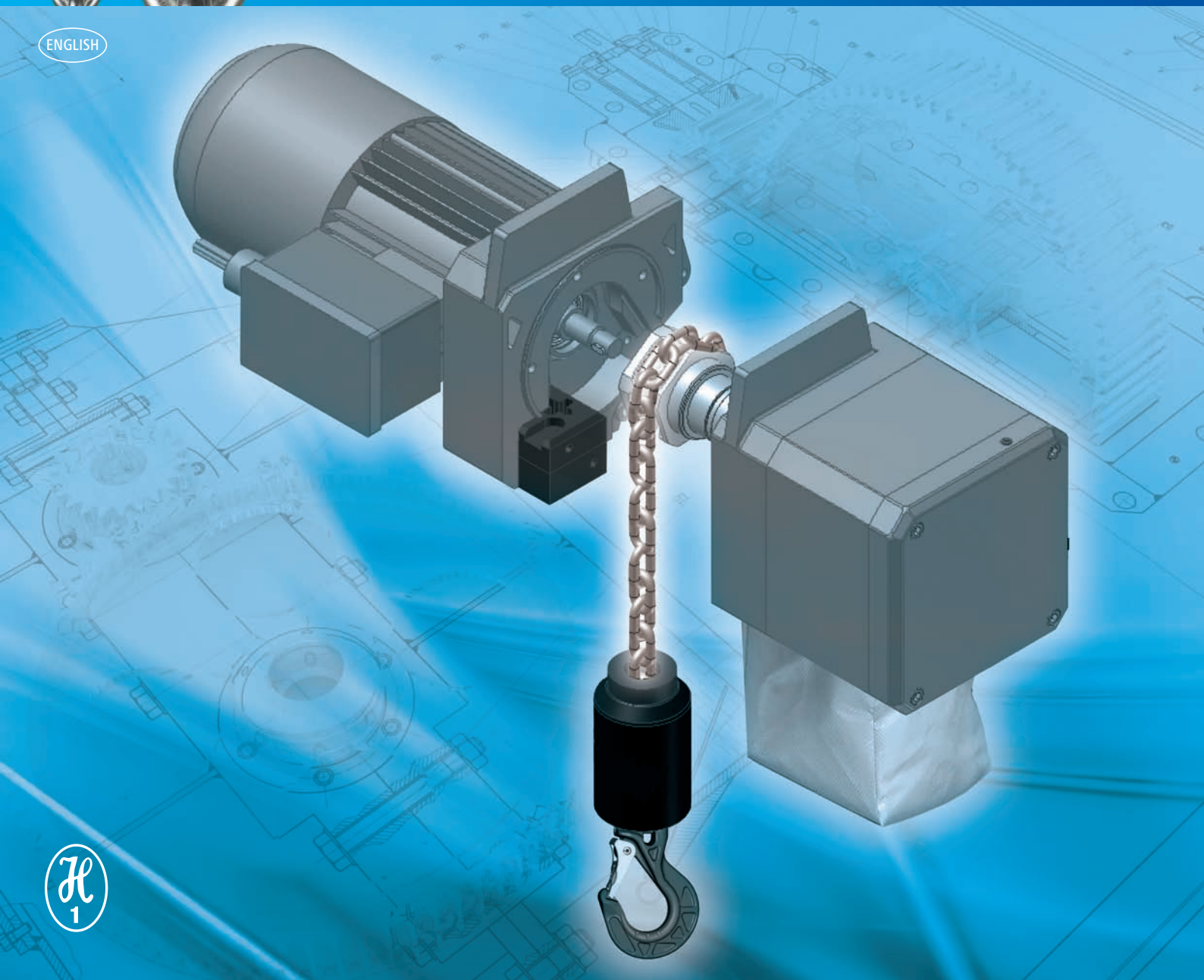
RUD®

HOIST CHAINS

for motor-driven and manual hoists

ENGLISH



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Welcome to RUD

RUD mission statement

RUD is a dynamic, global, and modern family-owned enterprise. We have occupied key positions in the machine construction industry for 135 years, specifically in the areas of forming, welding, heat treatment, surface technology, forging and machining. This is the best possible way to prepare the business for a future as a “hidden champion of the 21st century”.

