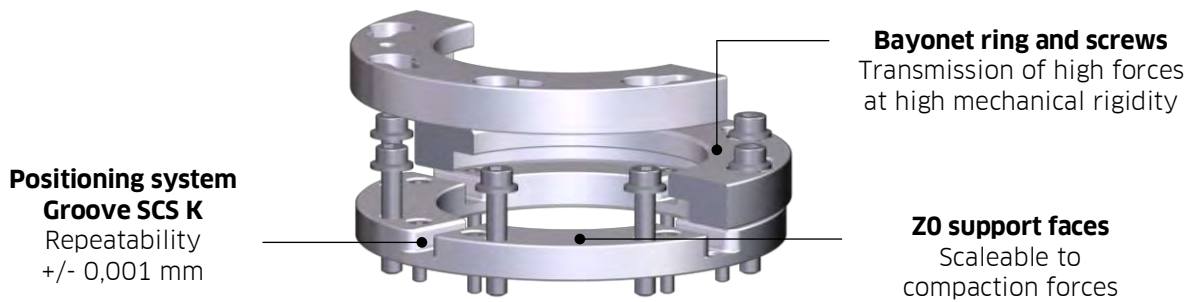


Technical Data

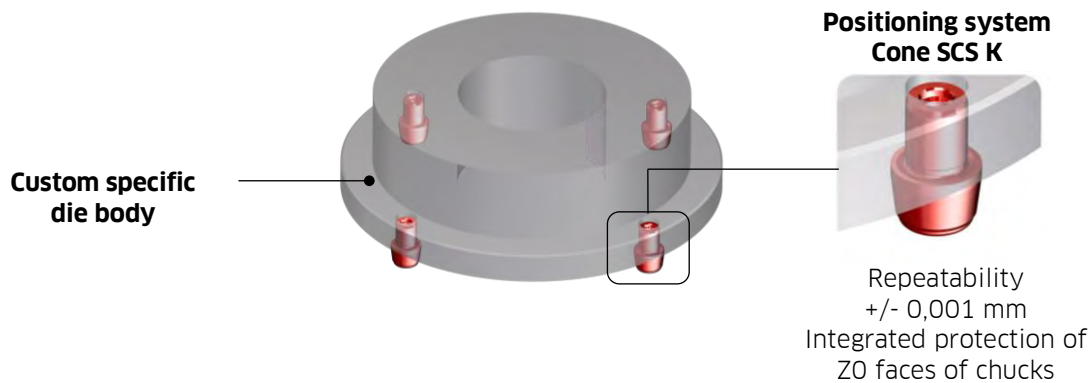
Positioning system	Cone SCS K
Repeatability X/Y	+/- 0,001mm (3 σ value)
Repeatability Z	+/- 0,001mm (3 σ value)
Indexing	4 x 90°
Clamping	Manual, bayonet ring / screws
Opening	Manual, bayonet ring / screws
Clamping force	240 - 2 500 kN
Max. allowed pressure	8 700 - 30 000 kN
Max. allowed tension	120 - 1 000 kN



Basic Principle MCS Die Chuck



Basic Principle MCS Die



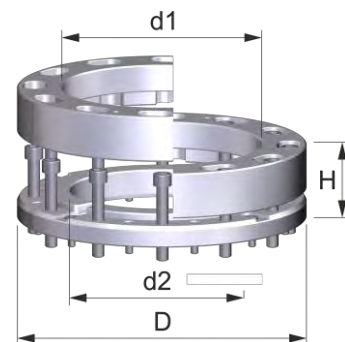
Manual Die Chuck MCS D



INOX



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	950 - 2 500 kN
Max. allowed pressure	12 000 - 30 000 kN
Max. allowed tension	400 - 1 000 kN
Air connection	None, manual clamping
Operation	Manual clamping
Application	Press and machine tools for manual clamping of dies.

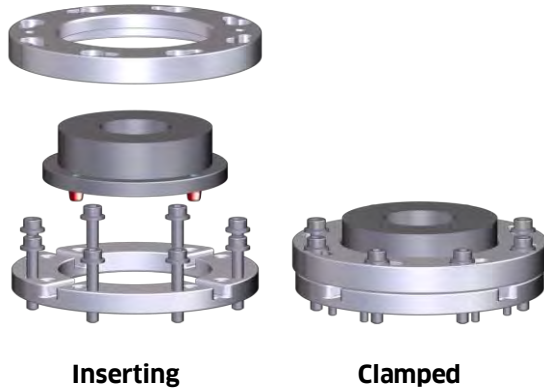


Chuck	MCS D200	MCS D250	MCS D300	MCS D350	MCS D400	MCS D500
Product number	P-000 000	P-000 000	P-000 000	P-000 000	P-000 000	P-000 000
d 1	175 mm	225 mm	275 mm	325 mm	375 mm	475 mm
d 2	160 mm	210 mm	260 mm	310 mm	360 mm	460 mm
D	260 mm	310 mm	360 mm	410 mm	460 mm	560 mm
H	77 mm	98 mm	98 mm	98 mm	98 mm	98 mm
Clamping force	950 kN	950 kN	1 450 kN	1 450 kN	1 950 kN	2 500 kN
Max. allowed pressure	12 000 kN	15 000 kN	18 000 kN	21 000 kN	24 500 kN	30 000 kN
Max. allowed tension	400 kN	400 kN	600 kN	600 kN	800 kN	1000 kN
Mechanical fixing chuck plate	8 x M10	12 x M10	12 x M10	12 x M10	12 x M10	12 x M10
Pitch circle	235 mm	285 mm	335 mm	385 mm	435 mm	535 mm
Mechanical fixing clamping ring	8 x M12	12 x M12	12 x M16	12 x M16	16 x M16	20 x M16
Pitch circle	228 mm	278 mm	328 mm	378 mm	428 mm	528 mm
Weight	15 kg	27 kg	33 kg	39 kg	45 kg	65 kg

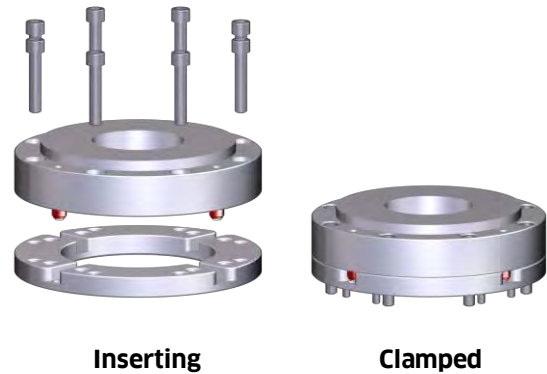
Manual Die Reference Clamping System MCS DM – Clamping of Different Die Designs and Sizes

The manual die clamping systems MCS DM 180/240, MCS DM 240/300 and MCS DM 290/350 can clamp dies in different designs and sizes.

Type A
Clamping of the die by bayonet – clamping ring

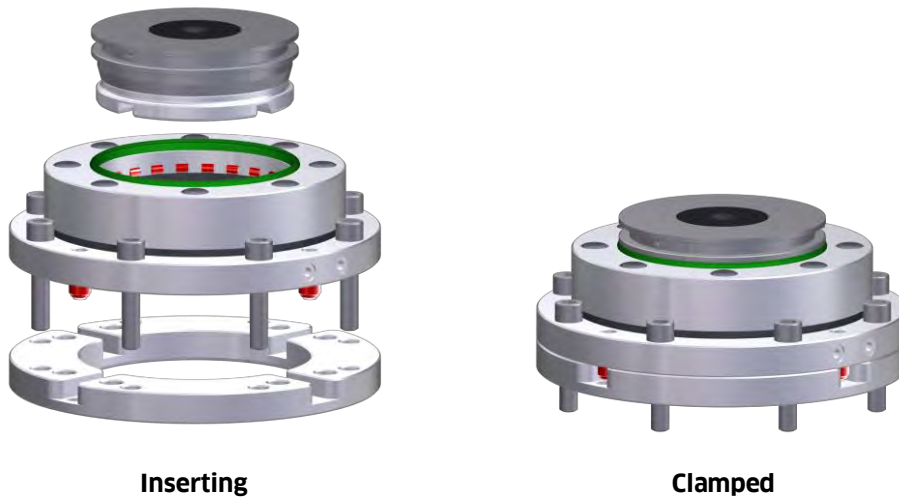


Type B
Clamping of the die directly by screws



With the help of an adaption the die can also be positioned clamped with the pneumatic clamping system RCS II.

Type C
Adaptation RCS II to MCS, clamping of the die by RCS II reference clamping system



MCS DM 180/240	Type A	Type B	Type C RCS II 135		
Die diameter	180 mm	240 mm	134 mm		
Clamping plate	P-004 121	P-004 121	P-004 121		
Clamping ring-bayonet	P-004 112	-	-		
Adaptation to RCS II	-	-	P-004 125		
MCS DM 250/310	Type A	Type B	Type C RCS II 135	Type C RCS II 180	
Die diameter	250 mm	310 mm	134 mm	180 mm	
Clamping plate	P-007 155	P-007 155	P-007 155	P-007 155	
Clamping ring-bayonet	P-007 161	-	-	-	
Adaptation to RCS II	-	-	P-000 000	P-007 157	
MCS DM 300/360	Type A	Type B	Type C RCS II 135	Type C RCS II 180	Type C RCS II 230
Die diameter	300 mm	360 mm	134 mm	180 mm	230 mm
Clamping plate	P-000 000	P-000 000	P-000 000	P-000 000	P-000 000
Clamping ring-bayonet	P-000 000	-	-	-	-
Adaptation to RCS II	-	-	P-000 000	P-000 000	P-000 000

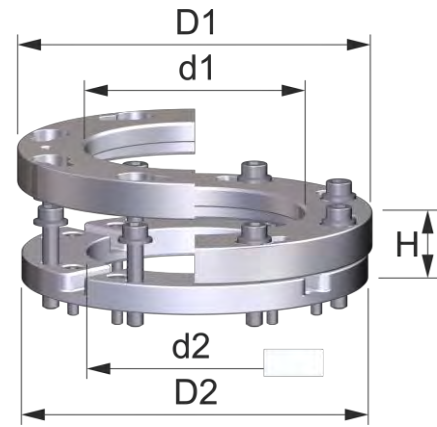
Manual Die Chuck MCS DM



INOX



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	590 kN
Max. allowed pressure	7 500 - 13 000 kN
Max. allowed tension	440 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Press and machine tools for manual clamping of dies or pneumatic clamping of RCS pallets in combination with the RCS II adaptation chucks.



Chuck	MCS DM 180/240	MCS DM 250/310	MCS DM 300/360
Clamping plate	P-004 121	P-007 155	P-000 000
Bayonet clamping ring	P-004 112	P-007 161	P-000 000
d 1	152 mm	222 mm	272 mm
d 2	150 mm	220 mm	270 mm
D1	246 mm	316 mm	366 mm
D2	240 mm	310 mm	360 mm
H	48 mm	48 mm	48 mm
Clamping force	590 kN	590 kN	590 kN
Max. allowed pressure	7 500 kN	10 500 kN	13 000 kN
Max. allowed tension	440 kN	440 kN	440 kN
Mechanical fixing clamping plate	8 x M8	8 x M10	8 x M10
Pitch circle	200 mm	270 mm	320 mm
Mechanical fixing clamping ring	8 x M12	8 x M12	8 x M12
Pitch circle	216 mm	286 mm	336 mm
Weight base plate	3,6 kg	6 kg	9 kg
Weight bayonet clamping ring	7,4 kg	12 kg	17 kg

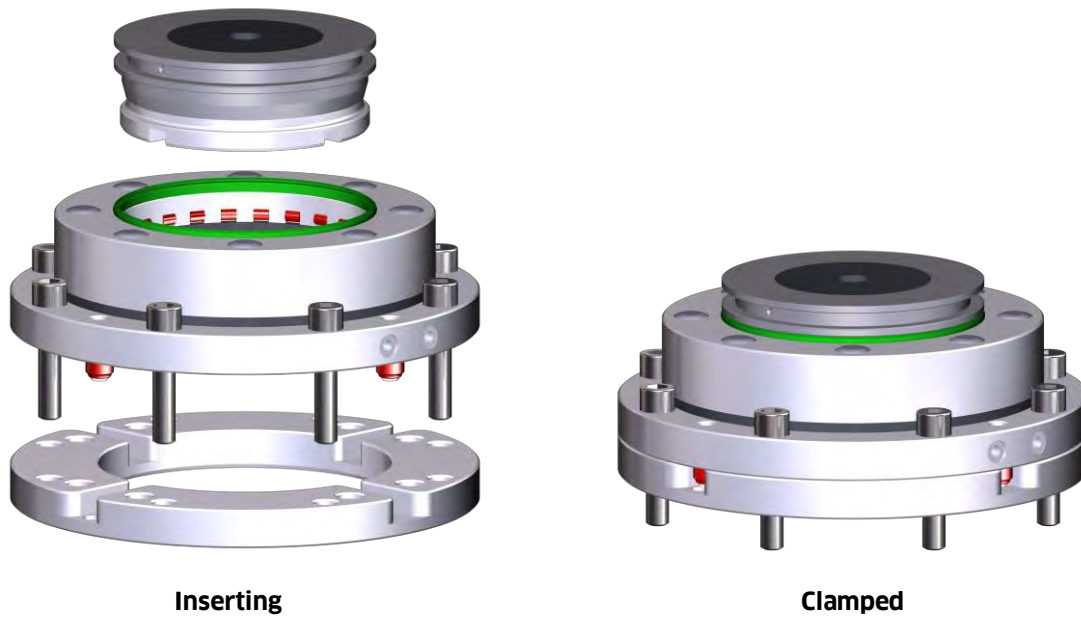
Locking Pin for Handling of Bayonet Clamping Ring

Locking pin	8 x 20
Product number	P-000 000
d x l	8 x 20
Weight	0,15 kg



Adaptation RCS II to MCS DM Pallet with SCS K Cones

Adaptation from manual MCS DM clamping system to pneumatic RCS II reference clamping system.



Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones

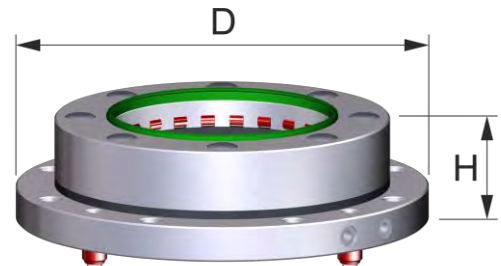


Chuck RCS II pneumatic

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force	25 000 - 44 500 N
Max. allowed pressure	1 200 - 3 800 kN
Max. allowed tension	120 - 200 kN
Air connection	Air supply manual radial. Air supply automatic through base chuck MCS DM.
Operation	Pneumatic control/support unit

Adaption basis pallet MCS DM with SCS K cones

Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in Chuck	MCS DM
Electronic identification	RFID optional
Application	RCS die and punch pallets clamped in RCS II chuck on MCS DM chuck.



