



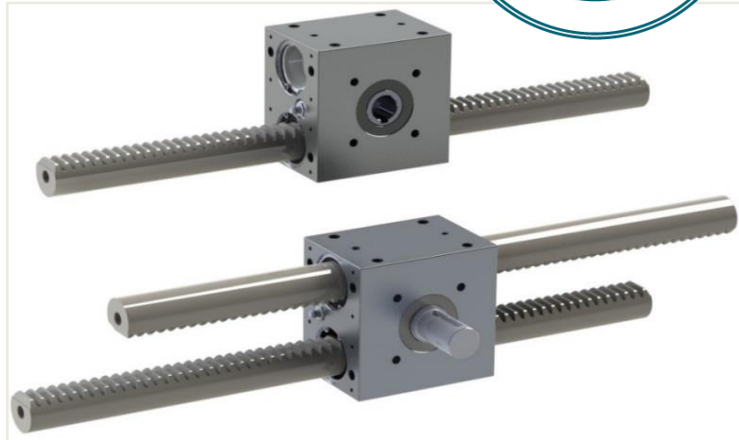
WMH Herion
part of your drive

Rack Jack (Round Rack Type)



Operation

The Rack Jack from WMH Herion provides simple synchronous lifting movements. The system of rack and pinion shaft transforms linear motion to rotation and vice versa. The force-locked connection between the lifters or drive components is achieved by profile shafts.



The Rack Jacks are available with one or two racks. In the double version, the racks move in opposite directions.

This simple mechanical principle ensures a failure-free, durable and reliable operation of the product. Thanks to its compact construction in robust square housings, the lifters are particularly insensitive to external influences.

Characteristics

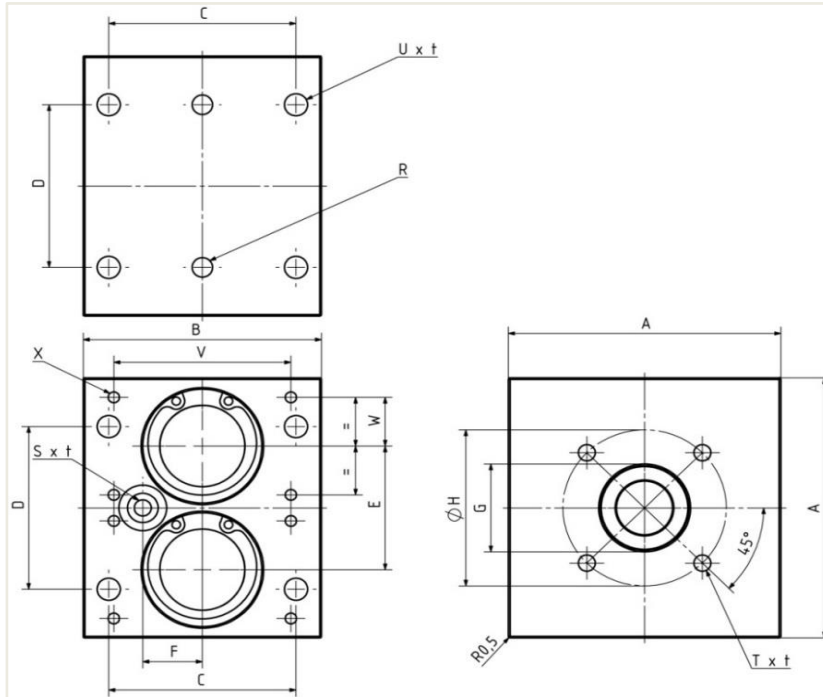
- Simple and economical lifting devices
- Robust design for long service life and continuous use
- High bending stiffness due to the large diameter and wide toothing of the rack
- Robust sliding guide for the rack
- Simple structure, high repeatability
- Average lifting speed, precise positioning in the lifting direction
- Complete range consisting of 6 sizes with 800 N - 160,000 N lifting force
- All sizes with same design principle and functioning
- Numerous mounting options incl. flange connection
- 4 pinion shaft versions each are available for sizes 1 to 3; from size 4 onwards manufacturing according to customer requirements
- Housing made of aluminum (sizes 1 to 3) or as welded steel construction (from size 4)

Application Areas

- Lifting in / out of flaring tools and devices
- Lifting of frames of all kinds
- Feed devices (drawer principle, etc.)
- Feeding system for nozzels, suction devices, etc.
- Gripper movement / closing movement
- Sequential width adjustment
- Lifting columns for the raising and lowering of conveyor belts or other conveyor systems
- Height adjustment on pivoting devices
- Turning and tilting systems
- Lifting tables for the lifting of car bodies in the automotive industry
- Lifting tables with different structures, such as roller conveyors and clamping frames (in the automobile production)
- Centering and pushing together of beverage bottles on filling machines
- Pushing in / pushing forward of packages in the packaging industry
- And many more besides...