The RUD think tank

Our RUD hoist chains, mountable lifting accessories and RUD conveyor systems guarantee quality, innovation and safety for lifting, pulling and conveying tasks. Our robust RUD and Erlau anti-skid chains are combined with innovative mounting systems to allow for safe driving when there is snow and ice on the road, and even in the toughest of terrains.

RUD and Erlau tyre protection chains are used to protect the tread and sidewalls of tyres on earth moving vehicles.

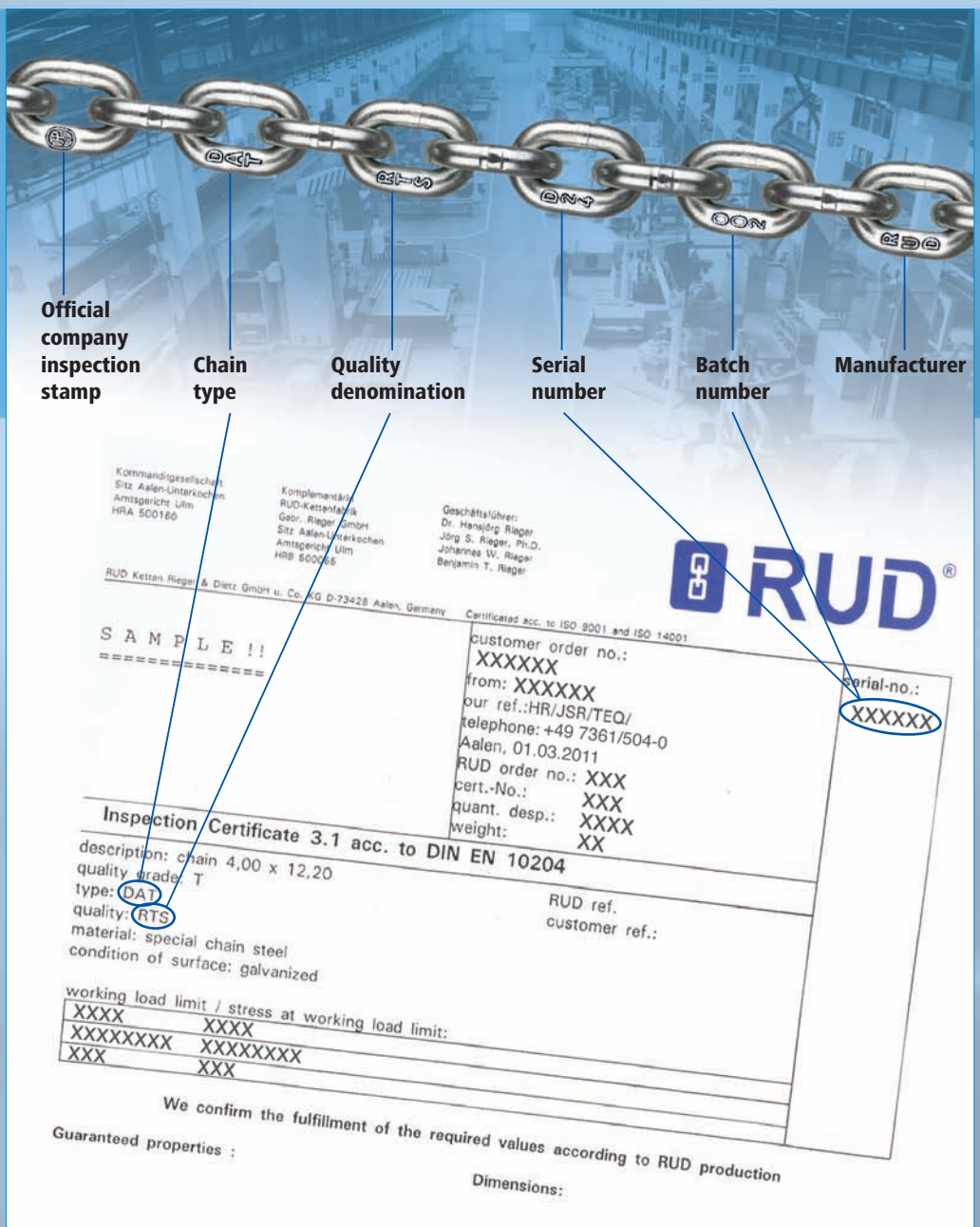
The Erlau outdoor furniture range offers elegant seating in an attractive design. Our Erlau human care products, support and handling systems for sanitary facilities offer great flexibility and individuality.