Adaptation	MCS DM 180/240 RCS II 135	MCS DM 250/310 RCS II 180	MCS DM 300/360 RCS II 230
Product number	P-004 125	P-007 157	P-000 000
D	240 mm	310 mm	360 mm
H	60,5 mm	75 mm	75 mm
Clamping force 10 bar	25 000 N	36 000 N	44 500 N
Max. allowed pressure	1 200 kN	2 500 kN	3 800 kN
Max. allowed tension	120 kN	160 kN	200 kN
Mechanical fixing	8 x M12	8 x M12	12 x M12
Pitch circle	216 mm	286 mm	356 mm
Weight	10,2 kg	17 kg	19,5 kg

Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones

Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones

Operation	Manual
Function	Manipulation of adaption RCS II on MCS DM
Material	Steel stainless, aluminium, with locking pin



Manipulation fixture	MCS DM 180/240 RCS II 135	MCS DM 250/310 RCS II 180	MCS DM 300/360 RCS II 230
Product number	P-004 998	P-000 000	P-000 000
Weight	0,5 kg	0,75 kg	1 kg

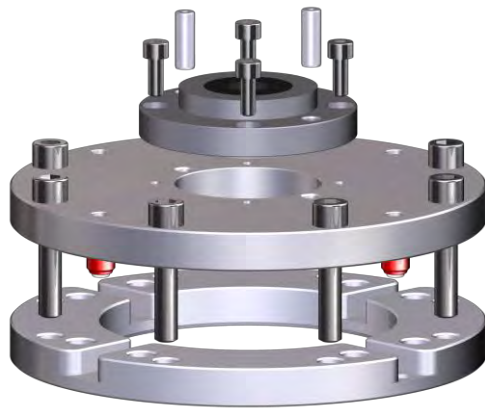
Locking Pin for Manipulation Fixture for Adaptation RCS II Chuck to MCS DM Pallet with SCS K Cones

Locking pin	8 x 20
Product number	P-000 000
d x l	8 x 20
Weight	0,15 kg

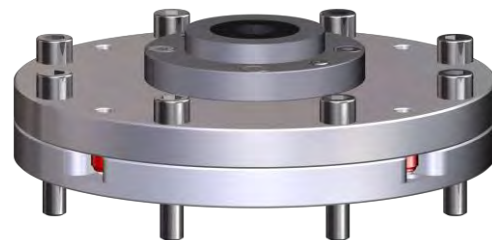


Adaptation for Refix° to MCS DM Pallet with SCS K Cones

Adaptation of manual MCS DM clamping system to manual Refix° clamping system.



Inserting



Clamped

Adaptation for Refix° Clamping System to MCS DM Pallet with SCS K Cones

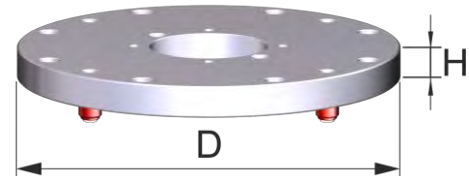


Chuck for Refix° manual

Material	Steel hardened stainless
Positioning system	Refix°
Clamping force	- N
Max. allowed pressure	- kN
Max. allowed tension	- kN
Air connection	None, manual clamping
Operation	None, manual clamping

Adaption basis pallet MCS DM with SCS K cones

Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in chuck	MCS DM
Electronic identification	RFID optional
Application	Refix° die clamped in MCS chuck.



Adaptation	MCS DM 180/240 for Refix° 44/46	MCS DM 180/240 for Refix° 45/45	MCS DM 250/310 for Refix° 44/46	MCS DM 250/310 for Refix° 45/45
Product number	P-000 000	P-004 127	P-000 000	P-000 000
Refix°	44/46	45/45	44/46	45/45
D	240 mm	240 mm	310 mm	310 mm
H	20 mm	20 mm	22 mm	22 mm
Clamping force	- N	- N	- N	- N
Max. allowed pressure	- kN	- kN	- kN	- kN
Max. allowed tension	- kN	- kN	- kN	- kN
Mechanical fixing	8 x M12	8 x M12	8 x M12	8 x M12
Pitch circle	216 mm	216 mm	286 mm	286 mm
Weight	5 kg	5 kg	8,5 kg	8,5 kg

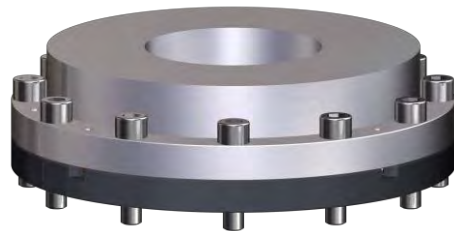
Manual Punch Clamping System MCS PR, MCS PT and MCS PM for Single and Multi Level Application

There are a variety of designs for the manual referenced clamping of one or more punches. The clamping primarily works by screws with or without bayonet clamping ring. The positioning is done by the positioning system Cone SCS K with a positioning accuracy of $\pm 0,001$ mm. The high compaction forces will be hold by scalable ZO faces of the MCS clamping systems.

MCS PR for clamping of one punch size

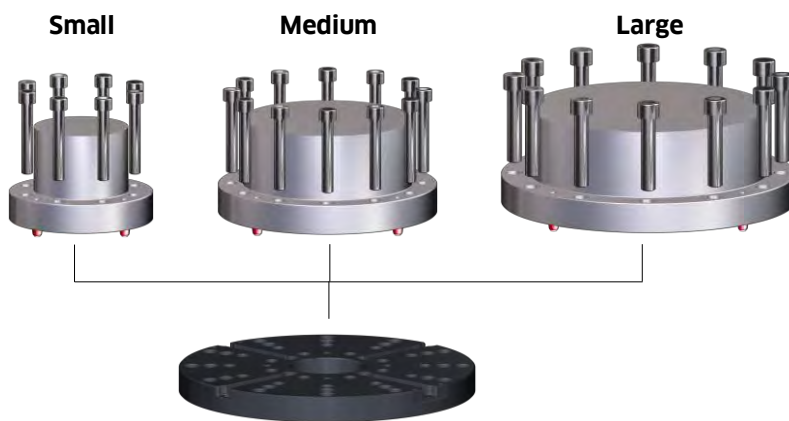


Inserting

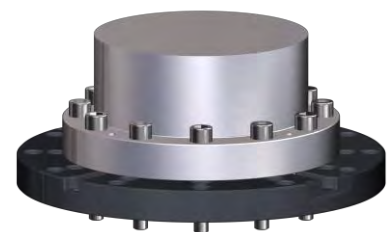


Clamped

MCS PM for clamping of three punch sizes – small / medium / large



Inserting

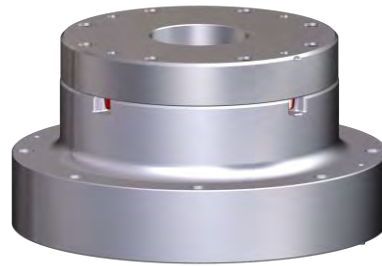


Clamped (Size Medium)

MCS PT for multi level application



Inserting



Clamped

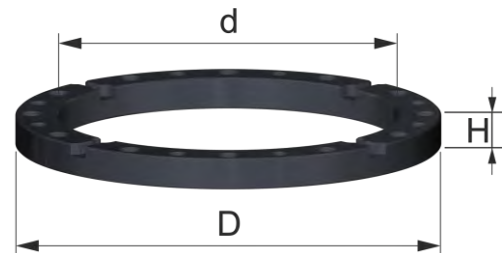


MCS PT combination
for multi level application

Manual Punch Clamping System MCS PR



Material	Steel hardened stainless ADLC coated optional
Positioning system	Cone SCS K
Clamping force	2 000 - 4 000 kN
Max. allowed pressure	1 500 - 4 300 kN
Max. allowed tension	140 - 280 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Press and machine tool for manual clamping of punches.



Sizes compaction line I : MCS PR105 / MCS PR155 / MCS PR205

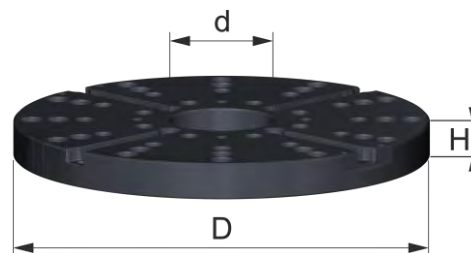
Sizes compaction line II : MCS PR125 / MCS PR175 / MCS PR225

Punch chuck	MCS PR105	MCS PR125	MCS PR155	MCS PR175	MCS PR205	MCS PR225
Product number	P-000 000	P-000 000	P-000 000	P-000 00	P-000 000	P-000 000
d	65 mm	85 mm	110 mm	130 mm	160 mm	180 mm
D	105 mm	125 mm	155 mm	175 mm	205 mm	225 mm
H	30 mm	30 mm	30 mm	30 mm	30 mm	30 mm
Clamping force	2 000 kN	2 000 kN	3 000 kN	3 000 kN	4 000 kN	4 000 kN
Max. allowed pressure	1 400 kN	1 800 kN	2 750 kN	3 250 kN	4 000 kN	4 500 kN
Max. allowed tension	140 kN	140 kN	210 kN	210 kN	280 kN	280 kN
Mechanical fixing	4 x M10	4 x M10	6 x M10	6 x M10	8 x M10	8 x M10
Pitch circle	85 mm	105 mm	125 mm	155 mm	185 mm	205 mm
Weight	0,75 kg	1 kg	1,3 kg	1,7 kg	2,2 kg	2,8 kg

Manual Punch Clamping System MCS PM



Material	Steel hardened stainless ADLC coated optional
Positioning system	Cone SCS K
Clamping force	1 100 - 2 600 kN
Max. allowed pressure	30 000 - 54 000 kN
Max. allowed tension	750 - 1 750 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Press and machine tool for manual clamping of punches.



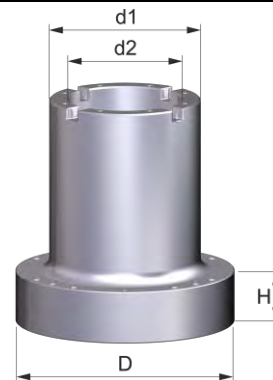
Punch chuck	MCS PM200/300/400	MCS PM300/400/500
Product number	P-003 736	P-000 000
d	100 (0*) mm	100 (0*) mm
D	400 mm	500 mm
H	35 mm	35 mm
Clamping force	1 100 - 2 600 kN	1 100 - 2 600 kN
Max. allowed pressure	30 000 kN	54 000 kN
Max. allowed tension	750 - 1 750 kN	750 - 1 750 kN
Mechanical fixing chuck	12 x M12	12 x M12
Pitch circle	310 mm	410 mm
Weight	17,5 kg	25 kg

*Top punch chuck without through hole. d = 0 mm

Manual Punch Clamping System MCS PT



Material	Steel hardened stainless ADLC coated optional
Positioning system	Cone SCS K
Clamping force	250 kN
Max. allowed pressure	1 400 - 4 500 kN
Max. allowed tension	180 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Press and machine tool for manual clamping of punches.

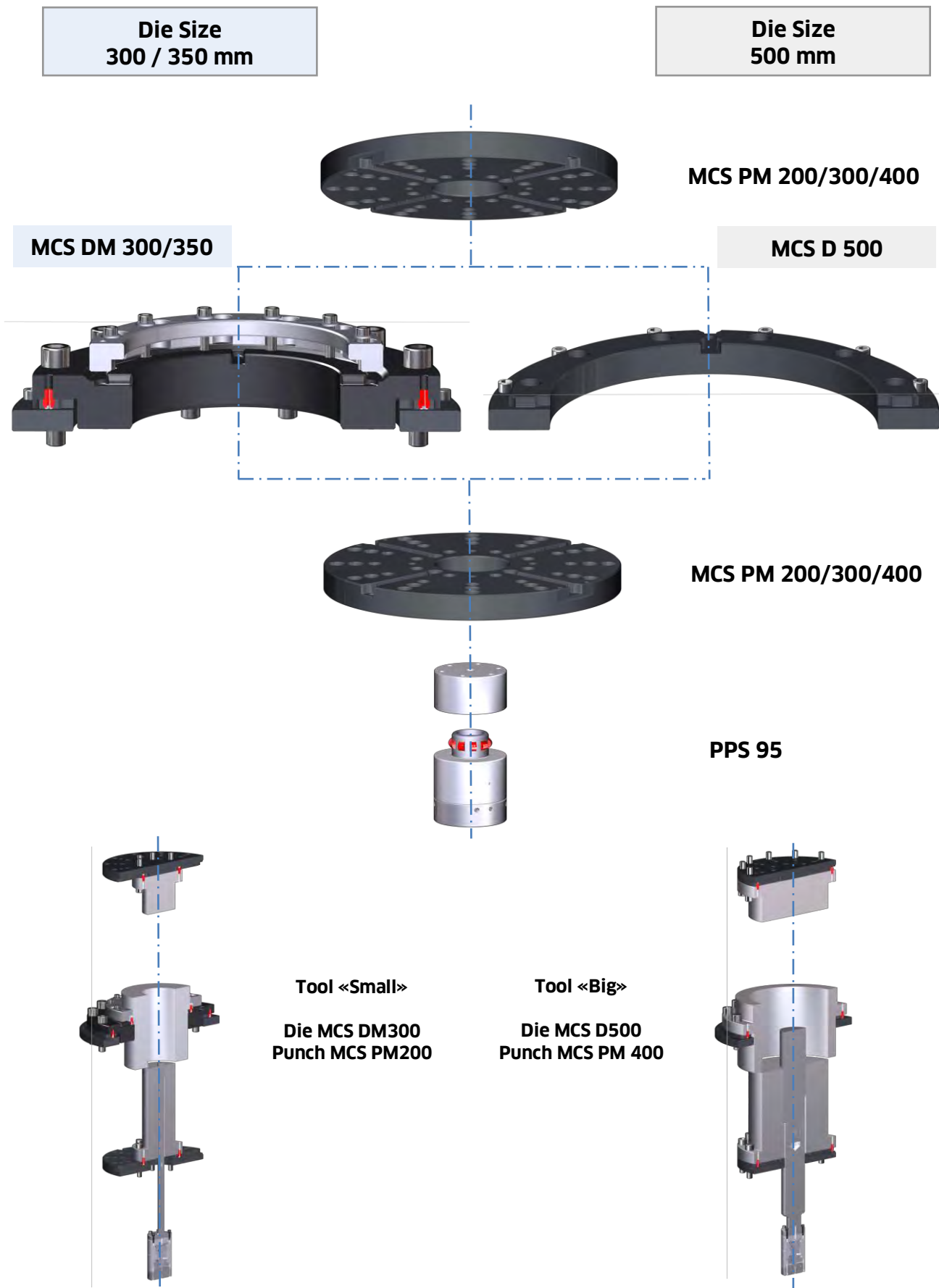


Sizes compaction line I : MCS PT105 / MCS PT155 / MCS PT205

Sizes compaction line II : MCS PT125 / MCS PT175 / MCS PT225

Punch chuck	MCS PT105	MCS PT125	MCS PT155	MCS PT175	MCS PT205	MCS PT225
Product number	P-000 000	P-000 000	P-000 000	P-000 00	P-000 000	P-000 000
d 1	105 mm	125 mm	155 mm	175 mm	205 mm	225 mm
d 2	65 mm	85 mm	110 mm	130 mm	160 mm	180 mm
D	165 mm	185 mm	215 mm	250 mm	280 mm	300 mm
H	60 mm	60 mm	60 mm	60 mm	60 mm	60 mm
Clamping force	250 kN	250 kN	250 kN	250 kN	250 kN	250 kN
Max. allowed pressure	1 400 kN	1 800 kN	2 750 kN	3 250 kN	4 000 kN	4 500 kN
Max. allowed tension	180 kN	180 kN	180 kN	180 kN	180 kN	180 kN
Mechanical fixing chuck	8 x M10	10 x M10	10 x M10	12 x M10	12 x M10	8 x M12
Pitch circle	140 mm	160 mm	190 mm	230 mm	260 mm	278 mm
Weight	7,2 kg	8,1 kg	9,2 kg	10 kg	12,8 kg	13,6 kg

