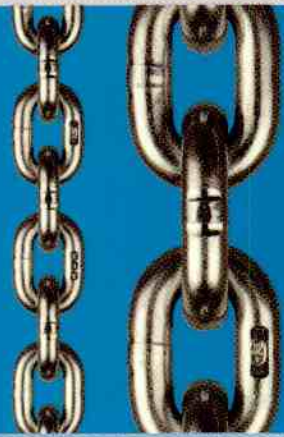
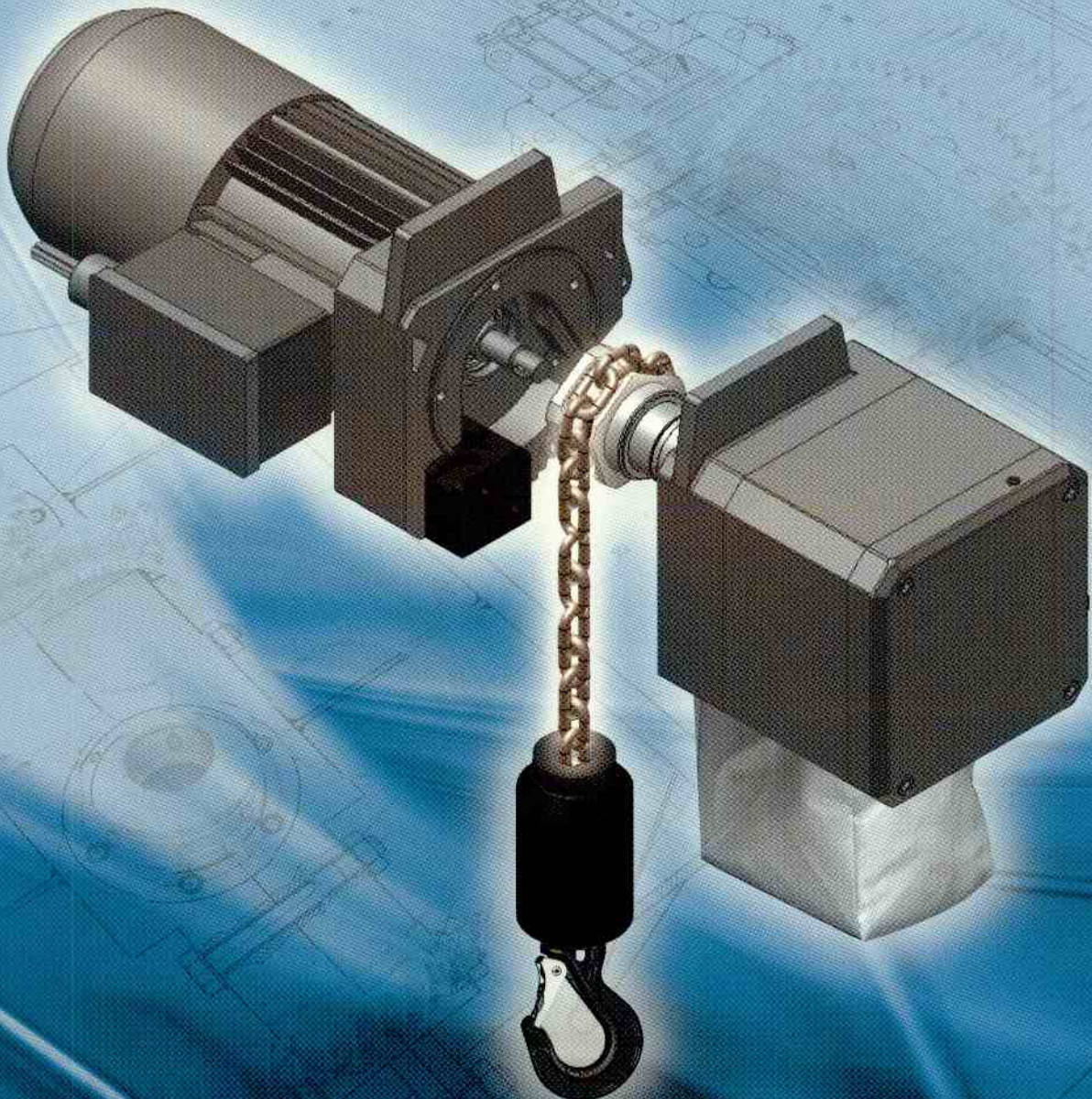