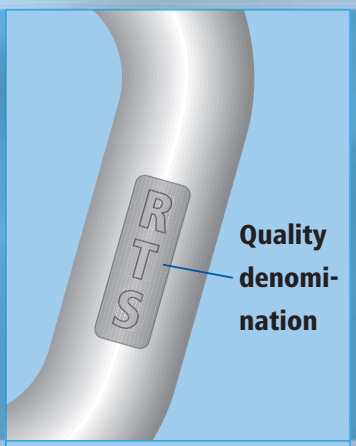
RUD innovation strategy

RUD is setting new technological standards. Our products combine the latest technology with clearly defined environmental management. This means that we are continuously growing, while consistently conserving the resources that are required for that growth. We are always striving for perfection and view the goals we have reached as a basis for new visions.

RUD hoist chains

Chain marking





Safety instructions and instruction manuals can be downloaded from the RUD Portal under www.rud.com

RUD hoist chains – advantages at a glance:

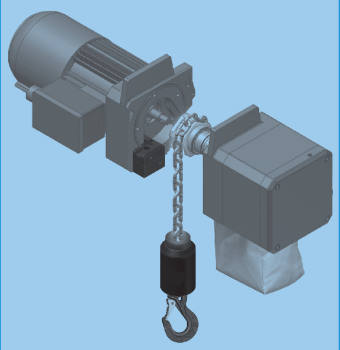
- Uniform surface hardness and hardness depth, particularly in the joints, high resistance to wear, long service life
- Highest dynamic strength, maximum operating safety
- Narrow size tolerances, symmetrical link shape, precision adjustment via take-up wheels
- The chain marking is a pre-condition for a clear proof of safety
- All RUD chains are 100 % calibrated
- Special sizes are also available
- Reliable delivery service
- Made in Germany and produced at the headquarters in Aalen-Unterkochen
- Advice and support around the world from our RUD branch offices
- Cooperation with well-known German universities
- RUD produces the world's smallest and largest hoist chains, which measure 3 x 9 mm and 32 x 90 mm

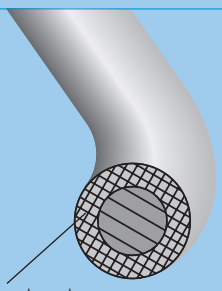
=> We supply all leading OEMs in Europe and around the world with RUD hoist chains that are made in Germany.

RUD hoist chains

DAT type for high wear resistance (EN 818-7-DAT)

For motor-driven hoists





Case-hardened

Quality and designation			RTS	RTD	RTB
Stress at manufacturing proof force	σMPF_{min}	N/mm²	500		
Stress at breaking force	σBF_{min}	N/mm²	800		
Total ultimate elongation	A_{min}	%	10		
Surface hardness according to DIN EN 818-7	d ≤ 6.5 Ø d ≥ 7 Ø	HV 5 HV10	500 - 650		
Case depth in the joint (after macro-etching)	...d ± 0.01 d	mm	≤ Ø 4 / 0.05 Ø 4.1-7 / 0.04 Ø 8-16 / 0.03 ≥ Ø16.1 / 0.02	< Ø8 / 0.05 Ø 8-11.5 / 0.04 ≥ Ø 12 / 0.03	
Fatigue strength		N/mm²	130 ± 80	130 ± 90	130 ± 100

