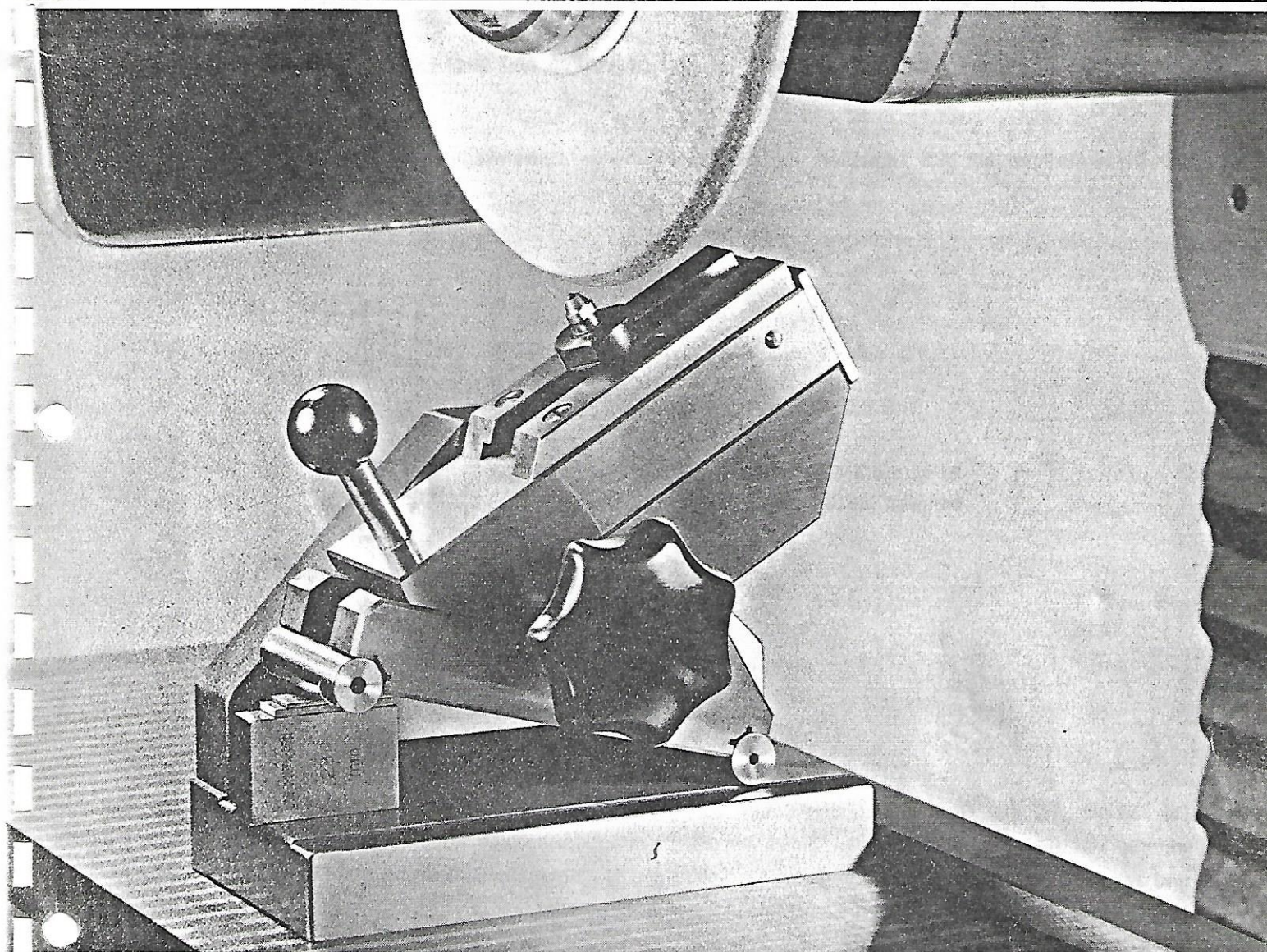


BEDIENUNGSANLEITUNG
SINUS-WINKEL ABRICHTAPPARAT
=====

WA 45

KUNIG



Sinus-Winkel-Abrichtapparat WA 45

Technische Daten:

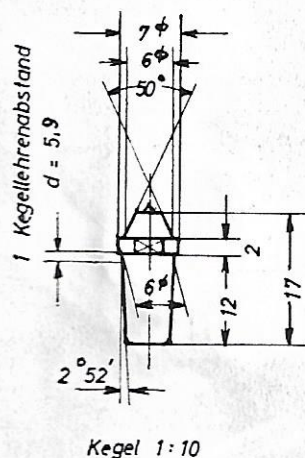
Grundstellung	Grad	45
Gesamt-Einstellbereich	Grad	0 – 90
Sinusbasis	mm	100
Länge der Grundplatte	mm	140 + 0,005
Größter Abdrehweg	mm	45
Grundfläche	mm	140 × 70
Gewicht	kg	4,75

Der verlangte Winkel wird mit Endmaßen nach einer Tabelle eingestellt, die wir mitliefern.

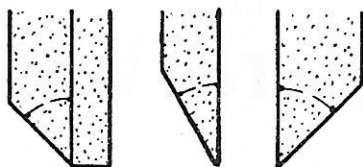
Die Gleitführungen des Schiebers sind gehärtet und geschliffen und gegen das Eindringen von Schleifstaub abgedeckt.

Der Diamanträger läßt sich verstellen, um möglichst günstige Abdrehwege zu erzielen.

Es wird ein Abdrehdiamant FA 42 – 12 benötigt (ca. 0,3 Karat) – siehe Skizze.

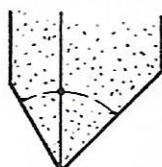


Die Grundplatte des Gerätes hat eine Länge von genau $140 \pm 0,005$ mm. Dadurch wird neben der üblichen Anwendbarkeit (Beispiel I und II) des Sinus-Winkel-Abrichtapparates eine neue Profilier- und Schleiftechnik möglich, und zwar in Verbindung mit der Längsanschlagleiste des Magnetspanntisches und des Meßsystems für die Position des Querschlittens (Beispiel III), die nachfolgend beschrieben wird.



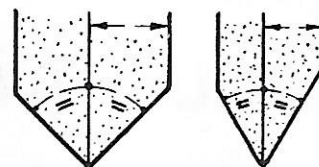
I

Winkel einseitig
rechts oder links.