HOIST CHAINS

for motor-driven and manual hoists



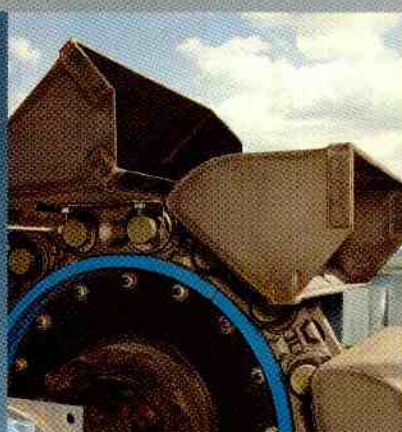
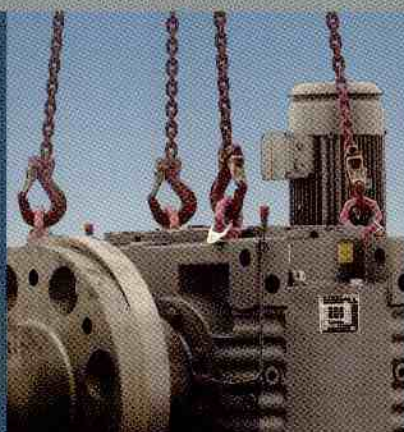
ENGLISH





Welcome to RUD

2



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.



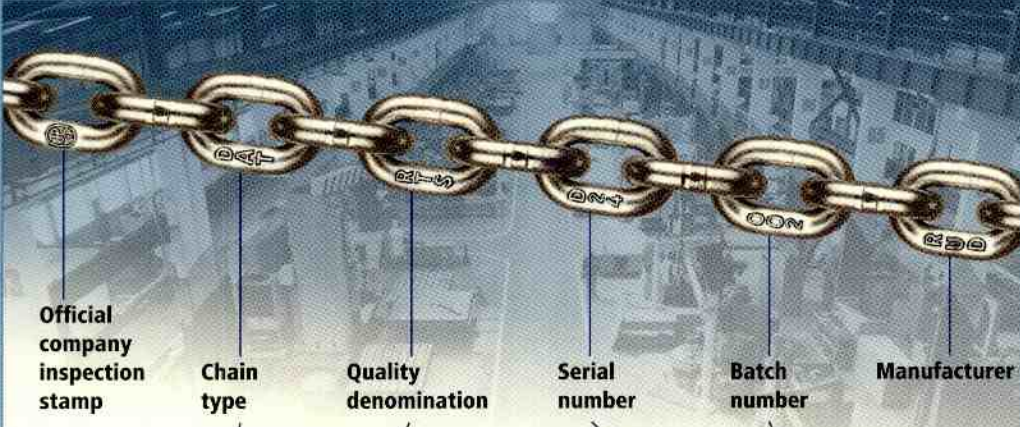
RUD innovation strategy

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



Official company inspection stamp

Chain type

Quality denomination

Serial number

Batch number

Manufacturer

Kommanditgesellschaft
Sitz: Aalen-Unterkochen
Amtsgericht Ulm
HRA 500160

Komplementärin
RUD-Kettenfabrik
Geor. Rieger GmbH
Sitz: Aalen-Unterkochen
Amtsgericht Ulm
HRB 500065

Geschäftsführer:
Dr. Hansjörg Rieger
Jörg S. Rieger, Ph.D.
Johannes W. Rieger
Benjamin T. Rieger

RUD Ketten Rieger & Dietz GmbH u. Co. KG D-73428 Aalen, Germany

RUD®

customer order no.: XXXXXX
from: XXXXXX
our ref.: HR/JSR/TEQ/
telephone: +49 7361/504-0
Aalen, 01.03.2011
RUD order no.: XXX
cert.-No.: XXX
quant. desp.: XXXX
weight: XX

Serial-no.: XXXXXX

Inspection Certificate 3.1 acc. to DIN EN 10204

description: chain 4,00 x 12,20
quality grade: T
type: DAT
quality: RTS
material: special chain steel
condition of surface: galvanized

RUD ref.
customer ref.:

working load limit / stress at working load limit:
XXXX XXXX
XXXXXXXX XXXXXXXX
XXX XXX

We confirm the fulfillment of the required values according to RUD production

Guaranteed properties :

Dimensions:



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

RUD hoist chains – advantages at a glance:

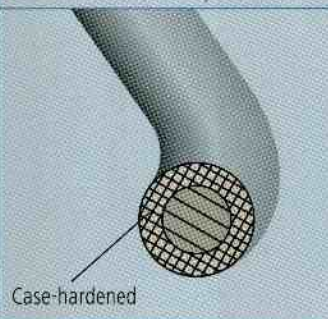
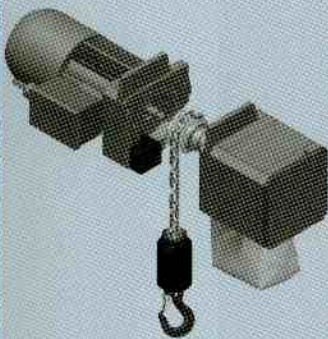
- Uniform surface hardness and hardness depth, particularly in the joints, high resistance to wear, long service life
- Highest dynamic strength, maximum operating safety
- Narrow size tolerances, symmetrical link shape, precision adjustment via take-up wheels
- The chain marking is a pre-condition for 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.