Dimension [mm]	Capacity W_{LL} [kg] according to mechanism group				Manufacturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]	RTS	RTD	RTB
	M3 (1Bm)	**M4** (1Am)	**M5** (2m)	**M6** (3m)					
	Nominal stress: 160 N/mm²	Nominal stress: 140 N/mm²	Nominal stress: 125 N/mm²	Nominal stress: 112 N/mm²					
	Safety factor 5	Safety factor 5.7	Safety factor 6.4	Safety factor 7.1					
3[1] x 9	230	200	180	160	7	11.3	x		
4 x 12	410	350	320	280	12.6	20.1	x	x	x
5 x 15	640	560	500	440	19.6	31.4	x	x	x
5.6 x 17	800	700	630	560	24.6	39.4	x		
6 x 18	920	800	720	640	28.3	45.2	x	x	
6.3 x 19	1000	880	790	710	31.2	49.9	x		
6.3 x 19.1	1000	880	790	710	31.2	49.9	x		
7 x 21	1250	1090	980	870	38.5	61.6	x	x	x
7 x 22	1250	1090	980	870	38.5	61.6	x	x	
7.1 x 20.2	1250	1090	980	870	39.6	63.3	x		x
7.1 x 21.2	1290	1130	1000	900	39.6	63.3	x		
8 x 24	1640	1430	1280	1140	50.3	80.4	x		
9 x 27	2070	1810	1620	1450	63.6	102	x	x	x
10 x 28	2560	2240	2000	1790	78.5	126	x		
10 x 30.2	2560	2240	2000	1790	78.5	126	x		
11 x 31	3100	2700	2420	2160	95	152	x		
11.2 x 34	3200	2800	2500	2240	98.5	157.6	x		
11.2 x 34.4	3200	2800	2500	2240	98.5	157.6	x		
11.3 x 31	3270	2860	2550	2280	100.3	160.5	x	x	x
13 x 36	4330	3780	3380	3030	132.7	212.3	x		x
16 x 45	6550	5730	5120	4590	201	322	x		x
23.5[1] x 66	14100	12370	11000	9900	434	694	x		

Grade DAT / T

Mechanism group ISO 4301-1 (FEM 9.511)	Nominal stress [N/mm²]	Limit stress [N/mm²]
M1 (1Dm)	200	250
M2 (1Cm)	160	225
M3 (1Bm)	160	200
M4 (1Am)	140	180
M5 (2m)	125	160
M6 (3m)	112	140
M7 (4m)	100	125
M8 (5m)	90	112

[1] Dimensions outside of EN 818-7.

Other dimensions on request.

The nominal stresses and the limit stresses may not exceed the stresses specified in the respective mechanism groups.

Operation temperature - 20° C to + 200° C

RUD hoist chains

T type for low/medium wear resistance EN 818-7-T

Quality and designation			RT
Stress at manufacturing proof force	σMPF_{min}	N/mm²	500
Stress at breaking force	σBF_{min}	N/mm²	800
Total ultimate elongation	A_{min}	%	10
Surface hardness according to DIN EN 818-7		HV10	360

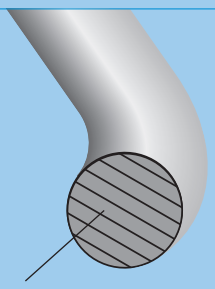
Dimension [mm]	Material number	Capacity W_{LL} [kg] according to mechanism group					Manufacturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]
		Manual (1Dm)	**M3** (1Bm)	**M4** (1Am)	**M5** (2m)	**M6** (3m)		
		Nominal stress: 200 N/mm²	Nominal stress: 160 N/mm²	Nominal stress: 140 N/mm²	Nominal stress: 125 N/mm²	Nominal stress: 112 N/mm²		
		Safety factor 4	Safety factor 5	Safety factor 5.7	Safety factor 6.4	Safety factor 7.1		
3[1] x 9	7989206	280	230	140	180	160	7	11.3
4 x 12	53804	510	410	350	320	280	12.6	20.1
5 x 15	53008	800	640	560	500	440	19.6	31.4
5.6 x 17	57165	1000	800	700	630	560	24.6	39.4
6 x 18	56680	1150	920	800	720	640	28.3	45.2
6 x 18.5	60144	1150	920	800	720	640	28.3	45.2
6,3 x 19	7985347	1270	1010	880	790	710	31.2	49.9
6.3 x 19.1	53012	1270	1010	880	790	710	31.2	49.9
7 x 22	56709	1560	1250	1090	980	870	38.5	61.6
7.1 x 21	53016	1560	1250	1090	980	870	39.6	63.3
7.1 x 20.2	53014	1560	1250	1090	980	870	39.6	63,3
7.1 x 21.2	52693	1560	1250	1090	980	870	40	67
8 x 24	62162	2050	1640	1430	1280	1140	50.3	80.4
9 x 27	55376	2590	2070	1810	1620	1470	63.6	102
10 x 28	7101932	3200	2560	2240	2000	1790	78.5	126
10 x 30	57862	3200	2560	2240	2000	1790	78.5	126
11 x 31	60931	3870	3100	2710	2420	2170	95	152
11.2 x 34	53028	4010	3200	2810	2500	2250	98.5	157.6
13 x 36	53030	5400	4320	3780	3380	3030	132.7	212,3
16 x 45	53017	8150	6550	5730	5110	4590	201	322
22 x 66	7989369	15500	12500	10840	9680	8680	400	630
23.5[1] x 66	7992988	17680	14140	12380	11050	9900	434	694
32[1] x 90	7993904	32790	26200	22950	20480	18360	780	1286