Single-Level-Application for Compaction of Iron and Tungsten Carbide Powder up to 1000 Tons Compaction Force



Multi-Level-Application for Compaction of Iron Powder up to 300 Tons Compaction Force

Die Size 250 mm
Max. Compaction Force 150 Tons

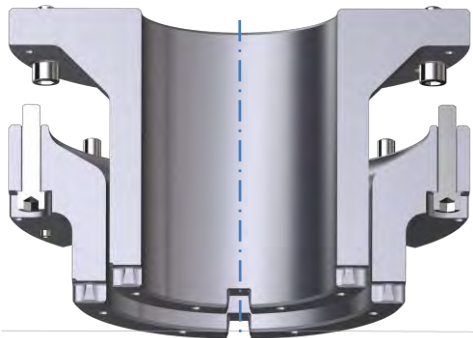
Die Size 300 mm
Max. Compaction Force 300 Tons

MCS PT155

MCS PT175

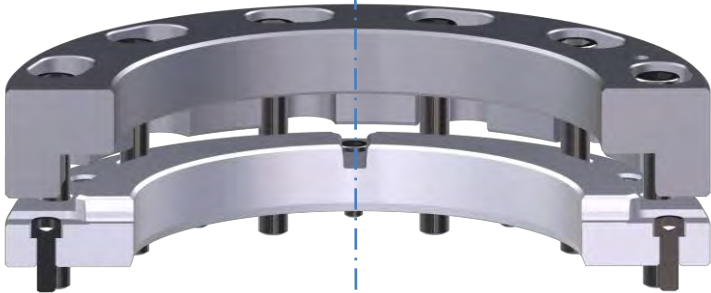
MCS PT205

MCS PT225



MCS D250
Bayonet
Clamping
Ring

MCS D300
Bayonet
Clamping
Ring



MCS PT205

MCS PT225

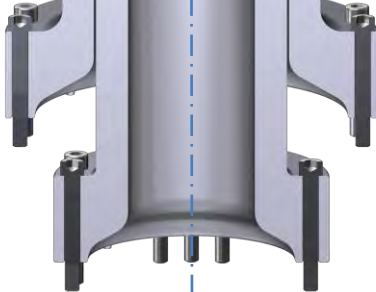


MCS PT155

MCS PT175

MCS PT105

MCS PT125



PPS 60

PPS 80



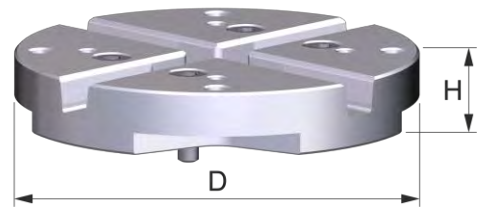
Manual Chuck MCS E



INOX



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	120 kN
Max. allowed pressure	- kN
Max. allowed tension	60 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Machine tool for manual clamping of tools and work pieces.

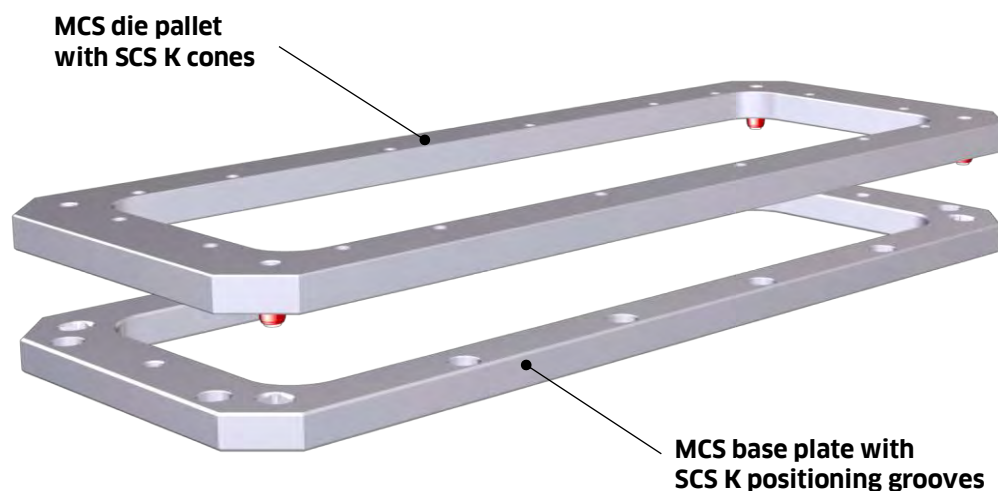


Chuck	MCS E150	MCS E200	MCS E150 Bayonet ring	MCS E200 Bayonet ring
Product number	P-005 111	P-000 000	P-000 000	P-000 000
D	150 mm	200 mm	150 mm	200 mm
H	25 mm	25 mm	25 mm	25 mm
Clamping force	120 kN	120 kN	120 kN	120 kN
Max. allowed pressure	- kN	- kN	- kN	- kN
Max. allowed tension	60 kN	60 kN	60 kN	60 kN
Mechanical fixing clamping plate	4 x M8	4 x M8	4 x M8	4 x M8
Pitch circle	70 x 40 mm	120 x 90 mm	70 x 40 mm	120 x 90 mm
Mechanical fixing work piece / tool	4 x M8	4 x M8	4 x M8	4 x M8
Pitch circle	130 mm	180 mm	130 mm	180 mm
Weight	2,7 kg	4,6 kg	1 kg	1,8 kg

MCS Reference Clamping System for any Shapes

The great advantage of the MCS reference clamping systems is that both, the positioning cone SCS K as well as the clamping screws, can be arranged as desired. Thus, the MCS system is determined not only on round shapes, it could be defined and built for any shapes.

Example of a manual rectangular MCS reference clamping system with the positioning cone SCS K for dies:



MCS Chuck and Alignment Pallets for Tool Shop

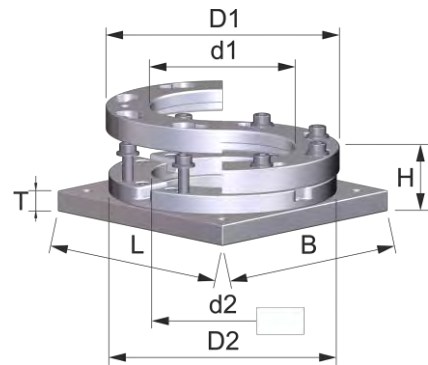
Manual Die Chuck MCS DM on Base Plate



INOX



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	590 kN
Max. allowed pressure	7 500 - 13 000 kN
Max. allowed tension	440 kN
Air connection	None, manual clamping
Operation	None, manual clamping
Application	Machine tools and measurement machine for manual clamping of dies.



Chuck	MCS DM 180/240	MCS DM 250/310	MCS DM 300/360
Base plate	P-004 106	P-000 000	P-000 000
Clamping positioning plate	P-004 121	P-007 155	P-000 000
Bayonet clamping ring	P-004 112	P-007 161	P-000 000
d 1	152 mm	222 mm	272 mm
d 2	150 mm	220 mm	270 mm
D1	246 mm	316 mm	366 mm
D2	240 mm	310 mm	360 mm
H	72 mm	74 mm	76 mm
T	24 mm	26 mm	28 mm
L x B	250 x 250 mm	310 x 310 mm	370 x 370 mm
Clamping force	590 kN	590 kN	590 kN
Max. allowed pressure	7 500 kN	10 500 kN	13 000 kN
Max. allowed tension	440 kN	440 kN	440 kN
Mechanical fixing base plate	4 x M8	4 x M8	4 x M8
Mechanical fixing clamping ring	8 x M12	8 x M12	8 x M12
Pitch circle	216 mm	286 mm	336 mm
Weight	13,5 / 10,7 kg	20,2 / 14,9 kg	30 / 20 kg

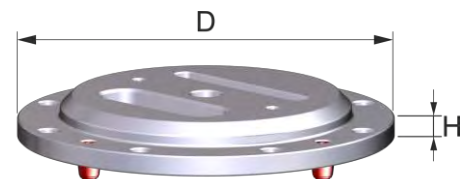
Alignment Pallet MCS DM PA



INOX



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in Chuck	MCS DM
Application	Alignment and referencing of chuck on machine tool and measurement machine.



Alignment pallet	MCS DM PA 180/240	MCS DM PA 250/310	MCS DM PA 300/360
Product number	P-004 140	P-000 000	P-000 000
D	240 mm	300 mm	350 mm
H	28 mm	28 mm	28 mm
Weight	5,5 kg	8 kg	13 kg

Locking Pin for Handling of Bayonet Clamping Ring

Locking pin	8 x 20
Product number	P-000 000
d x l	8 x 20
Weight	0,15 kg



MCS C Changeable Plate System



Manual Changeable Plate System for Die Clamping Systems and Multi Axial Compaction Tool Systems – Cross hole, Closed Die, Opened Die and Splitted Die

Modular design

Adaptation to different die geometries and compressive and tensile forces is possible.

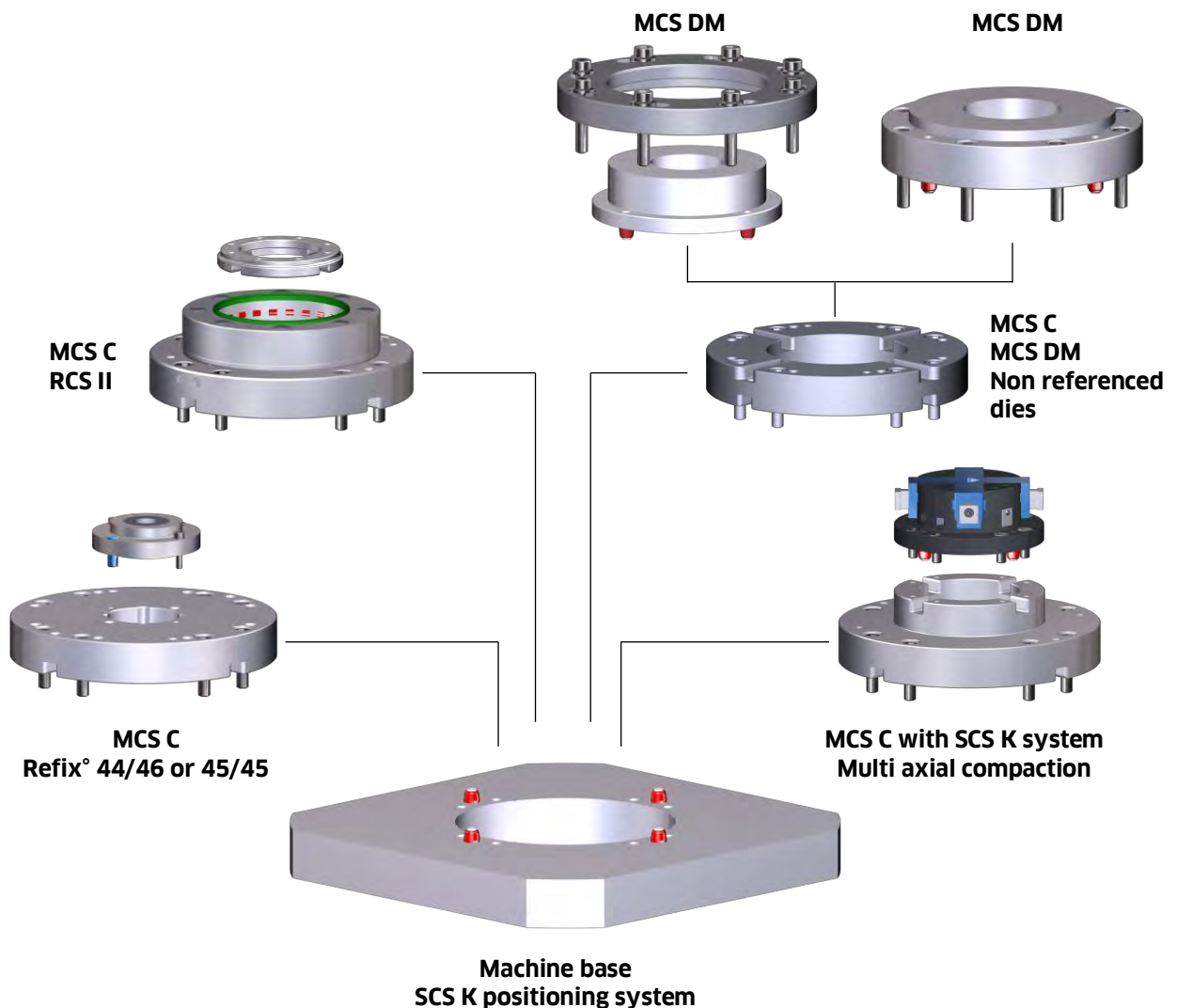
Scaling

Different sizes cover the requirements of compaction tools and the compaction process.

Operation

The changeable plates will be screwed manual direct in the die plates of the press. The positioning is done by SCS K cones and ground grooves. Usage for coaxial and multiaxial compaction in combination with highest compression and tensile forces.

The manual changeable plate system MCS C is used for quick high-precision positioned alternation of different die plates. The die plates MCS C are available on the topside with different mechanical interfaces and positioning systems and thus guarantee the maximum of operational flexibility of the press.