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

For
motor-driven
hoists



Quality and designation			RTS	RTD	RTB
Stress at manufacturing proof force	$\sigma_{MPF_{min}}$	N/mm ²	500		
Stress at breaking force	$\sigma_{BF_{min}}$	N/mm ²	800		
Total ultimate elongation	A_{min}	%	10		
Surface hardness according to DIN EN 818-7	$d \leq 6.5 \varnothing$ $d \geq 7 \varnothing$	HV 5 HV10	500 - 650		
Case depth in the joint (after macro-etching)	$\dots d$ $\pm 0.01 d$	mm	$\leq \varnothing 4 / 0.05$ $\varnothing 4.1-7 / 0.04$ $\varnothing 8-16 / 0.03$ $\geq \varnothing 16.1 / 0.02$	$< \varnothing 8 / 0.05$ $\varnothing 8-11.5 / 0.04$ $\geq \varnothing 12 / 0.03$	
Fatigue strength		N/mm ²	130 ± 80	130 ± 90	130 ± 100

Dimension [mm]	Capacity W_{LL} [kg] according to mechanism group				Manu- facturing 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/mm ²	Nominal stress: 140 N/mm ²	Nominal stress: 125 N/mm ²	Nominal stress: 112 N/mm ²					
	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		

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

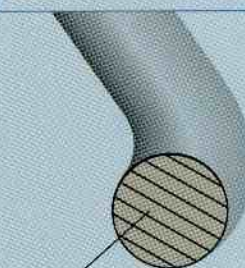
RUD hoist chains

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

Quality and designation			RT
Stress at manufacturing proof force	$\sigma_{MPF_{min}}$	N/mm ²	500
Stress at breaking force	$\sigma_{BF_{min}}$	N/mm ²	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					Manu- facturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]
		Manual (1Dm)	M3 (1Bm)	M4 (1Am)	M5 (2m)	M6 (3m)		
		Nominal stress: 200 N/mm ²	Nominal stress: 160 N/mm ²	Nominal stress: 140 N/mm ²	Nominal stress: 125 N/mm ²	Nominal stress: 112 N/mm ²		
		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

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

VH version for use in manual hoists ISO 16872

Quality and designation			VH
Stress at manufacturing proof force	$\sigma_{MPF_{min}}$	N/mm ²	625
Stress at breaking force	$\sigma_{BF_{min}}$	N/mm ²	1000
Total ultimate elongation	A_{min}	%	17
Surface hardness according to ISO 16872		HV10	min. 430

Dimension [mm]	Material number Surface: natural dark blue	Material number Surface: Corruid DT	Capacity W_{LL} [kg]	Manufacturing proof force MPF_{min} [kN]	Breaking force BF_{min} [kN]
			Nominal stress: 250 N/mm ² 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

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

Operation temperature: - 10° C to + 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	$\sigma_{MPF_{min}}$	N/mm ²	315	400
Stress at breaking force	$\sigma_{BF_{min}}$	N/mm ²	500	630
Total ultimate elongation	A_{min}	%	15	
Surface hardness in the joint	$d \leq 6,5 \varnothing$ $d \leq 7 \varnothing$	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: $\leq \varnothing 7 = 160 \text{ N/mm}^2$ $\geq \varnothing 8 = 125 \text{ N/mm}^2$	Nominal stress: $\leq \varnothing 7 = 125 \text{ N/mm}^2$ $\geq \varnothing 8 = 100 \text{ N/mm}^2$	Nominal stress: $\leq \varnothing 7 = 110 \text{ N/mm}^2$ $\geq \varnothing 8 = 90 \text{ N/mm}^2$	Nominal stress: $\leq \varnothing 7 = 100 \text{ N/mm}^2$ $\geq \varnothing 8 = 80 \text{ N/mm}^2$	Nominal stress: $\leq \varnothing 7 = 90 \text{ N/mm}^2$ $\geq \varnothing 8 = 70 \text{ N/mm}^2$		
			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

Grades RPA and RSA

Mechanism group ISO 4301-1 (FEM 9.511)	Nominal stress [N/mm ²]		Limit stress [N/mm ²]	
	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



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
 $\sigma_{Nz} = 80 \text{ N/mm}^2$ should not be exceeded for
motor-driven hoists.