II

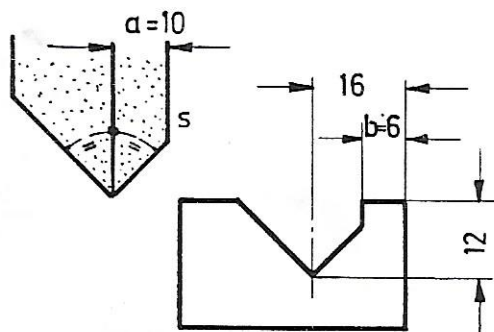
Zwei verschiedene
Winkel



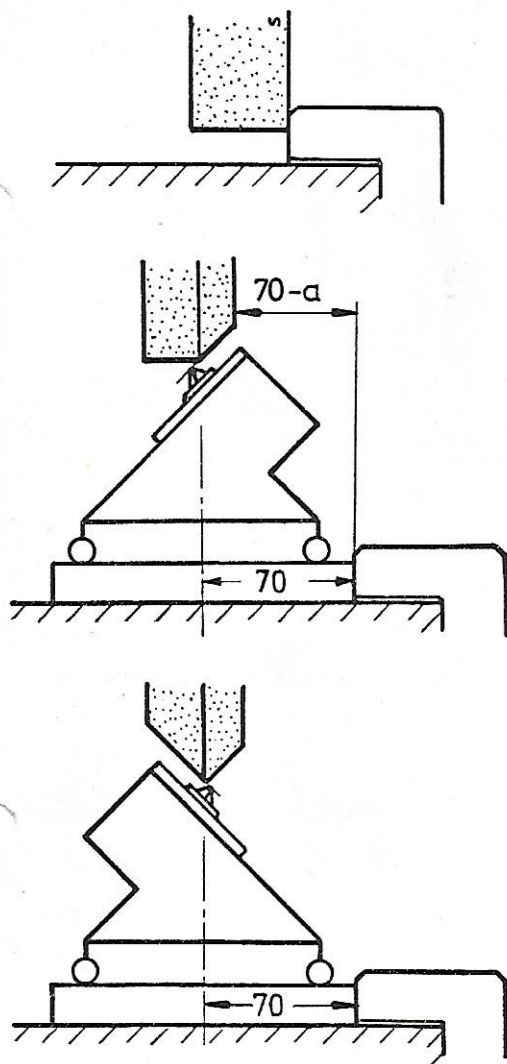
III

Zwei gleiche Winkel
mit Bezug zur Seiten-
fläche der Schleifscheibe.

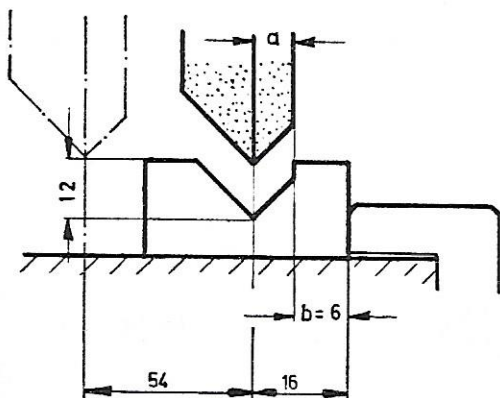
Arbeitsbeispiel gültig für eine Form nach Skizze III



Profiliervorgang



Schleifvorgang



Eine Stirnseite „s“ der Schleifscheibe ist plan abgerichtet, oder die genaue Breite der Schleifscheibe ist hergestellt (mit Seiten-Abrichtapparat NA 50).

1. Antasten der Anschlagleiste am Magnetspanntisch mit der Stirnfläche der Schleifscheibe. Meßsystem nullen.
2. Einstellen des Sinus-Winkel-Abrichtapparates WA 45 auf den gewünschten Winkel nach Tabelle.
3. Einfahren des Quertisches nach Meßsystem auf die Profilerposition
 $= 70 - a = 60 \text{ mm}$
4. Mit Sinus-Winkel-Abrichtapparat WA 45 – an Längsanschlagleiste des Magnetspanntisches angelegt – abrichten der rechten Seite an der Schleifscheibe.
5. Nach Umschlag des Sinus-Winkel-Abrichtapparates WA 45 – an Längsanschlagleiste des Magnetspanntisches angelegt – abrichten der linken Seite an der Schleifscheibe, unter Beibehaltung der Quertisch- und Höhenposition.
 Das Maß „a“ ist durch diesen Vorgang erreicht.
6. Einfahren des Quertisches aus der Profilerposition in die Schleifposition
 $b = 6 \text{ mm}$
7. Werkstück am Längsanschlag des Magnetspanntisches auf Tiefe schleifen.
 Das Maß „b“ ist durch diesen Vorgang erreicht.

Wenn in Ausnahmefällen stumpfe oder spitze symmetrische Winkel abgerichtet werden müssen, bitten wir das Zusatzblatt WA 45 / Z bei uns anzufordern.

