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**Karnasch**<sup>®</sup>  
PROFESSIONAL TOOLS

## VOLLHARTMETALL REIBAHLEN · MICROREIBAHLEN

## SOLID CARBIDE REAMERS · MICRO REAMERS



2.2

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PROFESSIONAL TOOLS

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Art.	Vollhartmetall Reibahlen / Solid carbide reamers	Material			HSC High-Speed Cutting	HRC < 45	HRC < 50	
					H	P	H	
<b>P</b> 22 1450	Ø 0,200 - 0,595			MICRO GRAIN	284	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>P</b> 22 1452	Ø 0,60 - 3,50			MICRO GRAIN	285	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>H</b> 22 1490	Ø 2,97 - 12,0			MICRO GRAIN	286	<input checked="" type="checkbox"/>		

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- Lagerware / Stock tool
- Keine Lagerware, Lieferzeit und Preis auf Anfrage  
No stock tool. Price and delivery on request
- ◻ Lieferzeit kurzfristig da Rohlinglager vorhanden  
Short delivery deadline possible then blanks are on stock available

- 🏷 Sonderpreis. Solange Vorrat reicht. Rückgabe nicht möglich.  
Special price. While stocks last. Return not possible.
- 📅 2-3 Arbeitstage Lieferzeit / 2-3 work days delivery time

HRC < 55	HRC < 60	HRC < 65	HRC < 70	STAHL <small>stahl</small> <small>&lt; 800 N/mm²</small>	INOX Edelstahl <small>STAINLESS STEEL</small>	INCONEL HASTELLOY TITANIUM	GJL	GJS	GTW GTS	NE METALLE <small>non-ferrous</small>	kurz- spanend <small>short chip</small>	lang- spanend <small>long chip</small>	MIT INNEN- KÜHLUNG <small>with internal cooling</small>	OHNE INNEN- KÜHLUNG <small>without internal cooling</small>	DIN 6535 Form HA	DIN 6535 Form HE	DIN 6535 Form HAK	DIN 6535 Form HEK
H	H	H	H	P	M	S	K	K	K	N								
				✓	✓	✓	✓	✓		✓	✓	✓		✓	✓			
				✓	✓		✓	✓		✓	✓	✓		✓	✓			
✓	✓	✓	✓				✓	✓			✓			✓	✓			

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9



10

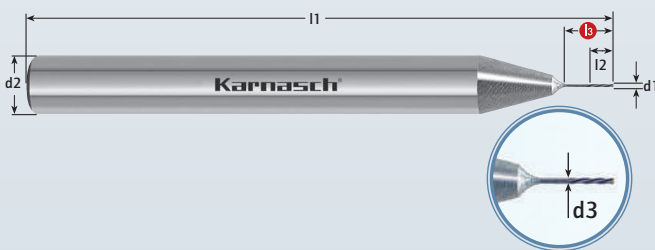
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## 22 1450

Miniatur-Vollhartmetall-High-Speed-Präzisionsreibahlen HSR. Linksspirale, rechtsschneidend  
 Miniature Micro Grain high-speed reamers / HSR. Left hand spiral fluted, right hand cutting



<b>HRC &lt; 45</b>	<b>Alu-minium</b>
<b>INOX</b> stainless steel < 900 N/mm <sup>2</sup> ferritic	<b>MESSING</b> brass
<b>INOX</b> stainless steel > 900 N/mm <sup>2</sup> martensitic	<b>Kupfer</b> copper
<b>INOX</b> stainless steel < 900 N/mm <sup>2</sup> austenitic	<b>kurz-spanend</b> short chip
<b>GG/G</b> cast iron	<b>lang-spanend</b> long chip
<b>TITAN TITANIUM</b> < 1100 N/mm <sup>2</sup>	



<b>MICRO GRAIN</b>	<b>KARNASCH NORM</b>
<b>SPEZIAL</b> SPECIAL	<b>DIN 6535</b> Form HA
	<b>HSR</b> HIGH SPEED REAMERS
	<b>POLIERT</b> POLISHED