VH version for use in manual hoists ISO 16872

Quality and designation			VH
Stress at manufacturing proof force	σMPF_{min}	N/mm²	625
Stress at breaking force	σBF_{min}	N/mm²	1000
Total ultimate elongation	A_{min}	%	17
Surface hardness according to ISO 16872		HV10	min. 430

Dimension [mm]	Material number	Material number	Capacity W_{LL} [kg]	Manufacturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]
	Surface: natural dark blue	**Surface: Corrud DT**	Nominal stress: 250 N/mm²		
			Safety factor 4		
5 x 15	7900678	7901399	1000	24.5	39.3
6 x 18	7901262	7901400	1440	35.3	56.5
6.3 x 19.1	7900646	7901401	1600	39	62.3
7.1 x 21	7901086	7901402	2000	49.5	79.2
7.1 x 21.2	7900647	7901407	2000	49.5	79.2
8 x 24	7900679	7901403	2500	62.8	101
9 x 27	7900680	7901404	3150	79.5	127
10 x 30	7900925	7901405	4000	98.2	157
10 x 30.2	7901061	7901406	4000	98.2	157

Specially suited for manual hoists



Tempered

Dimensions acc. to DIN 5684-3 (2011) and EN 818-7

[1] Dimensions outside of above mentioned standards.

Other dimensions on request.

The nominal stresses and the limit stresses may not exceed the stresses specified in the respective mechanism groups.

Operation temperature: - 40° C to + 200° C

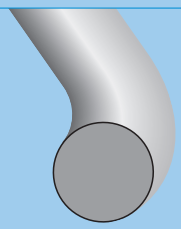
Chains in accordance with ISO 16872 may only be installed/used in manually operated hoists.

Operation temperature: - 10° C bis + 150° C

RUD hoist chains

In rust and acid-resistant quality, similar to DIN 5684, sections 1 and 2

For motor-driven and manual hoists



Without heat treatment

Quality and designation			Grade P RPA	Grade S RSA
Material			AISI 316	
Stress at manufacturing proof force	σMPF_{min}	N/mm²	315	400
Stress at breaking force	σBF_{min}	N/mm²	500	630
Total ultimate elongation	A_{min}	%	15	
Surface hardness in the joint	d ≤ 6,5 Ø d ≤ 7 Ø	HV 5 HV10	ca. 250	

Dimension [mm]	Material number	Grade	Capacity W_{LL} [kg] according to mechanism group					Manu-facturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]
			Manual (1Dm)	**M3** (1Bm)	**M4** (1Am)	**M5** (2m)	**M6** (3m)		
			Nominal stress: ≤ Ø 7 = 160 N/mm² ≥ Ø 8 = 125 N/mm²	Nominal stress: ≤ Ø 7 = 125 N/mm² ≥ Ø 8 = 100 N/mm²	Nominal stress: ≤ Ø 7 = 110 N/mm² ≥ Ø 8 = 90 N/mm²	Nominal stress: ≤ Ø 7 = 100 N/mm² ≥ Ø 8 = 80N/mm²	Nominal stress: ≤ Ø 7 = 90 N/mm² ≥ Ø 8 = 70 N/mm²		
			Safety factor 4	Safety factor 5	Safety factor 5.7	Safety factor 6.4	Safety factor 7.1		
4 x 12	54079	S	400	320	280	250	230	10	16
5 x 15	54100	S	630	500	440	400	360	16	25
6 x 18	54333	S	900	720	630	570	510	22.4	36
6.3 x 19.1	53998	S	1010	790	700	635	570	25	40
7 x 21	54130	S	1250	1000	860	780	700	32	50
8 x 24	58778	P	1250	1000	920	820	710	32	50
9 x 27	58779	P	1600	1250	1160	1000	900	40	63
10 x 28	58780	P	2000	1600	1440	1250	1120	50	80
11.3 x 31	7984841	P	2500	2000	1800	1600	1400	63	100
13 x 36	58784	P	3350	2650	2430	2100	1890	85	132
16 x 45	7988746	P	5000	4000	3680	3270	2860	125	200