MCS C260 Changeable Plate	MCS C260 RCS II 135	MCS C260 MCS DM 180/200/260	MCS C260 for Refix° 44/46	MCS C260 for Refix° 45/45	MCS C260 Multi Axial Compaction
Changeable plate D x H	260 x 40 mm	260 x 40 mm	260 x 40 mm	260 x 40 mm	260 x 40 mm
Die diameter	134 mm	180/200/260 mm-	-	-	max. 260 mm
MCS C260 Changeable plate	P-004 132	P-004 134	P-004 181	P-007 106	P-007 128
Bayonet clamping ring	-	P-004 189	-	-	-

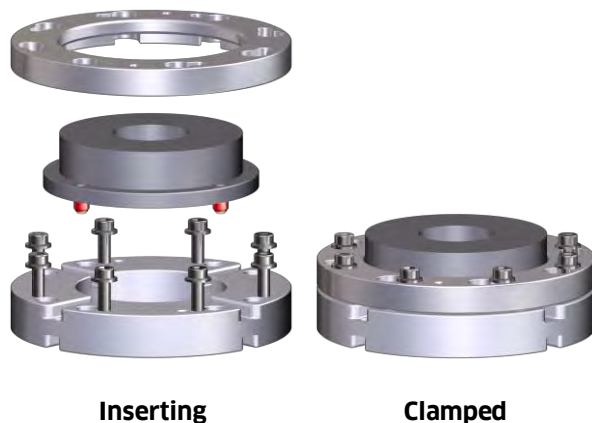
MCS C310 Changeable Plate	MCS C310 RCS II 135	MCS C310 RCS II 180	MCS C310 MCS DM 230/250/310	MCS C310 for Refix° 44/46	MCS C310 for Refix° 45/45
Changeable plate D x H	310 x 40 mm	310 x 40 mm	310 x 40 mm	310 x 40 mm	310 x 40 mm
Die diameter	134 mm	180 mm	230/250/310 mm-	-	-
MCS C310 Changeable plate	P-008 310	P-008 315	P-008 312	P-000 000	P-000 000
Bayonet clamping ring	-	-	P-008 314	-	-

In addition to the shown standard versions of the MCS C changeable plate system there are also changeable plates with customized interface on topside available.

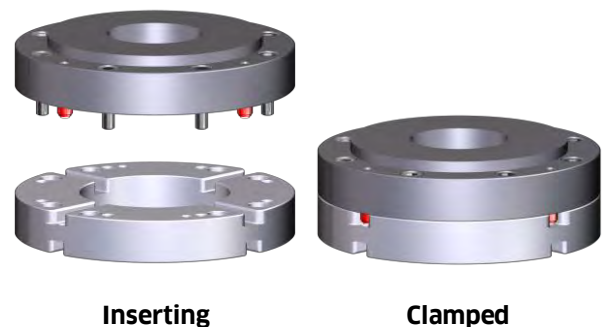
MCS C Changeable Plate with MCS DM and Clamping of Non Referenced Dies (Existing Dies)

The MCS C changeable plate may carry dies of different size and shape in a referenced and non referenced position.

Type A
Clamping of the die by bayonet – clamping ring

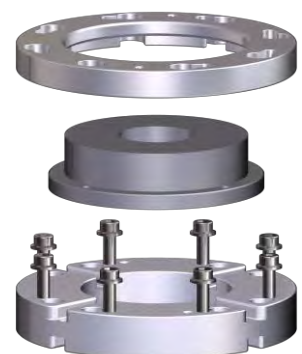


Type B
Clamping of the die directly by screws



Existing dies will be clamped by a bayonet ring (Type A) without the reference system SCS K on the MCS C changeable plate.

**Non referenced dies
(Existing dies)**



MCS C Changeable Plate with MCS DM



INOX

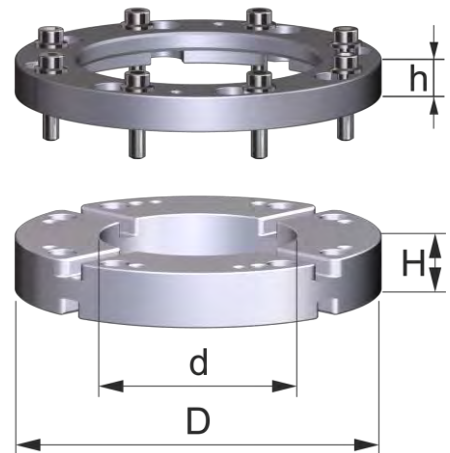


Chuck MCS

Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	590 kN
Max. allowed pressure	13 000 - 17 000 kN
Max. allowed tension	415 kN
Air connection	None, manual clamping
Operation	None, manual clamping

Adaption basis MCS C changeable plate with SCS K grooves

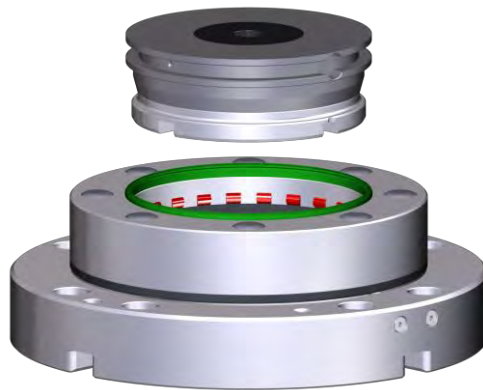
Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in chuck	MCS C
Electronic identification	RFID optional
Application	Press for manual clamping of dies with and without SCS K positioning system.



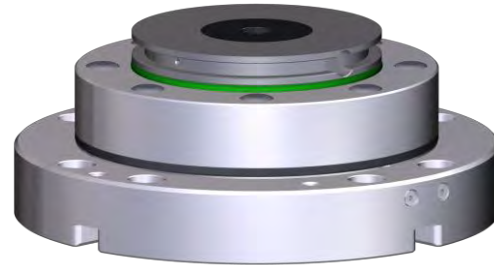
MCS C changeable Plate	MCS C260	MCS C310
Product number	P-004 134	P-000 000
Bayonet clamping ring	MCS DM 180/200	MCS DM 230/250
Product number	P-004 189	P-000 000
d	140 mm	190 mm
D	260 mm	310 mm
h	26 mm	26 mm
H	40 mm	40 mm
Clamping force	590 kN	590 kN
Max. allowed pressure	13 000 kN	17 000 kN
Max. allowed tension	415 kN	415 kN
Mechanical fixing changeable plate	8 x M12	8 x M12
Pitch circle	226 mm	276 mm
Mechanical fixing clamping ring	8 x M12	8 x M12
Pitch circle	226 mm	276 mm
Weight changeable plate	10,5 kg	12,5 kg
Weight bayonet clamping ring	3,9 kg	5,5 kg

MCS C Changeable Plate with RCS II

MCS C changeable Plate with pneumatic RCS II for referenced clamping of palletized dies.



Inserting



Clamped

MCS C changeable plate with RCS II

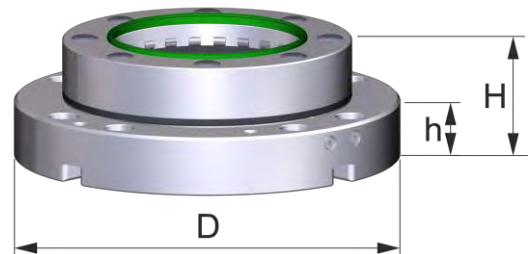


Chuck RCS II

Material	Steel hardened stainless
Positioning system	Prism Power P
Clamping force 10 bar	25 000 - 36 000 N
Max. allowed pressure	1 200 - 2 500 kN
Max. allowed tension	120 - 160 kN
Air connection	Air supply manual radial. Air supply automatic through changeable plate MCS C.
Operation	Pneumatic control and support unit

Adaption basis MCS C changeable plate with SCS K grooves

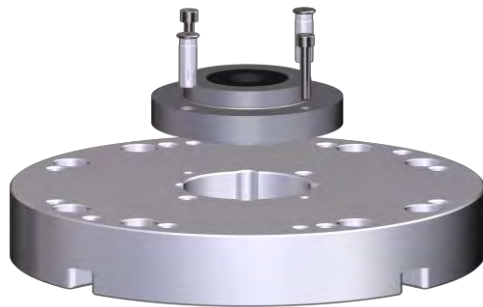
Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in chuck	MCS C
Electronic identification	RFID optional
Application	Press for pneumatic clamping of dies.



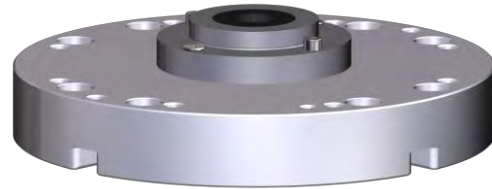
MCS C changeable Plate with RCS II	MCS C260 RCS II 135	MCS C310 RCS II 135	MCS C310 RCS II 180	MCS C360 RCS II 230
Product number	P-004 132	P-008 310	P-008 315	P-000 000
D	260 mm	310 mm	310 mm	360 mm
h	40 mm	40 mm	40 mm	40 mm
H	80 mm	80 mm	90 mm	90 mm
Clamping force	25 000 N	25 000 N	36 000 N	44 500 N
Max. allowed pressure	1 200 kN	1 200 kN	2 500 kN	4 500 kN
Max. allowed tension	120 kN	120 kN	160 kN	200 kN
Mechanical fixing changeable plate	8 x M12	8 x M12	8 x M12	8 x M12
Pitch circle	226 mm	276 mm	276 mm	334 mm
Weight	16 kg	18 kg	19 kg	25 kg

MCS C260 Changeable Plate with Refix° Holes

MCS C260 changeable plate for referenced clamping of dies with Refix° positioning system.



Inserting



Clamped

MCS C Changeable Plate with Refix° Holes

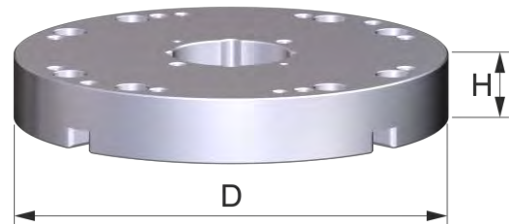


Chuck for Refix° manual

Material	Steel hardened stainless
Positioning system	Refix°
Clamping force	- N
Max. allowed pressure	- kN
Max. allowed tension	- kN
Air connection	None, manual clamping
Operation	None, manual clamping

Adaption basis MCS C changeable plate with SCS K grooves

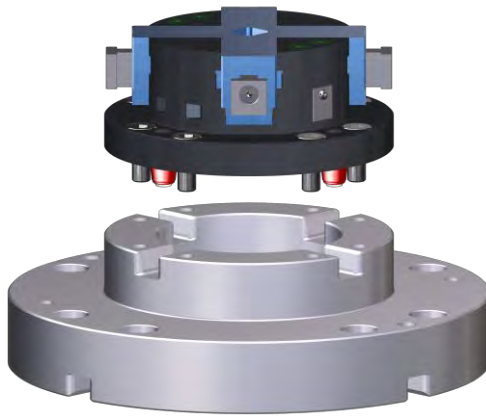
Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in chuck	MCS C
Electronic identification	RFID optional
Application	Press for pneumatic clamping of dies with Refix° positioning system.



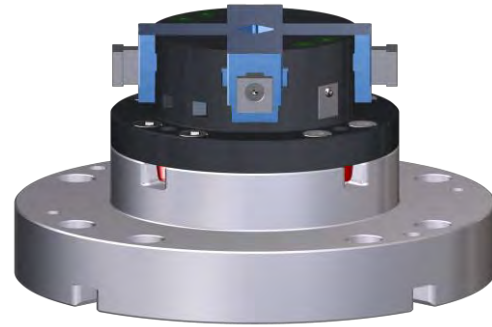
MCS C changeable plate for Refix°	MCS C260 for Refix° 44/46	MCS C260 for Refix° 45/45	MCS C310 for Refix° 44/46	MCS C310 for Refix° 45/45
Product number	P-004 181	P-007 106	P-000 000	P-007 147
Refix°	44/46	45/45	44/46	45/45
D	260 mm	260 mm	310 mm	310 mm
H	40 mm	40 mm	40 mm	40 mm
Clamping force	- N	- N	- N	- N
Max. allowed pressure	- kN	- kN	- kN	- kN
Max. allowed tension	- kN	- kN	- kN	- kN
Mechanical fixing changeable plate	8 x M12	8 x M12	8 x M12	8 x M12
Pitch circle	226 mm	226 mm	276 mm	276 mm
Weight	12 kg	12 kg	15 kg	15 kg

MCS C260 Changeable Plate with SCS K System for Multi Axial Compaction

MCS C260 changeable plate for referenced clamping of dies for multi axial compaction.



Inserting



Clamped

MCS C Changeable Plate with MCS for Multi Axial Compaction



INOX

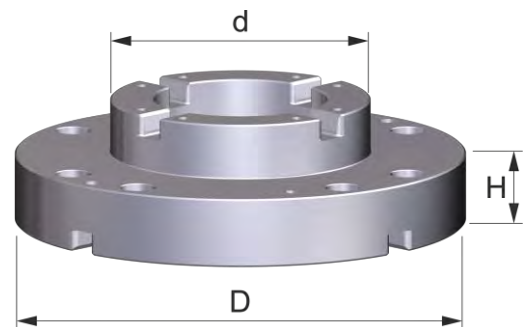


Chuck MCS

Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	400 kN
Max. allowed pressure	6 500 kN
Max. allowed tension	285 kN
Air connection	None, manual clamping
Operation	None, manual clamping

Adaption basis MCS C changeable plate with SCS K grooves

Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping in chuck	MCS C
Electronic identification	RFID optional
Application	Press for manual clamping of dies for multi axial compaction.



MCS C changeable plate with MCS	MCS C260 MCS MA175	MCS C310 MCS MA175
Product number	P-007 189	P-000 000
d	175 mm	175 mm
D	260 mm	310 mm
H	40 mm	40 mm
Clamping force	400 kN	400 kN
Max. allowed pressure	6 500 kN	6 500 kN
Max. allowed tension	285 kN	285 kN
Mechanical fixing changeable plate	8 x M12	8 x M12
Pitch circle	226 mm	276 mm
Weight	13,5 kg	16,5 kg

Manipulation Fixtures for MCS C Changeable Plate

Manipulation Fixture for MCS C Changeable Plate

Operation	Manual
Function	Manipulation of changeable plate MCS C
Material	Steel stainless, aluminium, with locking pin



Manipulation fixture for MCS C changeable plate	MCS C260	MCS C310	MCS C360
Product number	P-004 995	P-008 320	P-000 000
Weight	0,75 kg	1 kg	1,2 kg

Locking Pin for Manipulation Fixture for MCS C Changeable Plate

Locking pin	8 x 20
Product number	P-000 000
d x l	8 x 20
Weight	0,15 kg



SCS Segmented Clamping System

Reference clamping system for clamping of punch, punch carriers and dies



Modular design

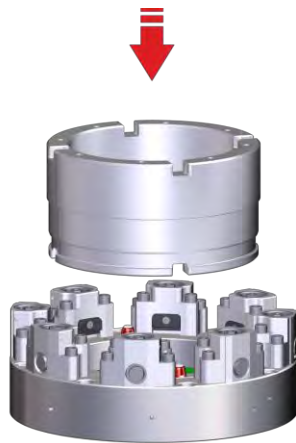
Adaptation to different punch and die geometries and compressive and tensile forces is possible.

Scaling

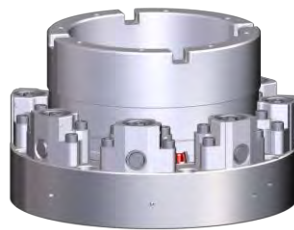
Different sizes cover the requirements of compaction tools and the compaction process. Usage for co axial compaction processes with highest compressive and tensile forces.