Technical Data - Rack Jack (Round Rack Type) Sizes 1 to 3



Gearbox dimensions

Size	A	B	E	F	G	S x t	X x t
1	80	70	38	20	26	M10x1 x 10	M4 x 6
2	110	80	61	15	47	M10x1 x 10	M4 x 8
3	180	130	99	15	72	M10x1 x 10	M4 x 8

- G Centering flange (when using gasket please remove)
- t Depth dimension
- S Lubrication hole
- X Rack protection

Mounting dimensions

Size	C	D	H	R ^{H7} x t	T x t	U x t (∅ **)	V	W
1	55	50	48	6 x 5	M6 x 12	M8 x 16 (∅ 6.8)	52	15
2	60	72	72	6 x 3	M8 x 12	M10 x 20 (∅ 8.5)	60	18
3	105	120	110	6 x 5	M10 x 20	M12 x 27 (∅ 10.2)	100	35

- t Depth dimension
- ∅ ** Value in brackets corresponds to the through hole below the thread

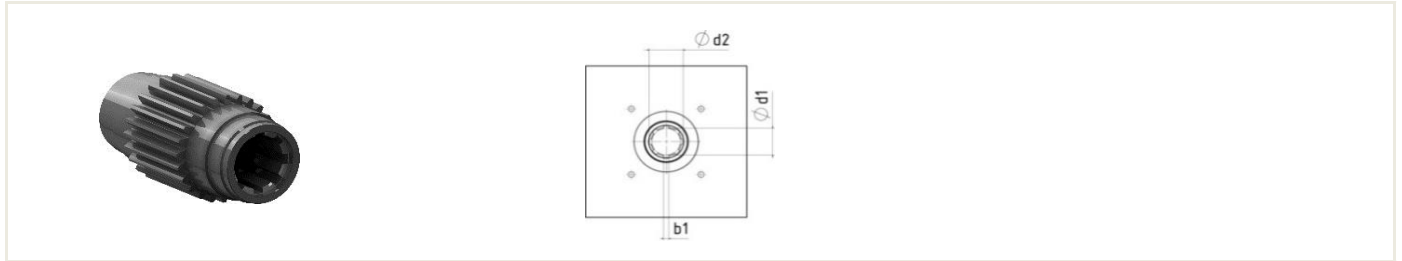
On request - for example in case of deviating available installation space or in the context of a complete custom-made solution - we offer to design and manufacture housings according to customer specifications. Please contact us to clarify individual production capabilities.



Technical Data - Pinion Shafts Sizes 1 to 3

For the sizes 1 to 3 of the Rack Jack, 4 pinion shaft versions each are available for a wide variety of connection options. The pinions' tooth geometry is identical in each size for all Rack Jack types. Customized pinion shafts are available on request.