Schnittdaten  
Cutting data

Zeichnungen  
Drawings



1399

DXF/STEP

Art.	d1 ± 0,001	l3	d2 h6	l1	l2 /- 0,1	d3 -0,001	Z
22 1450 0200	0,200	2,0	3,0	40	1,0	0,199	4
22 1450 0205	0,205	2,0	3,0	40	1,0	0,204	4
22 1450 0210	0,210	2,0	3,0	40	1,0	0,209	4
22 1450 0215	0,215	2,0	3,0	40	1,0	0,214	4
22 1450 0225	0,225	2,0	3,0	40	1,0	0,224	4
22 1450 0230	0,230	2,0	3,0	40	1,0	0,229	4
22 1450 0235	0,235	2,0	3,0	40	1,0	0,234	4
22 1450 0240	0,240	2,0	3,0	40	1,0	0,239	4
22 1450 0245	0,245	2,0	3,0	40	1,0	0,244	4
22 1450 0250	0,250	2,5	3,0	40	1,2	0,249	4
22 1450 0255	0,255	2,5	3,0	40	1,2	0,254	4
22 1450 0260	0,260	2,5	3,0	40	1,2	0,259	4
22 1450 0265	0,265	2,5	3,0	40	1,2	0,264	4
22 1450 0270	0,270	2,5	3,0	40	1,2	0,269	4
22 1450 0275	0,275	2,5	3,0	40	1,2	0,274	4
22 1450 0280	0,280	2,5	3,0	40	1,2	0,279	4
22 1450 0285	0,285	2,5	3,0	40	1,2	0,284	4
22 1450 0290	0,290	2,5	3,0	40	1,2	0,289	4
22 1450 0295	0,295	2,5	3,0	40	1,2	0,294	4
22 1450 0300	0,300	3,0	3,0	40	1,5	0,299	4
22 1450 0305	0,305	3,0	3,0	40	1,5	0,304	4
22 1450 0310	0,310	3,0	3,0	40	1,5	0,309	4
22 1450 0315	0,315	3,0	3,0	40	1,5	0,314	4
22 1450 0320	0,320	3,0	3,0	40	1,5	0,319	4
22 1450 0325	0,325	3,0	3,0	40	1,5	0,324	4
22 1450 0330	0,330	3,0	3,0	40	1,5	0,329	4
22 1450 0335	0,335	3,0	3,0	40	1,5	0,334	4
22 1450 0340	0,340	3,0	3,0	40	1,5	0,339	4
22 1450 0345	0,345	3,0	3,0	40	1,5	0,344	4
22 1450 0350	0,350	3,5	3,0	40	1,8	0,349	4
22 1450 0355	0,355	3,5	3,0	40	1,8	0,354	4
22 1450 0360	0,360	3,5	3,0	40	1,8	0,359	4
22 1450 0365	0,365	3,5	3,0	40	1,8	0,364	4
22 1450 0370	0,370	3,5	3,0	40	1,8	0,369	4
22 1450 0375	0,375	3,5	3,0	40	1,8	0,374	4
22 1450 0380	0,380	3,5	3,0	40	1,8	0,379	4
22 1450 0385	0,385	3,5	3,0	40	1,8	0,384	4
22 1450 0390	0,390	3,5	3,0	40	1,8	0,389	4
22 1450 0395	0,395	3,5	3,0	40	1,8	0,394	4