Operation

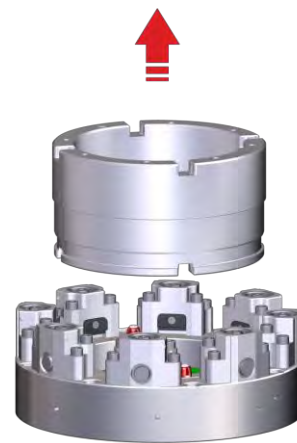
Chuck will be opened by compressed air and afterwards the pallet can be inserted. After unpressurizing the chuck, the pallet will be clamped by a spring activated clamping mechanism. To unclamp the pallet the chuck must be opened by compressed air.



Inserting



Clamped



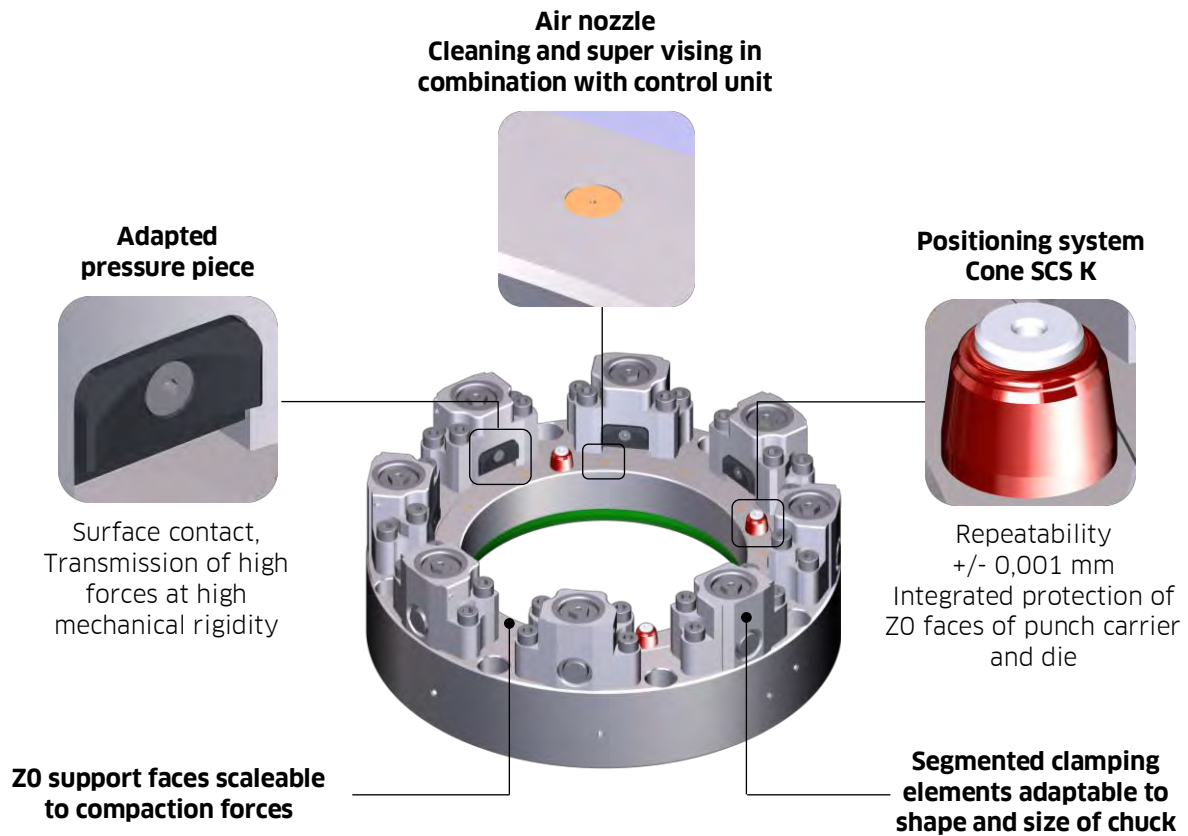
Opening

Technical Data

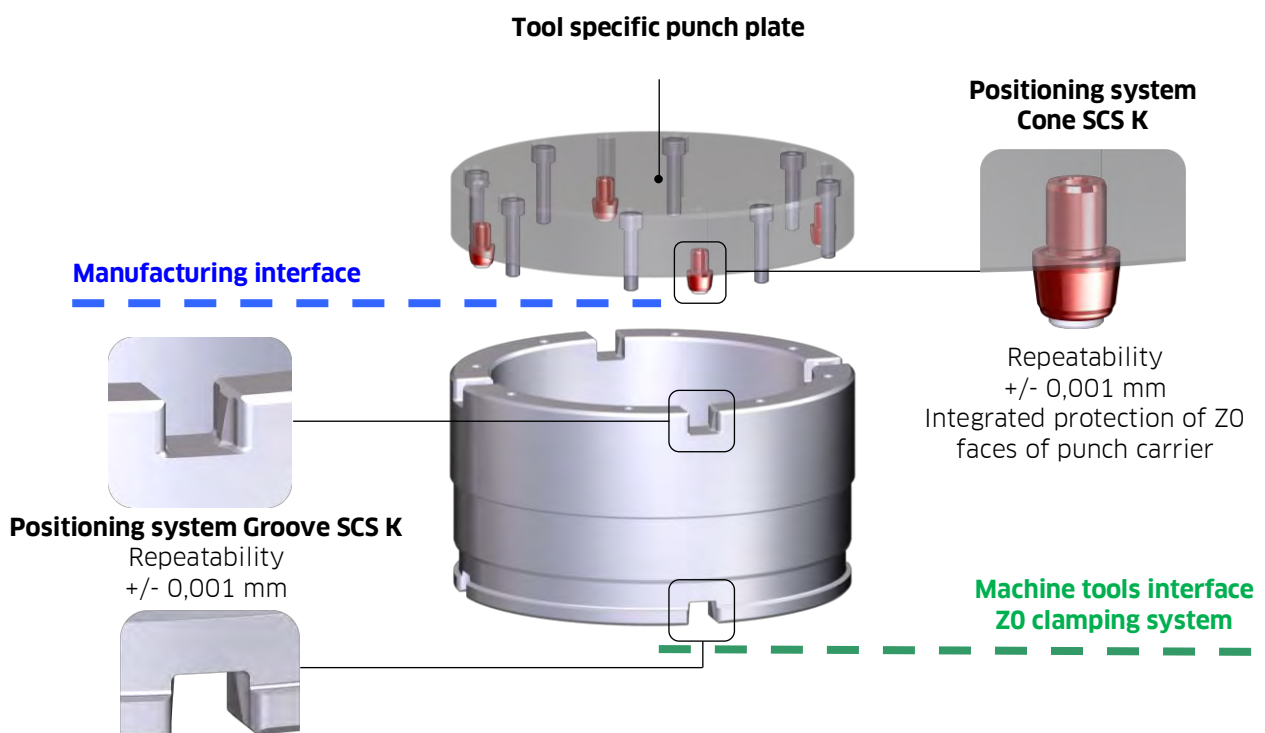
Positioning system	Cone SCS K
Repeatability X/Y	+/- 0,001mm (3 σ value)
Repeatability Z	+/- 0,001mm (3 σ value)
Indexing	4 x 90°
Clamping	Spring force
Opening	Compressed air 10 bar
Clamping force	2 500 - 10 000 N
Max. allowed pressure	700 - 7 000 kN
Max. allowed tension	120 - 480 kN



Basic Principle SCS Chuck



Basic Principle SCS Punch Carrier and Punch Plate

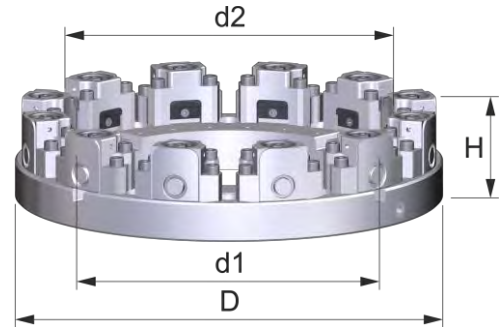


Die Chuck SCS D



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	2 500 - 10 000 N
Max. allowed pressure	2 000 - 7 000 kN
Max. allowed tension	120 - 480 kN
Air connection	Opening 10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Application	Press and machine tools for clamping of die.

Chuck is shown without cover, housing and seal.

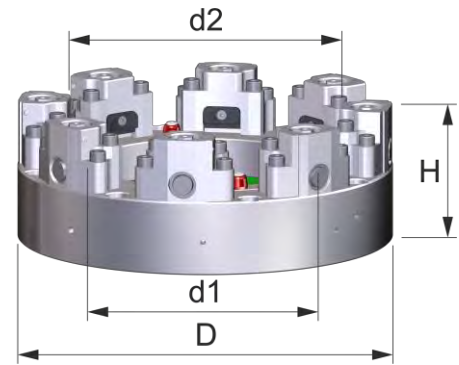


Chuck	SCS D200	SCS D250	SCS D300	SCS D350	SCS D400
Product number	P-000 000	P-000 000	P-000 000	P-000 000	P-000 000
d 1	155 mm	205 mm	255 mm	305 mm	355 mm
d 2	200 mm	250 mm	300 mm	350 mm	400 mm
D	285 mm	335 mm	385 mm	435 mm	485 mm
H	85 mm	85 mm	85 mm	85 mm	85 mm
Clamping segment	8	12	12	16	16
Clamping force	5 000 N	7 500 N	7 500 N	10 000 N	10 000 N
Max. allowed pressure	3 000 kN	4 000 kN	5 000 kN	6 000 kN	7 000 kN
Max. allowed tension	240 kN	360 kN	360 kN	480 kN	480 kN
Mechanical fixing	8 x M10	12 x M10	12 x M10	16 x M10	16 x M10
Pitch circle	226 mm	276 mm	326 mm	376 mm	426 mm
Weight	12 kg	17,1 kg	18,9 kg	23,9 kg	25,7 kg

Punch Chuck SCS P



Material	Steel hardened stainless
Positioning system	Cone SCS K
Clamping force	2 500 – 5 000 kN
Max. allowed pressure	700 – 2 400 kN
Max. allowed tension	120 – 240 kN
Air connection	Opening 10 bar, cleaning and supervising 1 bar
Operation	Pneumatic control and support unit
Application	Press and machine tools for clamping of punch and punch carrier.



Chuck is shown without cover, housing and seal.

Sizes compaction line I : SCS P105 / SCS P155 / SCS P205

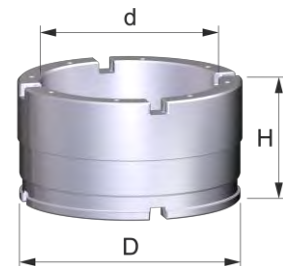
Sizes compaction line II : SCS P125 / SCS P175 / SCS P225

Punch chuck	SCS P105	SCS P125	SCS P155	SCS P175	SCS P205	SCS P225
Product number	P-000 000	P-000 000	P-000 000	P-000 00	P-000 000	P-000 000
d 1	63 mm	83 mm	108 mm	133 mm	160 mm	180 mm
d 2	105 mm	125 mm	155 mm	175 mm	205 mm	225 mm
D	185 mm	205 mm	235 mm	255 mm	285 mm	305 mm
H	90 mm	90 mm	90 mm	90 mm	90 mm	90 mm
Clamping segment	4	4	4	4	8	8
Clamping force	2 500 N	2 500 N	2 500 N	2 500 N	5 000 N	5 000 N
Max. allowed pressure	700 kN	950 kN	1 550 kN	1550 kN	2 100 kN	2 400 kN
Max. allowed tension	120 kN	120 kN	120 kN	120 kN	240 kN	240 kN
Mechanical fixing	4 x M10	4 x M10	4 x M10	4 x M10	8 x M10	8 x M10
Pitch circle	160 mm	180 mm	210 mm	230 mm	260 mm	280 mm
Weight	7,2 kg	8,1 kg	9,2 kg	10 kg	12,8 kg	13,6 kg

Punch Carrier SCS PT



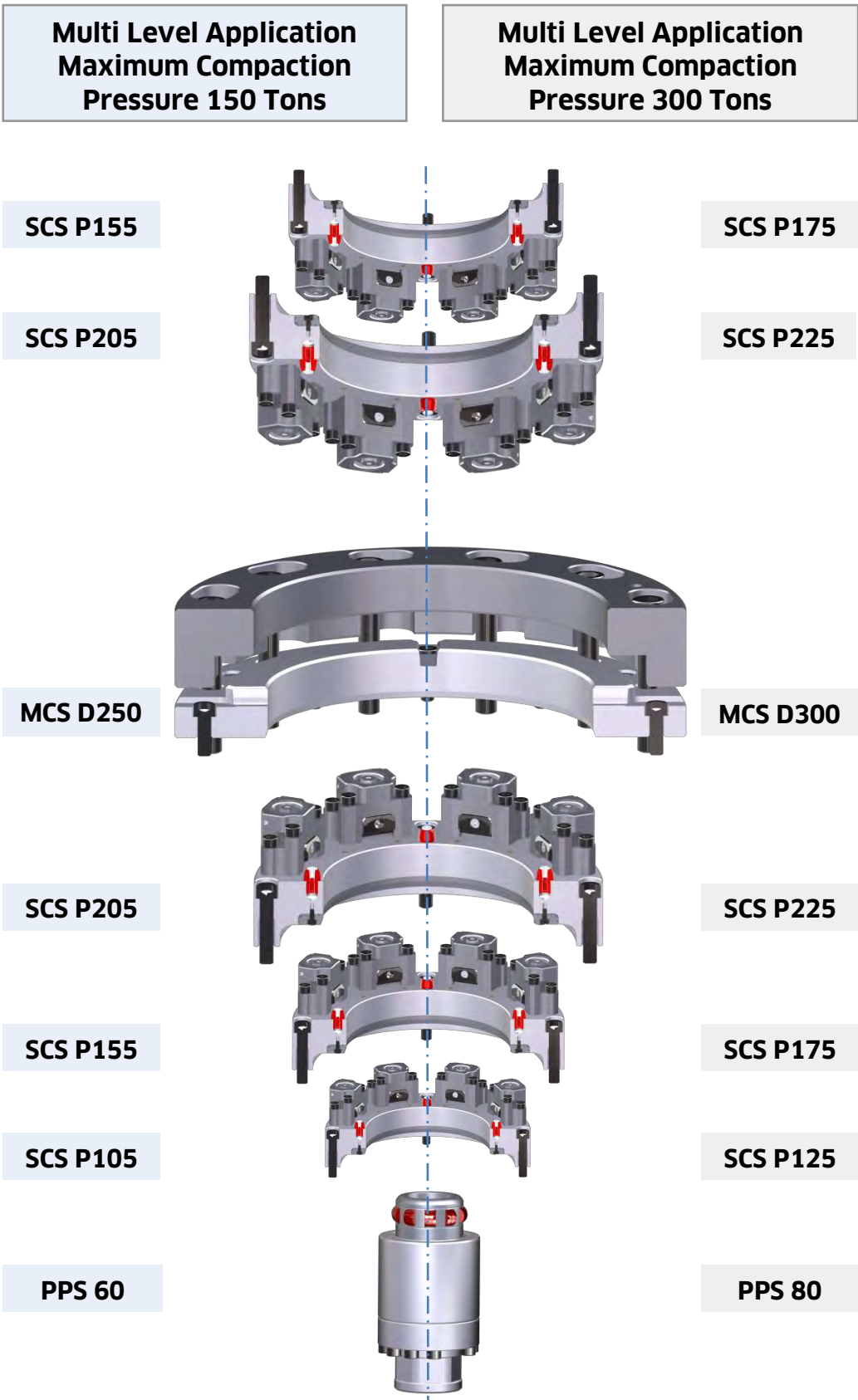
Material	Steel hardened stainless
Positioning system	Groove for cone SCS K double sided
Max. allowed pressure	700 – 2 400 kN
Mechanical fixing	Screws
punch plate	
Electronic identification	RFID optional
Application	Press for clamping of punch plate.