Other dimensions on request.

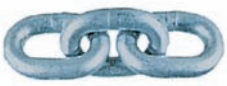
The nominal stresses and the limit stresses may not exceed the stresses specified in the respective mechanism groups.

Caution: Because of the austenitic materials with low hardness, reduction of the nominal stress and good lubrication of the chain will produce a satisfactory service life.
For continuous operation, a nominal stress of $\sigma_{tr} = 80$ N/mm² should not be exceeded for motor-driven hoists.

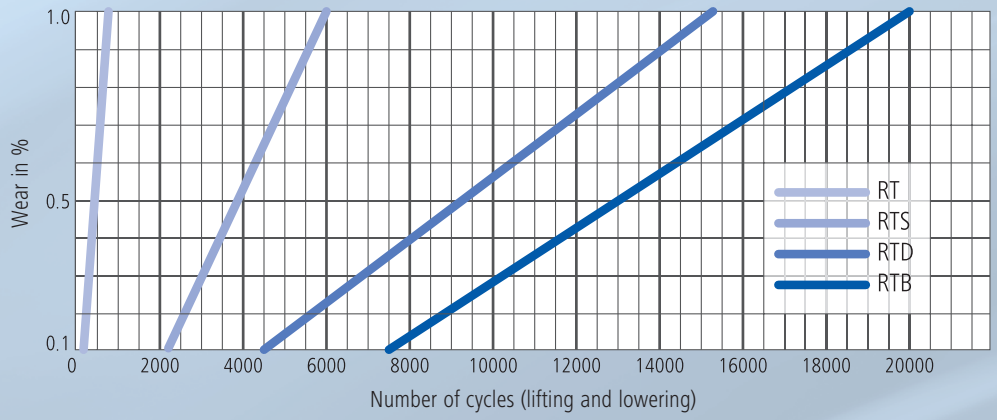
Grades RPA and RSA				
Mechanism group ISO 4301-1 (FEM 9.511)	Nominal stress [N/mm²]		Limit stress [N/mm²]	
	RPA	RSA	RPA	RSA
M1 (1Dm)	125	160	187,5	240
M2 (1Cm)	100	125	138	175
M3 (1Bm)	100	125	125	160
M4 (1Am)	90	112	112	140
M5 (2m)	80	100	100	125
M6 (3m)	70	90	90	112
M7 (4m)	60	80	80	100
M8 (5m)	55	70	70	90

RUD hoist chains

Corrosion protection coatings

Surface	Short description of the surface coating	New condition	After 100 hours: salt spray test
Natural dark blue oil polished	Thick oxide layer with corrosion protection oil		
Phosphated oil polished (POP)	Zinc phosphate with corrosion protection oil (5 µm)		
Blackening (only for tempered chains)	Thick oxide layer with black-grey finish		
Electrolytic galvanised	Electrolytic metal deposition (6-10 µm)		
Corrud coating	Coating process with zinc/aluminium amounts and subsequent burning in (8-10 µm)		

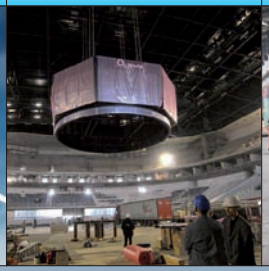
Cycles endured with unlubricated hoist chain



A lot more cycles can be attained through adequate lubrication of the chain and optimal design of the chain drive. An approximate value is up to 15 times more. Lubricant recommendation in the RUD Portal under www.rud.com