Art.	d1 ± 0,001	l3	d2 h6	l1	l2 /- 0,1	d3 -0,001	Z
22 1450 0400	0,400	4,0	3,0	40	2,0	0,399	4
22 1450 0405	0,405	4,0	3,0	40	2,0	0,404	4
22 1450 0410	0,410	4,0	3,0	40	2,0	0,409	4
22 1450 0415	0,415	4,0	3,0	40	2,0	0,414	4
22 1450 0420	0,420	4,0	3,0	40	2,0	0,419	4
22 1450 0425	0,425	4,0	3,0	40	2,0	0,424	4
22 1450 0430	0,430	4,0	3,0	40	2,0	0,429	4
22 1450 0435	0,435	4,0	3,0	40	2,0	0,434	4
22 1450 0445	0,445	4,0	3,0	40	2,0	0,444	4
22 1450 0450	0,450	4,0	3,0	40	2,0	0,449	4
22 1450 0455	0,455	4,0	3,0	40	2,0	0,454	4
22 1450 0460	0,460	4,0	3,0	40	2,0	0,459	4
22 1450 0465	0,465	4,0	3,0	40	2,0	0,464	4
22 1450 0470	0,470	4,0	3,0	40	2,0	0,469	4
22 1450 0475	0,475	4,0	3,0	40	2,0	0,474	4
22 1450 0480	0,480	4,0	3,0	40	2,0	0,479	4
22 1450 0485	0,485	4,0	3,0	40	2,0	0,484	4
22 1450 0490	0,490	4,0	3,0	40	2,0	0,489	4
22 1450 0495	0,495	4,0	3,0	40	2,0	0,494	4
22 1450 0505	0,505	5,0	3,0	40	2,4	0,504	4
22 1450 0510	0,510	5,0	3,0	40	2,4	0,509	4
22 1450 0515	0,515	5,0	3,0	40	2,4	0,514	4
22 1450 0520	0,520	5,0	3,0	40	2,4	0,519	4
22 1450 0525	0,525	5,0	3,0	40	2,4	0,524	4
22 1450 0530	0,530	5,0	3,0	40	2,4	0,529	4
22 1450 0535	0,535	5,0	3,0	40	2,4	0,534	4
22 1450 0540	0,540	5,0	3,0	40	2,4	0,539	4
22 1450 0545	0,545	5,0	3,0	40	2,4	0,544	4
22 1450 0550	0,550	5,0	3,0	40	2,4	0,549	4
22 1450 0555	0,555	5,0	3,0	40	2,4	0,554	4
22 1450 0560	0,560	5,0	3,0	40	2,4	0,559	4
22 1450 0565	0,565	5,0	3,0	40	2,4	0,564	4
22 1450 0570	0,570	5,0	3,0	40	2,4	0,569	4
22 1450 0575	0,575	5,0	3,0	40	2,4	0,574	4
22 1450 0580	0,580	5,0	3,0	40	2,4	0,579	4
22 1450 0585	0,585	5,0	3,0	40	2,4	0,584	4
22 1450 0590	0,590	5,0	3,0	40	2,4	0,589	4
22 1450 0595	0,595	5,0	3,0	40	2,4	0,594	4

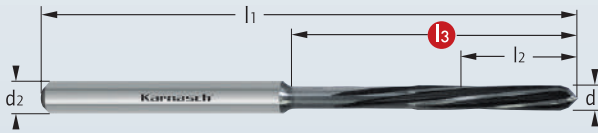
% Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.  
 Special price / sale article. While stocks last.

Miniatur- Vollhartmetall- Präzisionsreibahlen HPC. Linksspirale, rechtsschneidend  
 Miniature Micro Grain high-speed reamers / HPC. Left hand spiral fluted, right hand cutting



22 1452

- HRC < 45** MESSING brass
- INOX** stainless steel < 900 N/mm<sup>2</sup> ferritic KUPFER copper
- INOX** stainless steel > 900 N/mm<sup>2</sup> martensitic Gold gold
- INOX** stainless steel < 900 N/mm<sup>2</sup> austenitic kurzspanend short chip
- GG/G** cast iron langspanend long chip
- Aluminium**



Zwischenabmessungen und Sondertoleranzen sind auf Anfrage kurzfristig Lieferbar.

Intermediate sizes and special tolerances are available at short notice on request.

<b>MICRO GRAIN</b>	KARNASCH NORM
<b>SPEZIAL</b> SPECIAL	Form HA
	30° 7°
	<b>HPC</b>
	<b>POLIERT</b> POLISHED

Schnittdaten  
Cutting data

1399

Art.	d1		l3	d2	l1	l2	Z
22 1452 0080	0,80	+0,003	10	0,80	34	7	4
22 1452 0090	0,90	+0,003	10	0,90	34	7	4
22 1452 0098	0,98	+0,004	21	4,0	50	6	3
22 1452 0101	1,01	+0,004	21	4,0	50	6	3
22 1452 0102	1,02	+0,004	21	4,0	50	6	3
22 1452 0103	1,03	+0,004	21	4,0	50	6	3
22 1452 0160	1,60 H7		21	4,0	50	12	3
22 1452 0201	2,01	+0,004	21	4,0	50	12	4
22 1452 0248	2,48	+0,004	31	4,0	60	16	4
22 1452 0249	2,49	+0,004	31	4,0	60	16	4
22 1452 0250	2,50 H7		31	4,0	60	16	4
22 1452 0280	2,80 H7		35	4,0	63	16	6
22 1452 0297	2,97	+0,004	35	4,0	63	16	6
22 1452 0298	2,98	+0,004	35	4,0	63	16	6
22 1452 0302	3,02	+0,004	35	4,0	63	16	6
22 1452 0303	3,03	+0,004	35	4,0	63	16	6

Sonderpreis / Sale Artikel. Lieferbar solange Vorrat.  
 Special price / sale article. While stocks last.