1. Pinion Shaft with Spline Profile - Connection Dimensions

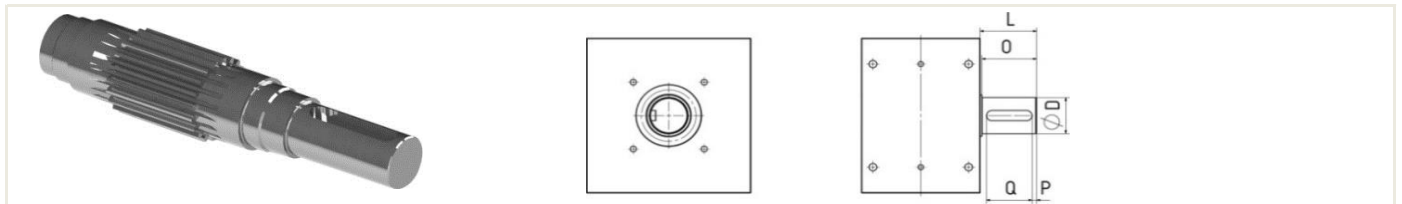


Spline profile DIN ISO 14

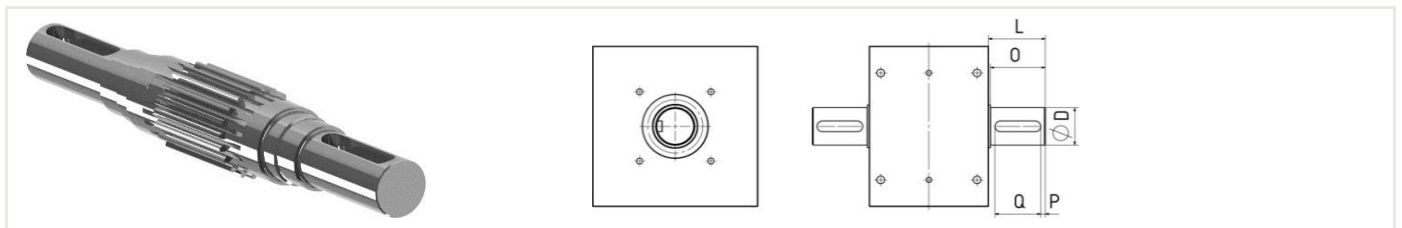
a: Number of splines
(drawing shows size 3)

Size	a x d ₁ x d ₂	b ₁
1	6 x 11 x 14	3
2	6 x 16 x 20	4
3	8 x 32 x 38	6

2. Pinion Shaft with Shaft End on One Side - Connecting Dimensions



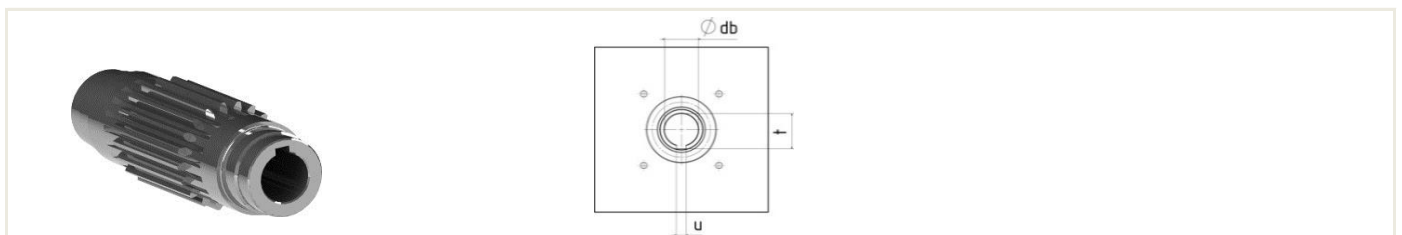
3. Pinion Shaft with Shaft End on Both Sides - Connecting Dimensions