RUD hoist chains

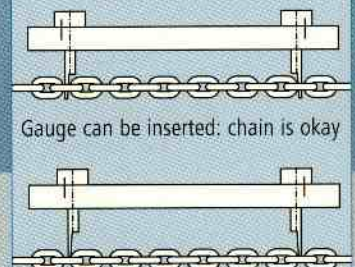
Corrosion protection coatings

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)		
Corrod coating	Coating process with zinc/aluminium amounts and subsequent burning in (8-10 µm)		

RUD limit gauge for hoist chains

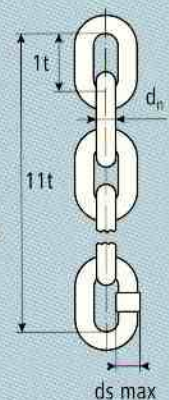
Specially developed for the practitioner for quick detection of the replacement state of wear via external gauging ($11t + 2d$)

- 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

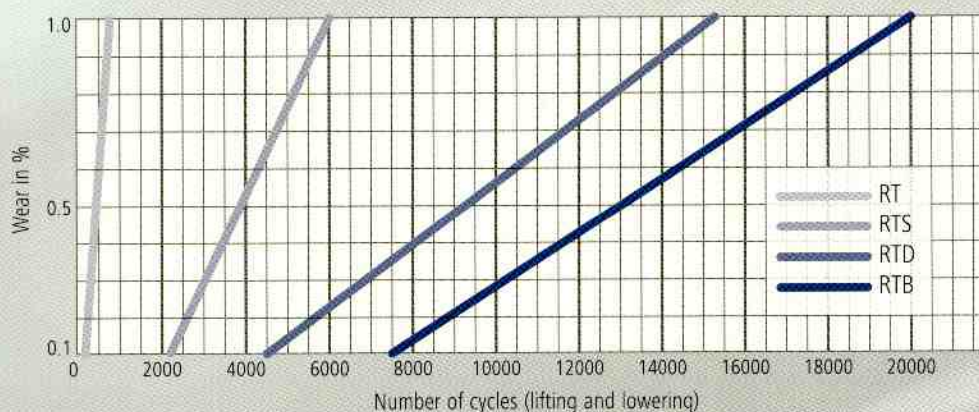


Gauge cannot be inserted: chain is to be discarded when wear >2% bzw. >3%

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.



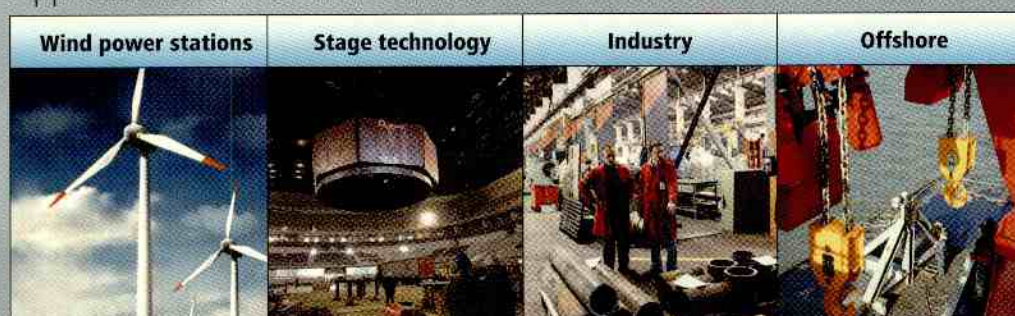
Cycles endured with unlubricated hoist chain



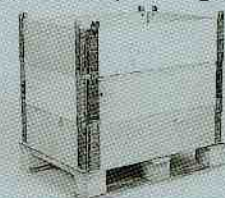
A lot more cycles can be attained through adequate lubrication of the chain and optimal design of the chain drive. An approximate value is up to 15 times more. Lubricant recommendation in the RUD Portal under www.rud.com

Parameter: nominal stress $\sigma_{fl} = 100 \text{ N/mm}^2$;
No. of pockets: $Z = 5$;
Speed: $v = 8 \text{ m/min}$;
Dry run (chain is degreased);
Single strand

Applications for RUD hoist chains



Standard packaging



Special packaging



Advantage:
Made in Germany



Advantage:
Steel chain



Advantage:
Innovation



Advantage:
Global



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:

www.rud.com

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