Punch carrier	SCS PT105	SCS PT125	SCS PT155	SCS PT175	SCS PT205	SCS PT225
Product number	P-000 421	P-000 423	P-000 425	P-000 427	P-000 429	P-000 431
d	63 mm	83 mm	108 mm	133 mm	160 mm	180 mm
D	105 mm	125 mm	155 mm	175 mm	205 mm	225 mm
H	*	*	*	*	*	*
Max. allowed pressure	700 kN	950 kN	1 550 kN	1 550 kN	2 100 kN	2 400 kN
Mechanical fixing	8 x M8	8 x M8	8 x M8	8 x M8	8 x M8	8 x M8
punch plate						
Pitch circle punch plate	80 mm	100 mm	130 mm	150 mm	180 mm	200 mm
Weight	3,5 kg	5,4 kg	9,8 kg	11,9 kg	18,1 kg	22,3 kg

* Height of punch carriers must be specified in the order.

Multi Level Application for Compaction of Steel Powder up to Compaction Force of 300 Tons



SCS K Positioning System



Positioning system for flexible and shape neutral positioning of parts

Modular design

Manual positioning system with smallest design for various sizes and shapes of the punch and die and different compaction forces.



Operation

The positioning system works with grinded cones against grinded grooves. Cones and grooves can be positioned in pairs anywhere. Grooves can be used in one or two axis type. The positioning in X, Y and C requires 2 or more paired cones and grooves. Cones mounted and dismantled by a mounting or extraction device.

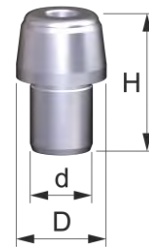
SCS K Positioning Cone



INOX



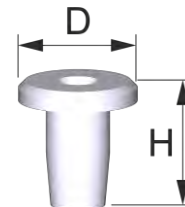
Material	Steel hardened stainless Uncoated / ADLC coated
Mechanical fixing	Pressing / Gluing
Application	Positioning element for reference clamping system on press and machine tool.



Cone	SCS K uncoated	SCS K ADLC coated
Product number	P-000 277	P-000 283
d	10 mm	10 mm
D	14,5 mm	14,5 mm
H	22,5 mm	22,5 mm
Coating	None	ADLC

Protection Pin for SCS K Positioning Cone

Product number	P-000 293
D	9 mm
H	9,5 mm
Material	Plastic
Mechanical fixing	Thread hole M5
Application	Protection of Z0 faces in combination with positioning element Cone SCS K.



Mounting and Extraction Device for SCS K Positioning Cone

Product number	P-001 565
Application	Mounting and Extraction of Positioning Cone SCS K



Control and Supply Unit

The supply and control of the pneumatic chucks is done by control boxes, which are connected with a supply unit.

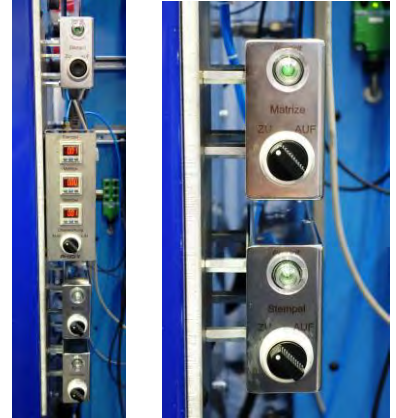
The supervising of the chuck in terms of function and presence of the pallet is ensured by pressure or air flow monitoring switches of the supply unit.

Supply unit

- Air supply of control boxes and chucks (1, 6 and 12 bar)
- Supervising and monitoring operation status of chuck

Control boxes

- Opening, cleaning and clamping (reclamping)
- Supervising and monitoring operation status of chuck



Supply Unit

Inlet pressure	6 bar
Outlet pressure	1 / 6 / 12 bar
Connection for chuck and control box	Tube diameter 4 mm
Supervising	Air flow sensor
Monitoring air flow sensor (digital)	Air flow, upper and lower switching level
Output signal air flow sensor	0,6 / 24 Volt
Service switch	ON / OFF



Supply unit	Without monitor	x2 Monitor	x3 Monitor	x4 Monitor	x5 Monitor
Product number	P-002 030	P-002 050	P-002 080	P-002 060	P-002 040
B x H x T mm	80 x 215 x 400	80 x 215 x 400	80 x 215 x 400	80 x 275 x 400	80 x 335 x 400
Weight	1,6 kg	1,8 kg	1,9 kg	2,5 kg	3 kg

Control Box with Pneumatic Indicator

Operation	Manual by switch
Function	Open / Clean / Clamped (Reclamped)
Inlet pressure	6 / 10 bar
Outlet pressure	1 / 6 / 12 bar
Monitoring operation status	Open / Clamped
Mechanical fixing	Screwed on plate Clamped at column



Control box	Standard	Standard Foot pedal	Reclamping	Reclamping Foot pedal
Product number	P-002 065	P-002 066	P-002 067	P-002 068
B x H x T	50 x 100 x 230 mm	50 x 100 x 230 mm	50 x 100 x 230 mm	50 x 100 x 230 mm
Weight	1,6 kg	1,7 kg	1,7 kg	1,8 kg

Control Box with Digital Air Flow Monitor

Operation	Manual by switch
Function	Open / Clean / Clamped (Reclamped) / Supervising
Inlet pressure	6 / 12 bar
Outlet pressure	1 / 6 / 12 bar
Monitoring operation status	Open / Clamped Supervising operation status of chuck by air flow measurement
Mechanical fixing	Screwed on plate, clamped at column



Control box	Supervising	Standard	Standard Foot pedal	Reclamping	Reclamping Foot pedal
Product number	P-002 039	P-002 035	P-002 036	P-002 037	P-002 038
B x H x T mm	50 x 100 x 230	50 x 100 x 230	50 x 100 x 230	50 x 100 x 230	50 x 100 x 230
Weight	1,6 kg	1,6 kg	1,7 kg	1,7 kg	1,8 kg

Foot Pedal

Product number	P-002 075
Operation	Manual
Function	Open / Clamped (Reclamped)
Inlet pressure	6 / 12 bar
Outlet pressure	6 / 12 bar
B x H x T	90 x 80 x 80 mm
Weight	0,5 kg



Control Box Tool Shop

Operation	Manual by switch
Function	Open / Clamped (Reclamped)
Inlet pressure	6 / 12 bar
Outlet pressure	1 / 6 / 12 bar
Monitoring operation status	Open / Clamped
Service switch	ON / OFF



Control Box	Standard	Standard Foot pedal	Reclamping	Reclamping Foot pedal
Product number	P-002 055	P-002 056	P-002 057	P-002 058
B x H x T	110 x 230 x 85 mm	110 x 230 x 85 mm	110 x 230 x 85 mm	110 x 230 x 85 mm
Weight	1,6 kg	1,7 kg	1,7 kg	1,8 kg

Booster Tool Shop

Product number	P-002 070
Inlet pressure	6 bar
Outlet pressure	12 bar
Connection for chuck and control box	6 connections Tube diameter 4 mm
B x H x T	110 x 210 x 80 mm
Weight	3,2 kg



Compaction Tools and Filler Plates

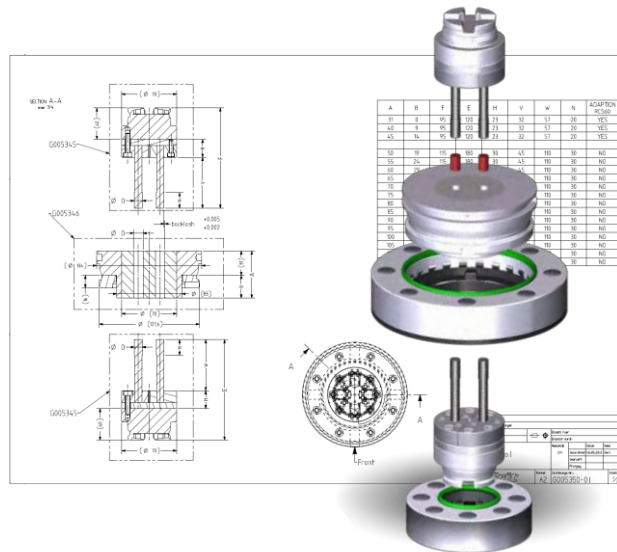
Design and manufacture of complex and high-precision compaction tools

ProGrit supplies for complex product geometries in the field of

- Multi cavities
- Co axial compaction – splitted punch
- Multi axial compaction – cross hole, closed, opened and splitted die

the complete tool technology and manufacturing of the tools.

ProGrit compaction tools are characterized by high precision and durability and allowing burr less compaction. This is made possible by the unique design of the compaction tools in conjunction with the latest manufacturing methods and best materials for the production of ProGrit compaction tools.



Compaction tools for multi cavities



Compaction tools for sensitive geometries



Compaction Tools for Multi Axial Compaction – Cross Hole, Closed, Opened and Splitted Die

- Design and manufacture of compaction tools for multi axial compaction for the drive concepts of different press manufacturers
- Optimized drive concepts of the side axes including high precision and high rigid mechanical stops, which are adjustable in the micro meter range
- System for change of die plates for the rapid conversion of the press to multi axial compaction without realignment of the chucks. Complex die designs can be equipped and adjusted outside of the press.
- Adjustment system MAS xi for side axes and their mechanical stops (see catalogue «ALIGNMENT MEASUREMENT ANALYSIS»)



Ask for compaction tools for your specific compaction tasks!

Filler Plates Manual and Automatic

Highly wear-resistant chrome-plated filler plates with quick-change system for dies and die attachment.

Filler Plate Manual

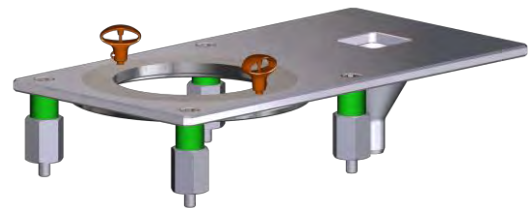
Operation	Manual
Function	Manual stepless adjustment to height and outer diameter of the die
Material	Steel stainless hard chrome plated



Filler Plate Manual	MCS C260 RCS II 135	MCS C310 RCS II 180	MCS C360 RCS II 230
Product number	P-004 947	P-005 225	P-000 000
B x H x T	340 x 220 x 10 mm	400 x 270 x 12 mm	460 x 320 x 12 mm
Weight	4,8 kg	5,5 kg	6,2 kg

Filler Plate Manual with Powder Emptied Hopper for RCS II 135

Product number	P-004 945
Operation	Manual
Function	Manual stepless adjustment to height and outer diameter of the die Powder emptied hopper
Material	Steel stainless hard chrome plated
B x H x T	425 x 220 x 10 mm
Weight	5,7 kg



Locking Pin for Handling of Filler Plate Ring

Locking pin	6 x 10
Product number	P-000 000
d x l	6 x 10
Weight	0,15 kg



Filler Plate Automatic

Product number	P-000 000
Operation	Automatic / Pneumatic
Function	Automatic stepless adjustment to height of the die
Material	Steel stainless hard chrome plated
Air connection	Releasing and docking of filler plate to die
Operation	Pneumatic control and support unit
B x H x T	- mm
Weight	- kg

Multi Axial Compaction System Side Compaction / Splitted Die

Multi axial compaction for production of complex geometries by cross hole, closed die, opened die, opened die and splitted die.

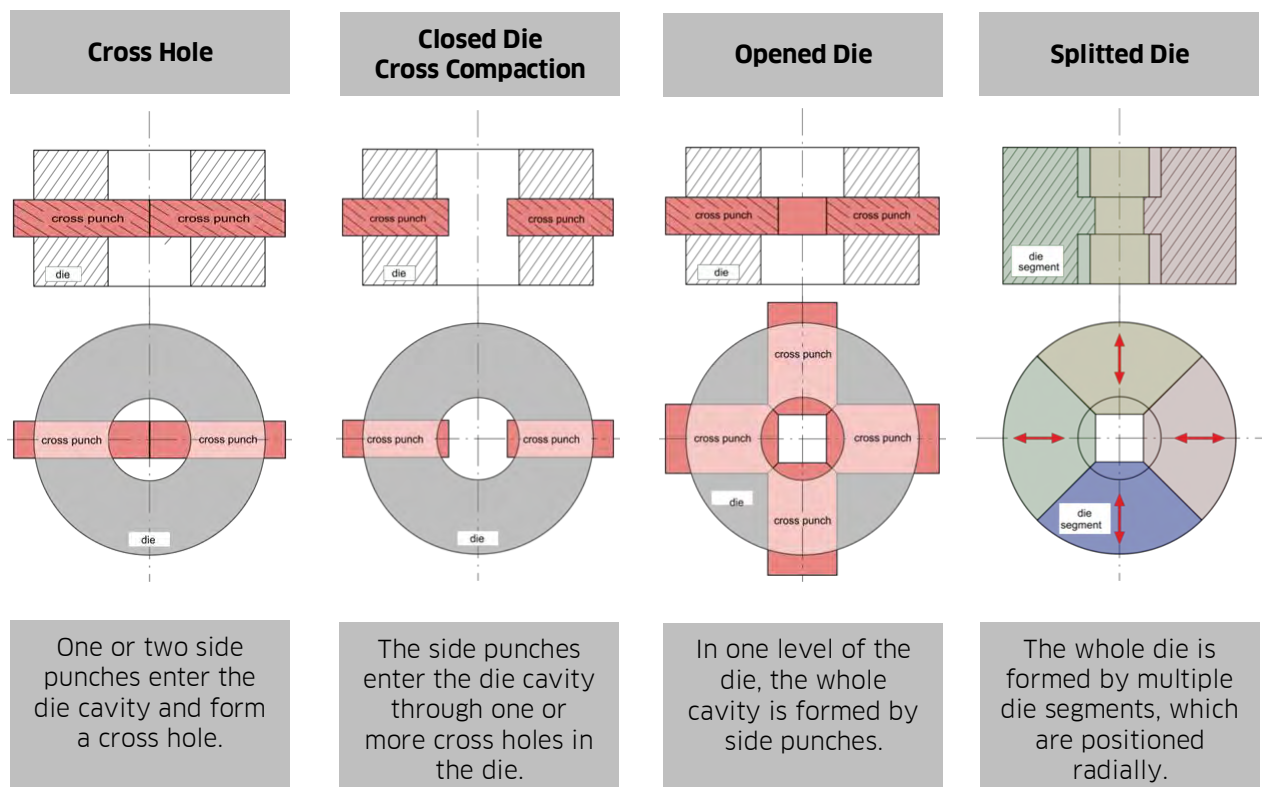
ProGrit provides for economic and high-precision manufacturing of complex geometries a multi axial compaction system consisting of:

- Complete tool system
 - o Die with adjustable mechanical stop with positioning accuracy of 0,001 mm
 - o Upper and lower punch
 - o Filler plates
- Electrical drive modules with compaction force of 6 to 35 tons for 1-6 times arrangement, controlled positioning accuracy $\pm 0,001$ mm and optional force measurement
- Control for electrical drive modules
- Positioning system for tool and drive modules - changeable plate system MCS C 260
- Simple adjustment system for the axis of the drive modules
- Measurement system MAS-xi for the measurement and alignment of the drive module axis to the vertical compaction axis
- Manipulator for the simultaneous installation and removal of several drive modules



The multi axial compaction system is clearly superior to the MIM manufacturing process in terms of efficiency and accuracy for the majority of complex geometries and can replace the MIM process.