Parameter: nominal stress σ_{tr} = 100 N/mm²;
No. of pockets: Z = 5;
Speed: v = 8m/min;
Dry run (chain is degreased);
Single strand

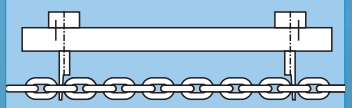
Applications for RUD hoist chains

Wind power stations	Stage technology	Industry	Offshore
			

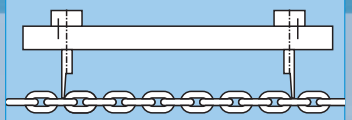
RUD limit gauge for hoist chains

Specially developed for the practitioner for quick detection of the replacement state of wear via external gauging (11t + 2d)

- In case of increases in pitch due to wear or warping
- Measurement can be made at the loaded chain strand
- Measurement device with simple setup
- Easy handling

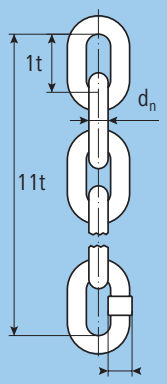


Gauge can be inserted: chain is okay

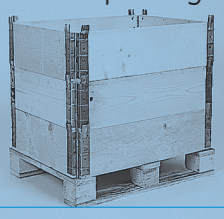


Gauge cannot be inserted: chain is to be discarded when wear >2% bzw. >3%

The measurement device is calibrated for the various hoist types of a manufacturer (both national and international brands) and determines the replacement state of wear.



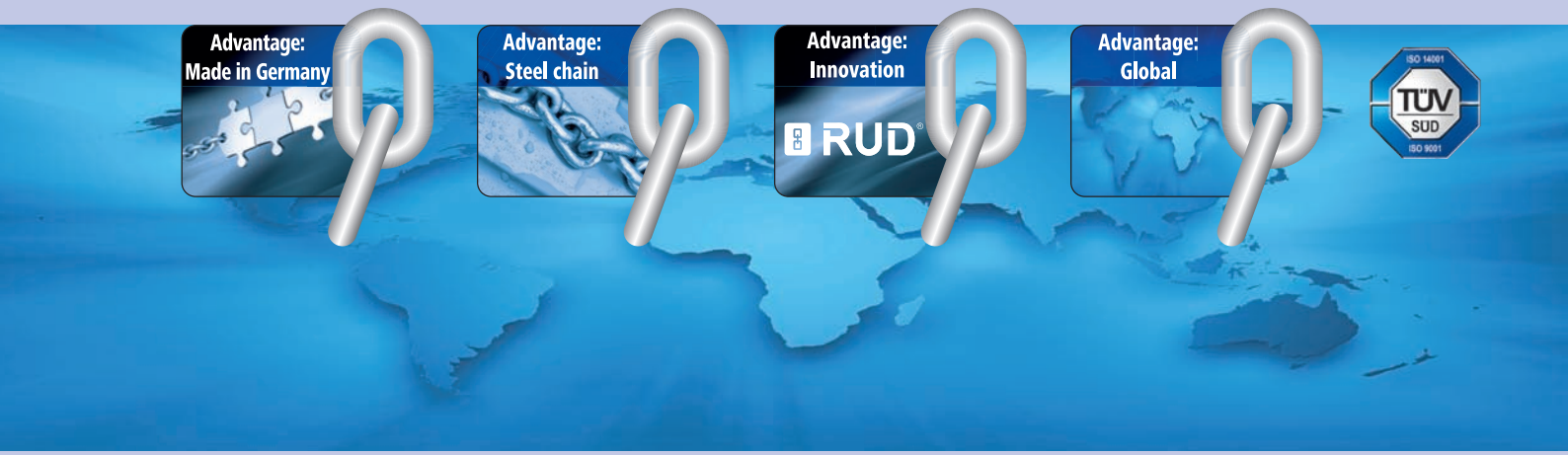
Standard packaging



Special packaging

RUD®

Tradition in Dynamic Innovation



www.hoistchains.com

Global presence and distribution of RUD hoist technology

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Means of communication for other RUD products:
- Lifting accessories and securing equipment
- Military technology
- Conveyor systems
- Drive technology
- Tyre protection chains
- Snow chains

You can visit our Internet site at:
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03.10/???/ Subject to technical changes.