A n l e i t u n g

Die Einstellung der Winkel geschieht beim Sinus-Winkel-Abdrehapparat WA 45 nach dem Sinus-Prinzip. In der Grundstellung ist der Diamantschieber um 45° geneigt, d.h., der erzeugte Scheibenwinkel ist genau $\alpha = \alpha_1 = 45^\circ$. Die an beiden Enden des Trägers sich befindenden Auflagezylinder aber liegen in horizontaler Ebene (Bild 1). Bei gelöstem Spannsterne wird nun das Endmass für den gewünschten Scheibenwinkel vorne oder hinten (im folgenden als links oder rechts im Bild bezeichnet) eingelegt, für Scheibenwinkel von $\alpha = 0^\circ - 45^\circ$ rechts (Bild 2) und für Scheibenwinkel von $\alpha_1 = 45^\circ - 90^\circ$ links (Bild 3),

In den Tabellen ist die Endmasshöhe h mm in Abhängigkeit der gewünschten Scheibenwinkel angegeben. Man findet die vollen Winkelgrade für Scheibenwinkel von $= 0^\circ - 45^\circ$ in der obersten Spalte, für $\alpha_1 = 45^\circ - 90^\circ$ in der untersten. Die dazugehörigen Winkel-Minuten findet man von $0' - 30'$, bzw. von $30' - 60'$ für Winkel α links und für Winkel α_1 rechts aussen.