Keyway acc. to DIN 6885 P9

Size	∅ D ^{h7}	L	O	P	Q
1	14	32	30	2	25
2	25	47	45	5	36
3	42	62	60	5	50

4. Pinion Shaft (Hollow Shaft) with Keyway - Connecting Dimensions

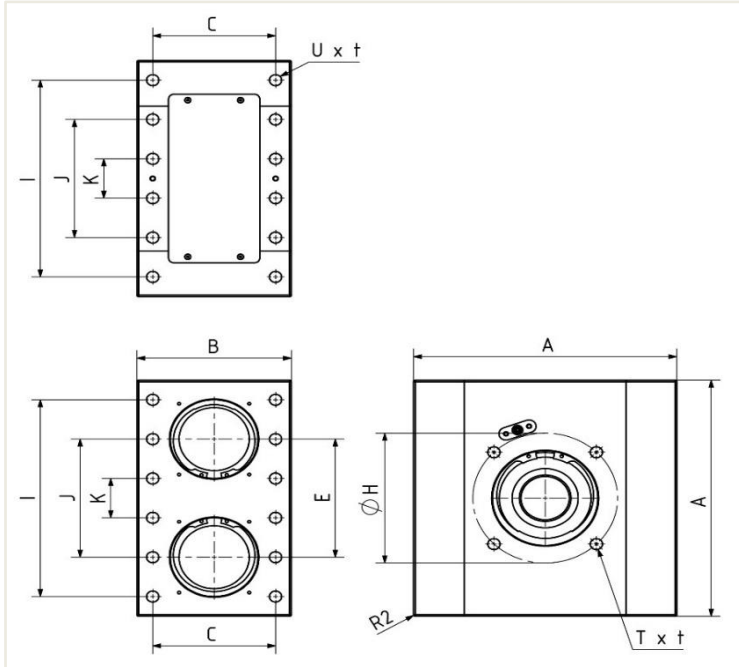


Keyway acc. to DIN 6885 P9

Size	d _b ^{H7}	u	t
1	10	3	11.4
2	20	6	22.8
3	35	10	38.3



Technical Data - Rack Jack (Round Rack Type) Sizes 4 to 6



Gearbox dimensions

Size	A	B	E	G	X x t
4	300	176	150	120	M4 x 8
5	450	260	on request		
6	550	320	on request		

- G Centering flange (when using gasket please remove)
- t Depth dimension
- X Rack protection

Mounting dimensions

Size	C	H	I	J	K	T x t	U x t
4	140	165	250	150	50	M16 x 32	M16 x 32
5	on request						
6	on request						

- t Depth dimension

On request - for example in case of deviating available installation space or in the context of a complete custom-made solution - we offer to design and manufacture housings according to customer specifications. This applies particularly to size 5 and 6 housings. Please contact us to clarify individual production capabilities.

Individual Solutions - Pinion Shafts Sizes 4 to 6

From size 4 on, the pinion shafts of the Rack Jack are manufactured exclusively to customer specifications and drawings. In advance, a detailed examination of the respective application and a corresponding design and construction of the pinion shaft takes place. Close coordination with the customer is a matter of course.



Technical Data - Round Racks

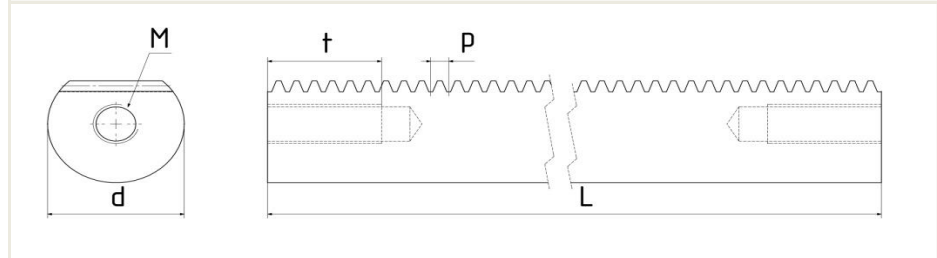
In the Rack Jack, the racks transfer tension and compression forces; they do not accept transverse forces. Slide bushes are used to support the racks.

Straight teeth

Pressure angle 20°

Toothing quality 8 h27

Outer diameter is ground h6



for Size	Module	d ^{h6}	M x t	Material	[kg/m]	p	L = z x p
1	1.0	25	M10 x 30	ETG [®] 100	3.50	3.1416	acc. to customer specifications, please state the required number of teeth in your request & order
2	2.5	32	M12 x 35	ETG [®] 100	5.50	7.8540	
3	2.5	60	M20 x 50	ETG [®] 100	19.10	7.8540	
4	5.0	80	M24 x 45	C45, hardened	33.90	15.7080	
5	8.0	120	on request	C45, hardened	76.70	25.1327	
6	12.0	150	on request	C45, hardened	117.60	37.6991	

z: Number of teeth

p: Pitch

ETG[®] 100 is a high-quality alloy steel with a tensile strength of 960-1100 N/mm².

The standard design of the rack includes a mounting thread (M x t, stated in the table) on both ends. Please inquire for individually machined rack ends according to customer requirements and drawings.

Protective Cover & Fastening Device

For use in environments that are heavily contaminated with dust or metal abrasion, our rack jacks can be equipped with a protective cover.

Bellows protect the racks from contamination and accumulation of dirt and dust and prevent damage to the rack jack by foreign particles.

The protective cover is easy to use and is designed and customized for each rack jack. In case of need, please mention this in your inquiry.