Multi axial compaction can basically be divided into four different sub-methods. All of these sub-methods are supported by the multi-axial compaction system.



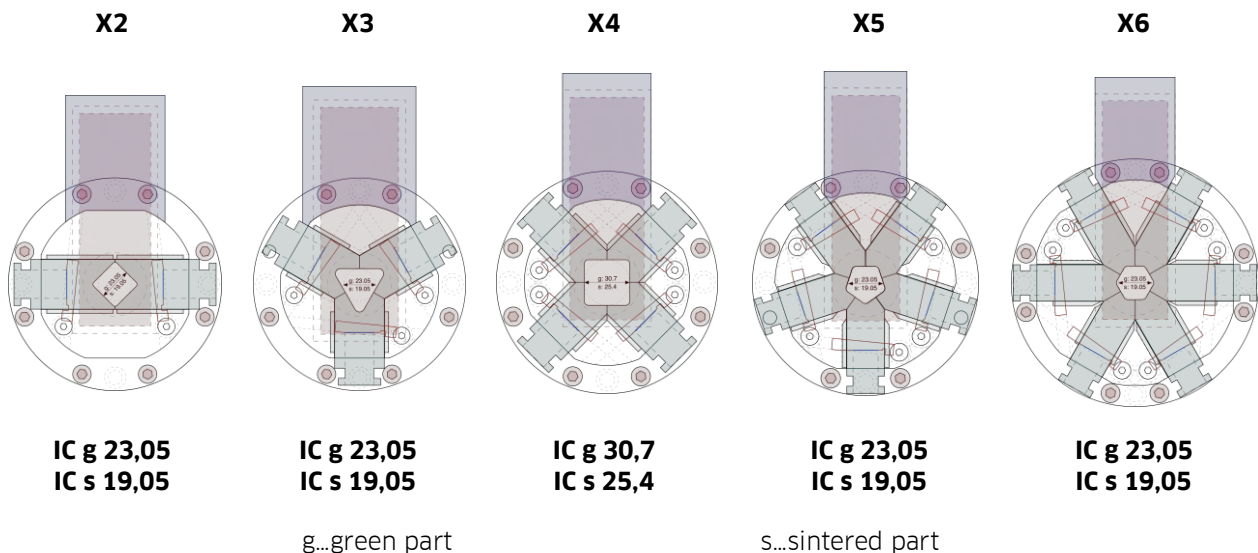
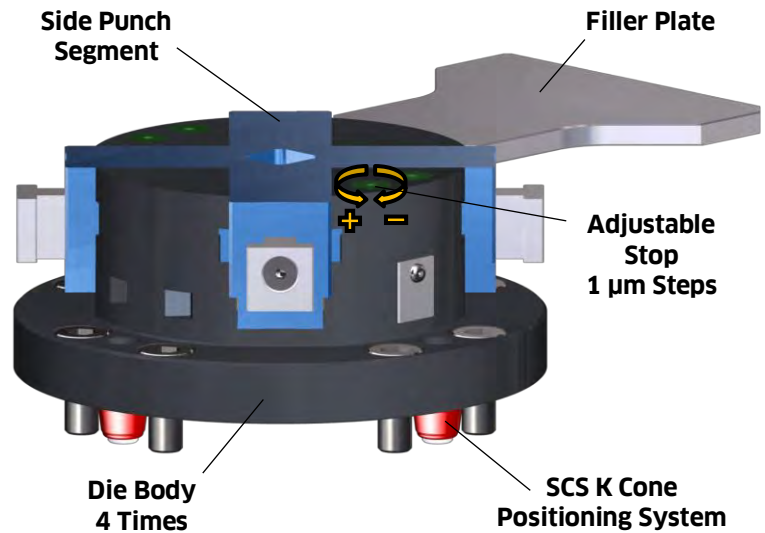
The sub-methods "open" and "splitted" die need high-precision adjustable mechanical stops. The side punches or segments are maximal pressed against these mechanical stops.

The high-precision mechanical stops are integrated into the die body and adjustable in steps of 0,001 mm from above. The die body guides the side punches or segments and is positioned and screwed to the vertical press axis by the SCS K cones and the changeable plate MCS C260 with high precision.

The adjustment of the mechanical stops can be done outside of the press or inside the press by the measurement system MAS-xi or the usage of the upper punch.

The adaptation to the part geometry will be done by the side punch or segments. The die body with the adjustable mechanical stops remains the same within 2 to 6 times arrangement and is used several times

The die body with adjustable mechanical stops is available for 2 to 6 times arrangements and could be also used without these stops. The drive of the side punch or segments can be done by electric or hydraulic drive modules.



Die Body with Adjustable Mechanical Stops

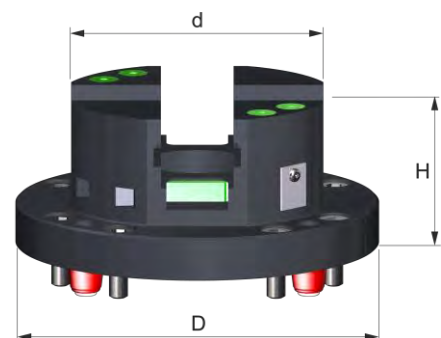


auto

INOX



Material	Steel, hardened, stainless
Positioning system	Cone SCS K
Clamping force	240 000 N
Air connection	None, manual clamping
Operation	Manual clamping
Mechanical fixing	Screwed from top side
Adjustment range mechanical stop	0,5 mm
Accuracy mechanical stop	0,001 mm
Application	Press and machine tools for guiding of side punches and segments

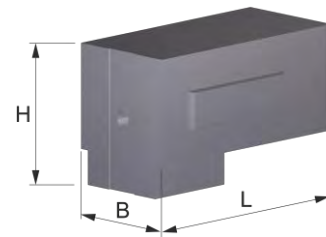


Die body with adjustable mechanical stops	2 times	3 times	4 times	5 times	6 times
Product number	P-008 660	P-000 000	P-000 000	P-000 000	P-000 000
d	124 x 124 mm	130 mm	130 mm	130 mm	160 mm
D	175 mm	175 mm	175 mm	175 mm	205 mm
H	63 mm	63 mm	63 mm	63 mm	63 mm
Width segment / side punch	40 mm	35 mm	30 mm	25 mm	25 mm
Mechanical fixing	8 x M10	8 x M10	8 x M10	8 x M10	8 x M10
Pitch circle fixing	154 mm	154 mm	154 mm	154 mm	184 mm
Weight	- kg	- kg	- kg	- kg	- kg

Segments or side punches will be delivered in the form of semi-finished products for further machining of the cavity. Segments and side punches could be also ordered with the shape of the cavity.

Segment / Side Punch

Material	Tungsten carbide
Guiding system	Guided by guidance of the die body
Positioning system	Positioning through the control of the press or by the mechanical stop of the die body
Interface / Connection	T-slot interface
Application	Die body for forming the cavity



Segment / Side punch with mechanical stop	2 times Width 40	3 times Width 35	4 times Width 30	5 / 6 times Width 25
Product number	P-008 632	P-000 000	P-007 841	P-000 000
Segment / Side punch without mechanical stop	2 times Width 40	3 times Width 35	4 times Width 30	5 / 6 times Width 25
Product number	P-000 000	P-000 000	P-000 000	P-000 000
B x L	40 x 64 mm	35 x 59 mm	35 x 59 mm	35 x 59 mm
Height with mechanical stop / without mechanical stop	38 / 28,5 mm	38 / 28,5 mm	38 / 28,5 mm	38 / 28,5 mm
Weight	- kg	- kg	- kg	- kg

Filler Plate

Operation	Manual
Function	Manual stepless adjustment to height and outer diameter of the die
Material	Steel, stainless, hard chrome plated



Filler plate	2 times	3 times	4 times	5 times	6 times
Product number	P-008 670	P-000 000	P-007 915	P-000 000	P-000 000
Weight	- kg	- kg	- kg	- kg	- kg

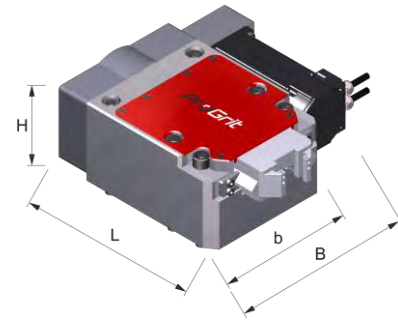
The side punch or segments are driven by electric drive modules. There are different sizes available - a small drive module 140 with 6 tons compaction force, a bigger drive module 160 with 10 tons of compaction force and drives modules up to 35 tons on request. For the 6 times arrangement only the small module 140 with 6 tons compaction force is usable.

The electric drive modules are characterized by their very high forces and velocities and the very high positioning accuracy and optional piezoelectric force measurement.

The side punches and segments may be driven by hydraulic drives alternatively.

Electrical Drive Module

Material	Steel, hardened, stainless
Max. compaction / hold force	60 - 350 kN
Max. axis stroke*	25 mm *
Max. axis speed	75 - 110 mm/s
Positioning accuracy	+/- 0,001 mm
Force measurement	Piezoelectric optional
Mechanical fixing	Screwed from top side
Positioning system	Cone SCS K optional
Application	Press for movement and positioning of side punches and segments



* Longer axis strokes on request.

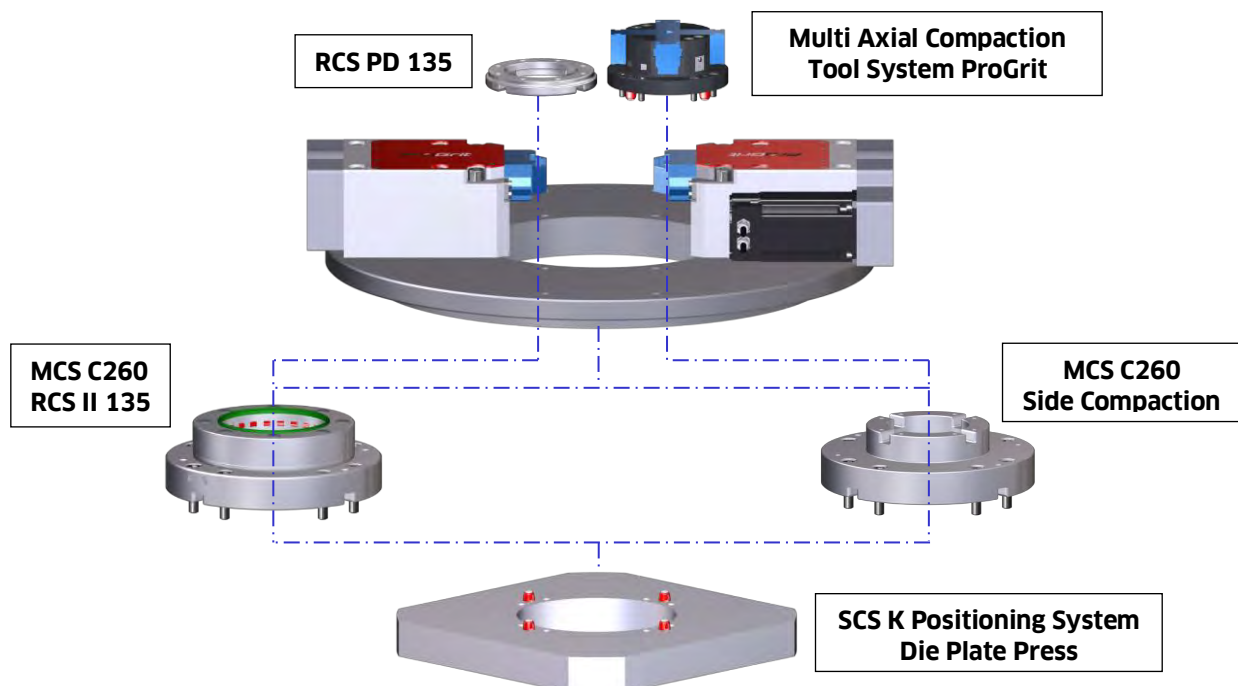
Electrical drive module	Module 6/140 6 tons	Module 10/160 10 tons	Module 20/- 20 tons	Module 35/- 35 tons
Product number	P-008 120	P-000 000	P-000 000	P-000 000
Max. compaction / Hold force	60 kN	100 kN	200 kN	350 kN
Max. axis stroke *	25 mm	25 mm	25 mm	25 mm
Max. axis speed	95 mm/s	110 mm/s	80 mm/s	75 mm/s
b	140 mm	160 mm	- mm	- mm
B x L x H mm	205 x 206,5 x 86	240 x 220 x 97	- mm	- mm
Mechanical fixing	6 x M12	6 x M12	- mm	- mm
Weight	- kg	- kg	- kg	- kg

Electrical drive module	Module 6/140 6 tons 1-5 times	Module 6/140 6 tons 6 times	Module 10/160 10 tons 1-5 times	Module 10/160 10 tons 6 times
Minimum outer diameter of die body	d 130 mm	d 160 mm	d 130 mm	- mm

The drive modules can be integrated into any press control. For stand-alone applications ProGrit provides a complete control for the drive modules.

The die body with adjustable mechanical stops and the side punches or segments is positioned fixed on the changeable plate MCS C260 by the positioning system SCS K within +/- 0.001 mm to the vertical press axis.

Multi axial compaction system with changeable plate concept MCS C260:



Manipulation Fixtures for Compaction Tools and Press Levels



Handling of compaction tools

ProGrit delivers manipulation fixtures, handling systems and gripper for complex compaction tools and difficult set up situations.

Ask for a customized solution!