Bild 1

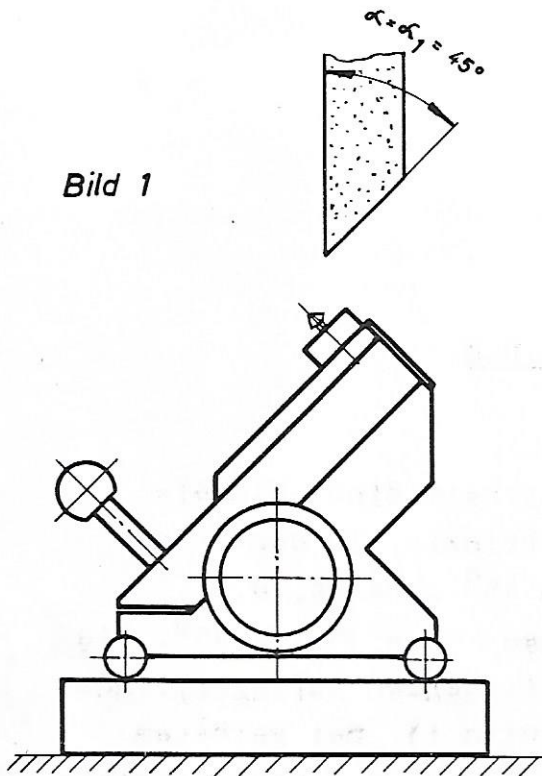


Bild 2

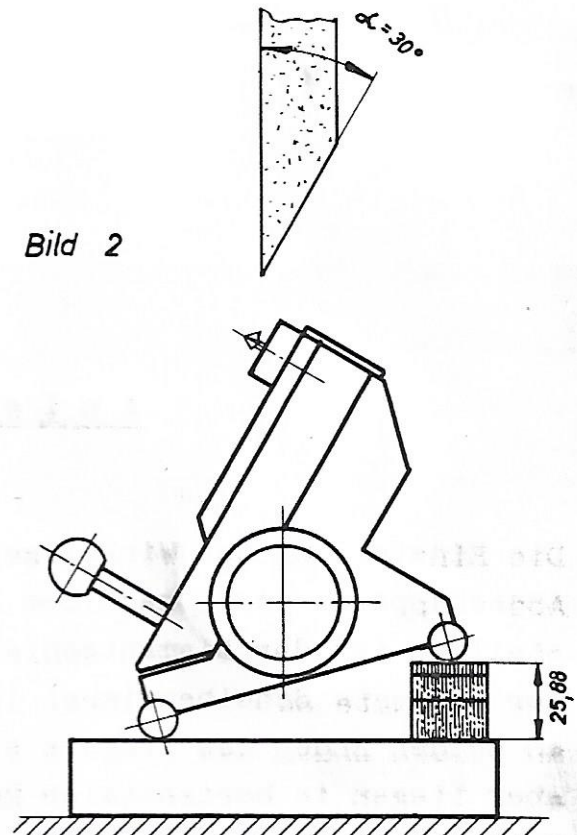


Bild 3

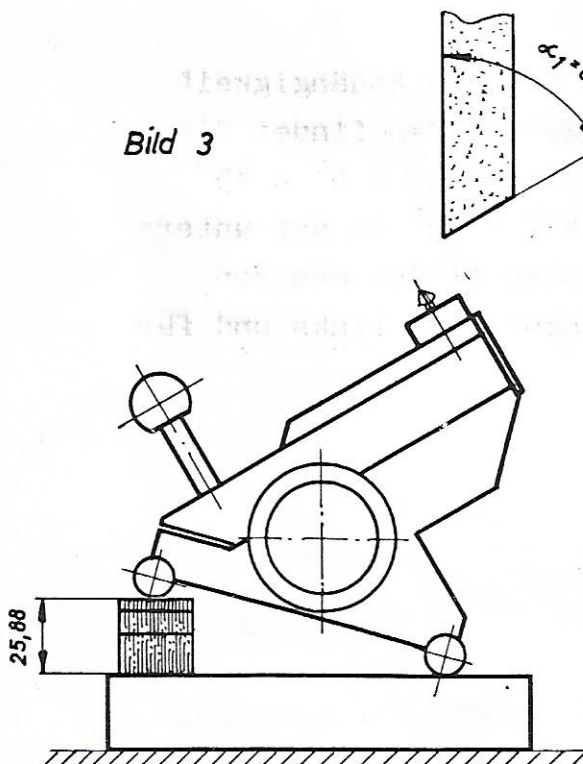
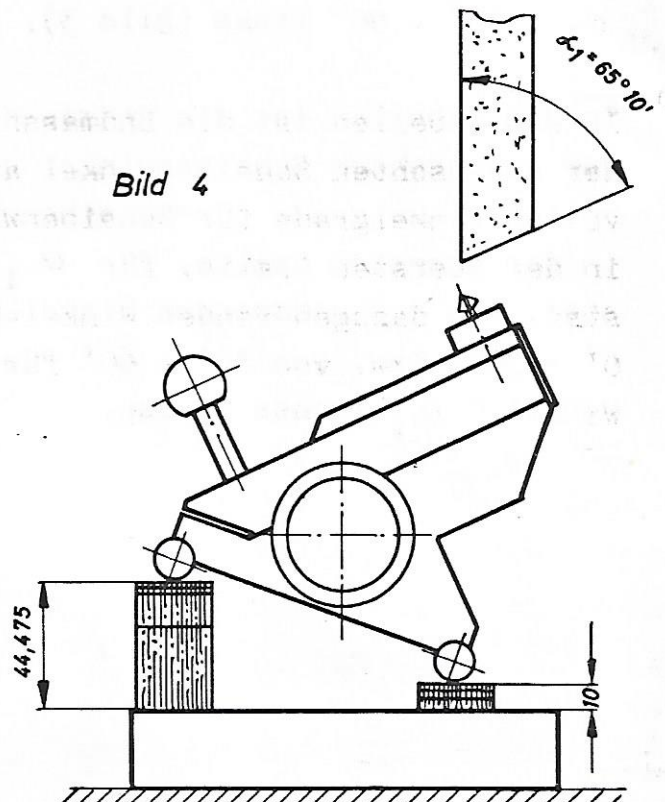


Bild 4



Beispiele

- I. Gewünschter Scheibenwinkel 30° ,
gesucht Endmasshöhe h:

Man sucht also unter α oben die Spalte 30° ,
und findet die Endmasshöhe $h = 25,8819$ mm.
Einlegen rechts wie Bild 2 zeigt.