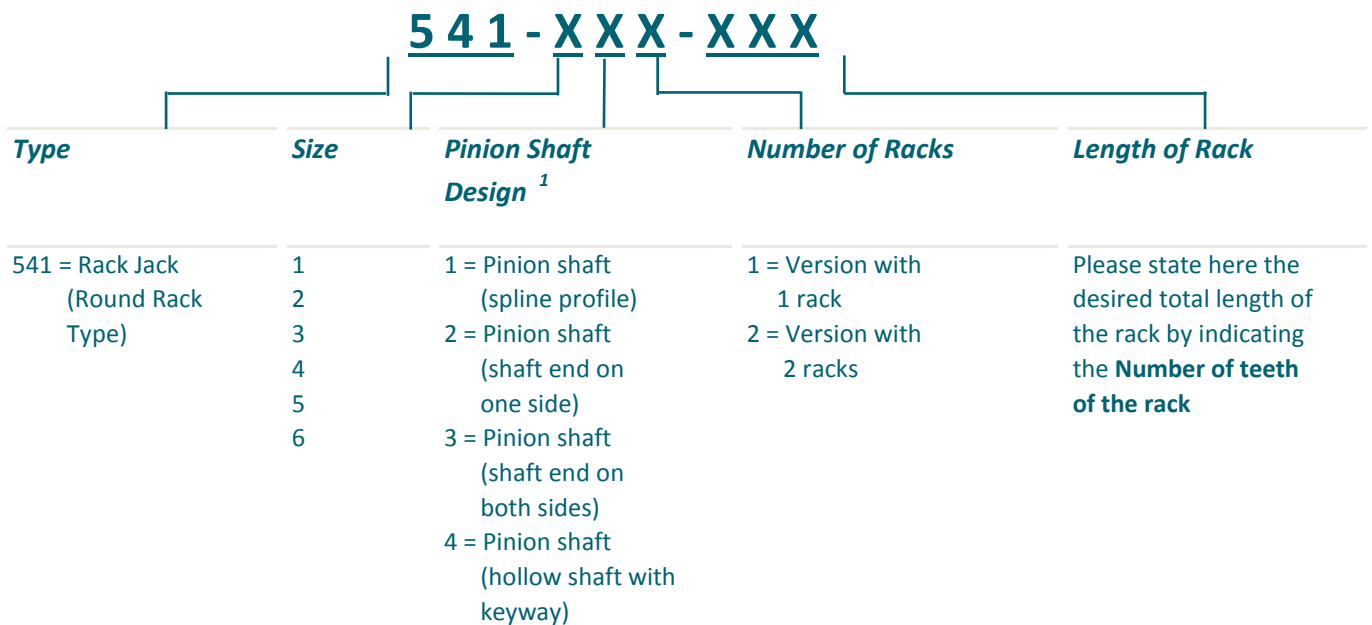


Performance Data - Rack Jack (Round Rack Type)

			Size		
		Unit	1	2	3
Lifting force	F_{max}	N	800	2000	8000
Lifting speed	v_{max}	m/s	0.6	0.6	0.6
Acceleration	a_{max}	m/s^2	30	30	30
Torque	$M_{t max}$	Nm	8	40	240
Pitch circle diameter	$\varnothing d$	mm	20	40	60
Ratio	Stroke	mm/360°	62.8318	125.6637	188.4955
Operating temperature		°C	- 10 to +100		

			Size		
		Unit	4	5	6
Lifting force	F_{max}	N	25000	70000	160000
Lifting speed	v_{max}	m/s	0.6	0.6	0.6
Acceleration	a_{max}	m/s^2	30	30	30
Torque	$M_{t max}$	Nm	1250	5600	18240
Pitch circle diameter	$\varnothing d$	mm	100	160	228
Ratio	Stroke	mm/360°	314.1592	502.6548	716.2831
Operating temperature		°C	- 10 to +100		

Configuration - Rack Jack (Round Rack Type)



¹ Specifications apply to sizes 1 to 3.

For Rack Jack sizes 4 to 6, the design and manufacturing of the pinion shaft is carried out according to customer requirements.