22 1490

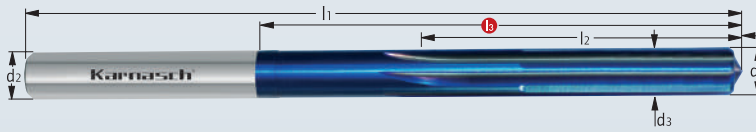
Vollhartmetall Maschinenreibahle für die Hartbearbeitung HHC, < 67 HRC, gerade genutet, rechtsschneidend  
Micro grain machine reamers for high hard material HHC < 67 HRC straight fluted, right hand cut



HRC  
55-67

GJL

GJS



<b>MICRO GRAIN</b>	KARNASCH NORM
<b>SPEZIAL SPECIAL</b>	DIN 6535 Form HA
	30° 0°
	<b>HHC</b>
	<b>FX-70</b>

Art.	d1 H7	l3	d2 h7	l2	l1	Z
22 1490 0297	• 2,97	30	4	16	65	4
22 1490 0298	• 2,98	30	4	16	65	4
22 1490 0299	• 2,99	30	4	16	65	4
22 1490 0300	• 3,00	30	4	16	65	4
22 1490 0301	• 3,01	30	4	16	65	4
22 1490 0302	• 3,02	30	4	16	65	4
22 1490 0303	• 3,03	30	4	16	65	4
22 1490 0397	• 3,97	40	4	20	75	4
22 1490 0398	• 3,98	40	4	20	75	4
22 1490 0399	• 3,99	40	4	20	75	4
22 1490 0400	• 4,00	40	4	20	75	4
22 1490 0401	• 4,01	40	4	20	75	4
22 1490 0402	• 4,02	40	4	20	75	4
22 1490 0403	• 4,03	40	4	20	75	4
22 1490 0497	• 4,97	50	6	25	92	6
22 1490 0498	• 4,98	50	6	25	92	6
22 1490 0499	• 4,99	50	6	25	92	6
22 1490 0500	• 5,00	50	6	25	92	6
22 1490 0501	• 5,01	50	6	25	92	6
22 1490 0502	• 5,02	50	6	25	92	6
22 1490 0503	• 5,03	50	6	25	92	6
22 1490 0597	• 5,97	50	6	25	92	6
22 1490 0598	• 5,98	50	6	25	92	6
22 1490 0599	• 5,99	50	6	25	92	6
22 1490 0600	• 6,00	50	6	25	92	6
22 1490 0601	• 6,01	50	6	25	92	6
22 1490 0602	• 6,02	50	6	25	92	6
22 1490 0603	• 6,03	50	6	25	92	6
22 1490 0797	• 7,97	75	8	30	115	6
22 1490 0798	• 7,98	75	8	30	115	6
22 1490 0799	• 7,99	75	8	30	115	6
22 1490 0800	• 8,00	75	8	30	115	6
22 1490 0801	• 8,01	75	8	30	115	6
22 1490 0802	• 8,02	75	8	30	115	6
22 1490 0803	• 8,03	75	8	30	115	6
22 1490 0997	• 9,97	85	10	40	130	6
22 1490 0998	• 9,98	85	10	40	130	6
22 1490 0999	• 9,99	85	10	40	130	6
22 1490 1000	• 10,00	85	10	40	130	6
22 1490 1001	• 10,01	85	10	40	130	6
22 1490 1002	• 10,02	85	10	40	130	6
22 1490 1003	• 10,03	85	10	40	130	6
22 1490 1197	• 11,97	100	12	45	150	6
22 1490 1198	• 11,98	100	12	45	150	6
22 1490 1199	• 11,99	100	12	45	150	6
22 1490 1200	• 12,00	100	12	45	150	6
22 1490 1201	• 12,01	100	12	45	150	6
22 1490 1202	• 12,02	100	12	45	150	6
22 1490 1203	• 12,03	100	12	45	150	6

Schnittdaten Cutting data	Zeichnungen Drawings
1399	DXF/STEP

Zwischenabmessungen auf Anfrage lieferbar / Intermediate dimensions available on request