Manipulation Fixture Die

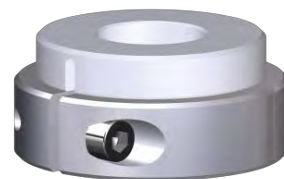
Operation	Manual
Function	Manipulation of heavy dies on the base RCS reference clamping system
Material	Steel stainless, aluminium, with locking mechanism



Manipulation Fixture Die	RCS II 135	RCS II 180	RCS II 230
Product number	P-004 980	P-005 230	P-000 000
Weight	0,75 kg	1 kg	1,2 kg

Clamping Ring for Block Set Up of Die RCS 135 with Punch RCS 60 / RCS 95

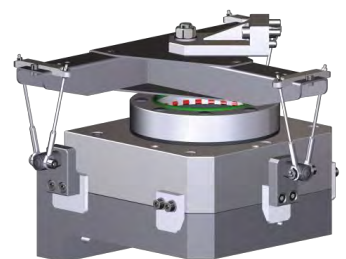
Product number	P-004 985
Operation	Manual
Function	Clamping of punch above die
Material	Clamping ring stainless steel Plastic ring adapted to punch shape
Weight	0,2 kg



Handling of Press Levels – Press Level Change Technology

Flexible set up of presses and difficult set up and alignment tasks should be done outside of the press. This requires the positioned change of press levels or press plates.

Positioning and handling solutions from ProGrit support the positioned change of press levels or press plates.



Automation of Manufacturing of Tools and Compaction Processes

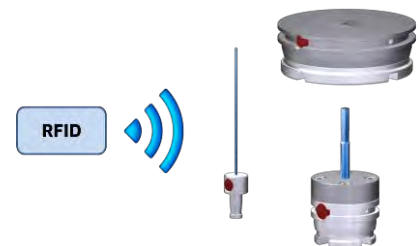
Automation over the whole powder compaction process chain - from the tool shop up to the fully automated set up of presses

ProGrit provides corresponding robots, manipulators, grippers and identification systems including the process engineering for integrated fully automated production of compaction tools and the fully automated operation of one or more press cells.

Tool Shop- Fully Automated Production of Compaction Tools

Fully automated production of compaction tools with the help of

- Handling inclusive gripper for compaction tools
- Identification systems (RFID,...) for compaction tools
- Process control systems for machine tools inclusive connection to data bases and ERP systems



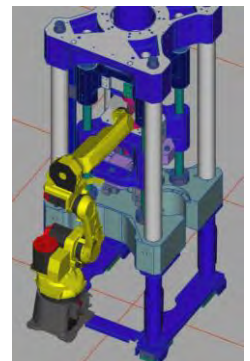
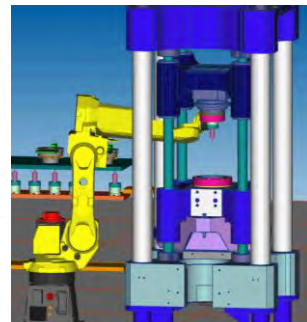
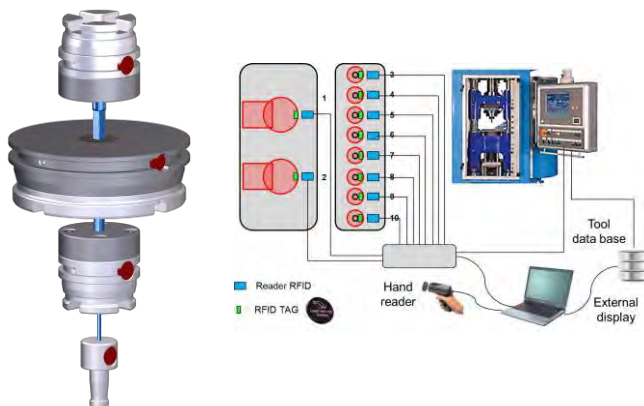
Quality Assurance - Fully Automated Measurement and Calibration of Compaction Tools with TCQ System

Fully automated measurement and calibration of compaction tools is done by using the TOOLING CALIBRATION QUALITY system TCQ. All press relevant tool data is automatically measured and stored in a database or in the ERP system for future compaction tasks. The unambiguous assignment of the data to each tool is done by an identification system.



Press - Fully Automated Tool and Powder Set Up inclusive Automated Set Up of the Press

The compaction tools and powder containers are clearly recognized by an identification system and according to the compaction task from the ERP system fully automated set up into the press. All press related adjustment data is automatically transmitted by the identified tools and powder container from the database or the ERP to the press control.



Ask for a customized automation solution for your powder compaction process chain!

Alignment, Measurement and Analysis Systems

The use of reference clamping systems for compacting of metal and ceramic powders leads to a considerable increase in productivity and compaction quality. At the same time the demands on tool, press and adapter accuracy and the accuracy of alignment and referencing of the reference clamping systems to each other is rapidly increasing.

The alignment, measurement and analysis systems of ProGrit are needed to reach the level of this increased accuracy requirements and guarantee a trouble-free entry into the compaction technology with reference clamping systems.

The measurement systems are supporting alignment, measurement and analysis tasks for following applications:

- Press and die set
- Compaction process
- Reference clamping system
- Compaction tools
- Drives and positioning of press tools for multi axial compaction (cross hole, closed, opened and splitted die)

Press/Die Set/Process

APC-4i

Measurement and correction of press / die set geometry

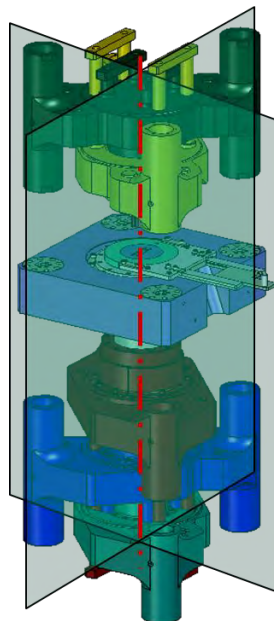
DYNALYSE

Dynamic analysis of press, die set and process

Multi Axial Compaction

MAS-xi

Referencing of multi axial compaction and tool systems. Closed, opened and splitted die



Reference Clamping System

TPS-3i

Positioning of reference clamping systems

ZRM

Referencing of reference clamping systems

Compaction Tools

PAS-3i

Palletization and positioning of compaction tools

TCQ

Calibration and quality assurance of compaction tools

Measurement systems support press, die set and reference clamping systems of Dorst, Erowa, Fette, Kobayashi, Komage, Osterwalder, Proment, Precision Compacting, ProGrit, System 3R°

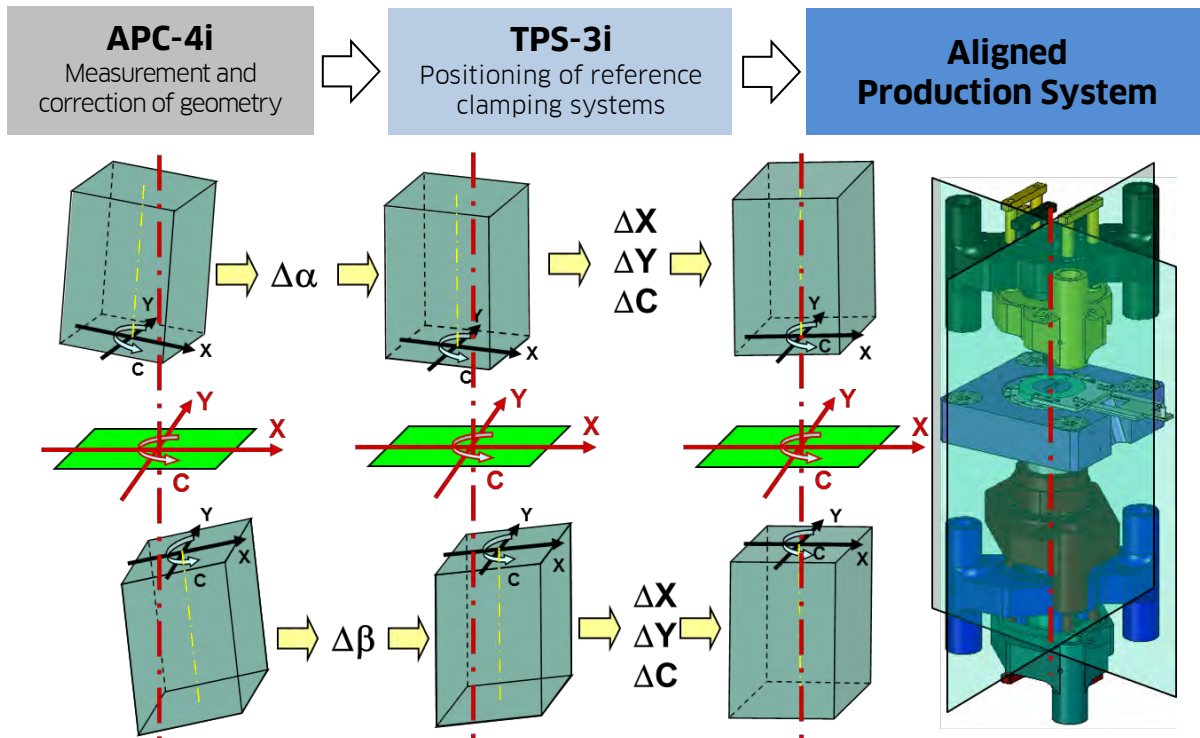
The measurement systems are characterized by a mobile hardware with easy-to-use and modularly expandable software components and by inexpensive high-precision measurement devices.

The two measurement systems APC-4i and TPS-3i represent the core functions of the ProGrit measurement technology.

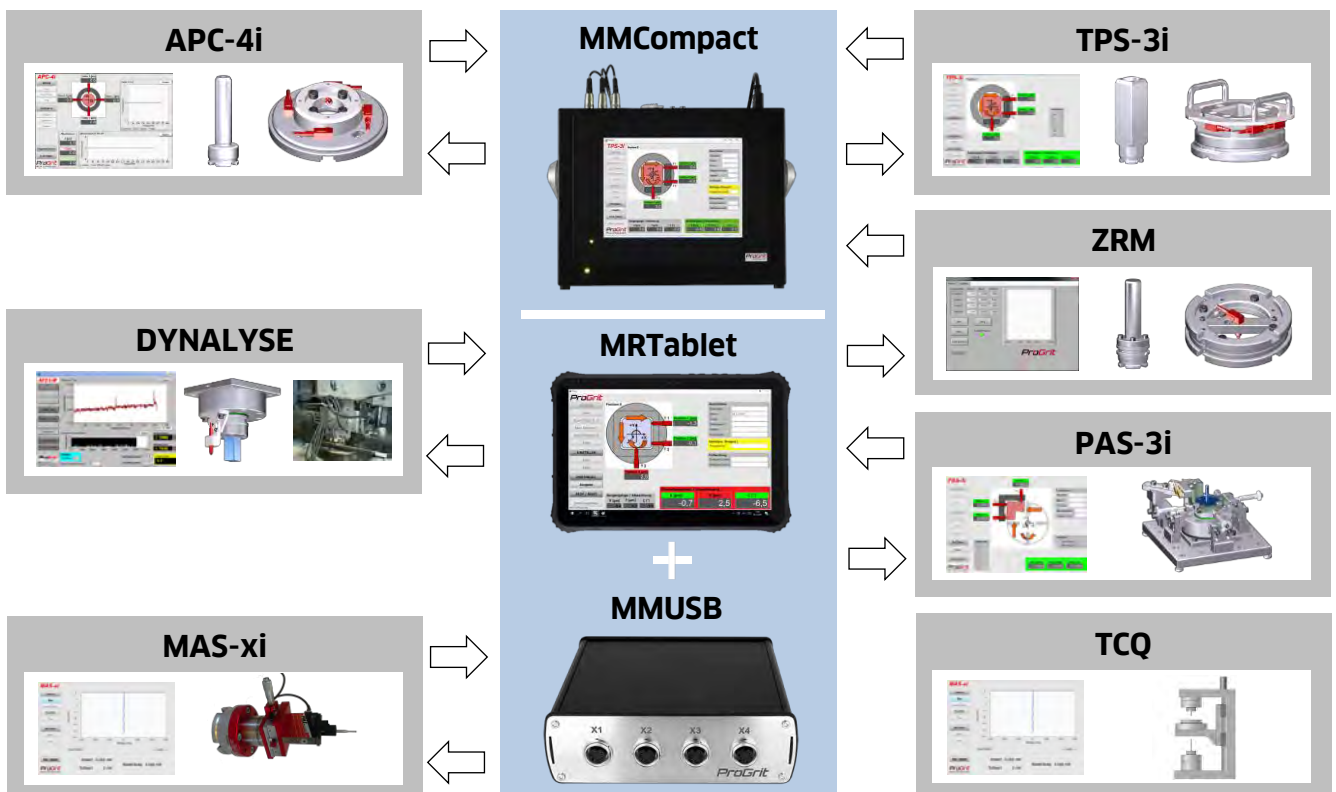
APC 4i measures the geometry of the chuck on the press plates in reference to the guides of the press. The geometry can be corrected immediately after the measurement in the press or die set by using the ProGrit geometry correction system.

TPS-3i measures the position of the reference clamping systems to the defined reference point - usually the die chuck. The to be aligned reference clamping system is moved and fixed by means of the ProGrit displacement system in the optimum position.

APC-4i and TPS-3i guarantee an optimal aligned production system.



The measurement systems can be expanded modularly around the mobile measurement module MMCompact or MRTTablet plus MMUSB with the appropriate software and measurement device.



Measurement systems support press, die set and reference clamping systems of Dorst, Erowa, Fette, Kobayashi, Komage, Lauffer, Osterwalder, Proment, Precision Compacting, ProGrit, Sacmi, System 3R°

The alignment, measurement and analysis systems are available for all current on the market known clamping systems. Alignment, measurement and analysis systems are also available on a rental service base.

For further information see catalogue «ALIGNMENT MEASUREMENT ANALYSIS».

ProGrit is specialized in clamping, measuring and tooling technology for the compaction of metal and ceramic powder.

Innovative products combined with unique know how and purposeful engineering leads to the comprehensive mastery of the technology chain of compaction of metal and ceramic powders, building the base of success for our customers.

In addition to the innovative products ProGrit offers technical and economical consulting in the field of compaction, grinding, measurement, tool and production technology for the machine tool industry and the tool and die manufacturing.

ProGrit offers comprehensive and holistic consulting & engineering services – from the analysis of the current state up to the industrial realization and implementation of complex engineering solutions.

Technical modifications reserved.

For a number of products of ProGrit GmbH, patents have been granted or are pending.

Trademarks of other, unrelated companies:

EROWA and ITS are registered trademarks of EROWA AG. 3R, 3Refix and MACRO are registered trademarks of System 3R, International AB or its affiliates.

Copyright © ProGrit 2018



ProGrit GmbH · Kastellstrasse 6 · 8623 Wetzikon / Switzerland
Phone +41 (0)44 844 54 26 · progrit@progrit.com · www.progrit.com