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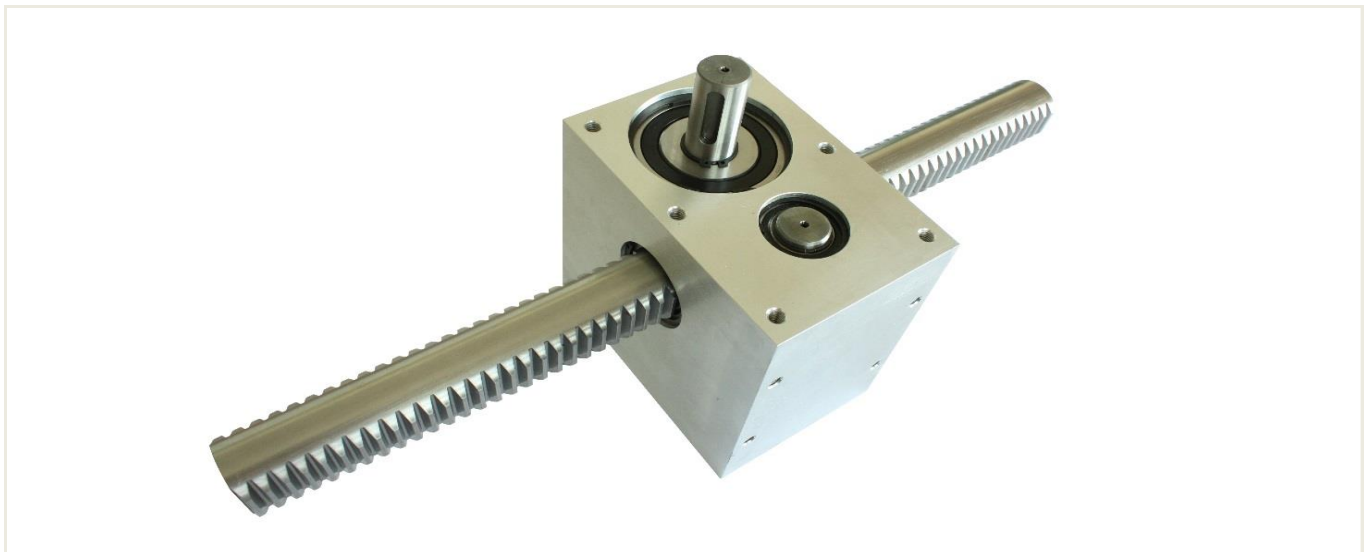


Rack Jack (Round Rack Type) with Double Sided Toothed Rack

The concept of the classic Rack Jack is developed further in the Rack Jack with double sided toothed rack. Due to the design of the rack with double sided toothing, it is possible to transmit up to twice as high a load with the same rack diameter while keeping the moving mass of the rack comparatively low at the same time. This is particularly advantageous in applications with faster, shorter and dynamic strokes, since the moving mass is lower.

In addition, a very balanced power ratio is achieved by the introduction of forces on two opposite sides of the rack. Thus, the load values that affect the sliding bearing of the round rack are reduced. The service life of the components and thus of the entire Rack Jack is thereby significantly increased.

Also in comparison with hydraulic cylinders, the Rack Jack with double sided toothed rack presents itself as an advantageous alternative: comparing the rack diameter with the piston diameter of the hydraulic cylinder, higher forces can be transmitted at normal pressures of the hydraulic cylinder.



Manufactured acc. to customer specifications: Rack Jack with double sided toothed rack

The Rack Jack with double sided toothed rack is available as a custom-made product according to customer requirements.

In close coordination with the customer, a precise examination of the respective application and a corresponding design and construction of the Rack Jack takes place. The realization of the development takes place on request in prototype construction, in one-off production as well as series.

We are looking forward to receiving your inquiry.



Custom-made Rack Jacks (Round Rack Type)

In addition to our standard product range, we manufacture Rack Jacks according to your requirements. Please send us your inquiry with details of your application; we will advise you regarding design, construction and manufacturing capabilities.

Variations & Customization

- Technical design and complete manufacturing of customized Rack Jacks (in terms of performance, travel speeds, stroke, the connection of multiple Rack Jacks, etc.)
- Individual housing designs
- Pinion shafts, custom-made for different connection options, such as pinion shafts with different inner profiles or design of the shaft ends according to customer requirements and drawing
- Rack lengths and end machining according to customer requirements and drawing
- Rack protection (individually, adapted to stroke length)



Connection type: bevel gearbox with adapter flange.



Rack Jack combined with linear technology to realize the absorption of shear forces.

Service

- Calculation tool
- 3D-CAD data files

can be provided upon request.