- II. Gewünschter Scheibenwinkel 60°
gesucht Endmasshöhe h:

Man sucht unter α_1 unten die Spalte 60° ,
und findet die Endmasshöhe $h = 25,8819$ mm.
Einlegen links wie Bild 3 zeigt.

- III. Gewünschter Scheibenwinkel $65^{\circ} 10'$:

Man findet wie oben beschrieben unter α_1 die Endmass-
höhe $h = 34,4752$ mm.

Wenn aber aus den einzelnen Endmassen diese Höhe nicht
zusammengestellt werden kann, sondern nur 44,475 mm,
dann legt man 44,475 mm links und die Differenz von
10 mm rechts ein und erhält so den gewünschten Winkel
(Bild 4).

Gez.: Dat.

Gepr.:

K. JUNG
G. m. b. H.
Göppingen

Sinus-Winkelabdrehsapparat
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	0°	1°	2°	3°	4°	
0'	70,7107	69,4658	68,1998	66,9131	65,6059	60'
1'	70,6901	69,4449	68,1786	66,8914	65,5839	59'
2'	70,6695	69,4240	68,1573	66,8698	65,5620	58'
3'	70,6489	69,4030	68,1360	66,8482	65,5400	57'
4'	70,6284	69,3821	68,1147	66,8265	65,5180	56'
5'	70,6078	69,3611	68,0934	66,8049	65,4961	55'
6'	70,5872	69,3402	68,0721	66,7833	65,4741	54'
7'	70,5665	69,3192	68,0508	66,7616	65,4521	53'
8'	70,5459	69,2983	68,0295	66,7399	65,4301	52'
9'	70,5253	69,2773	68,0081	66,7183	65,4081	51'
10'	70,5047	69,2563	67,9868	66,6966	65,3861	50'
11'	70,4841	69,2353	67,9655	66,6749	65,3641	49'
12'	70,4634	69,2143	67,9441	66,6532	65,3421	48'
13'	70,4428	69,1933	67,9228	66,6316	65,3200	47'
14'	70,4221	69,1723	67,9014	66,6099	65,2980	46'
15'	70,4015	69,1513	67,8801	66,5882	65,2760	45'
16'	70,3808	69,1303	67,8587	66,5665	65,2539	44'
17'	70,3601	69,1093	67,8373	66,5448	65,2319	43'
18'	70,3395	69,0882	67,8160	66,5230	65,2098	42'
19'	70,3188	69,0672	67,7946	66,5013	65,1878	41'
20'	70,2981	69,0462	67,7732	66,4796	65,1657	40'
21'	70,2774	69,0251	67,7518	66,4579	65,1437	39'
22'	70,2567	69,0041	67,7304	66,4361	65,1216	38'
23'	70,2360	68,9830	67,7090	66,4144	65,0995	37'
24'	70,2153	68,9620	67,6876	66,3926	65,0774	36'
25'	70,1946	68,9409	67,6662	66,3709	65,0553	35'
26'	70,1739	68,9198	67,6448	66,3491	65,0332	34'
27'	70,1531	68,8987	67,6233	66,3273	65,0111	33'
28'	70,1324	68,8776	67,6019	66,3056	64,9890	32'
29'	70,1117	68,8566	67,5805	66,2838	64,9669	31'
30'	70,0909	68,8355	67,5590	66,2620	64,9448	30'
	89°	88°	87°	86°	85°	α_1

Dat.

Gepr.:

bez.:

K. JUNG**G. m. b. H.
Göppingen****Sinus-Winkelabdrehsapparat**
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	0°	1°	2°	3°	4°	
30'	70,0909	68,8355	67,5590	66,2620	64,9448	30'
31'	70,0702	68,8144	67,5376	66,2402	64,9227	29'
32'	70,0494	68,7932	67,5161	66,2184	64,9006	28'
33'	70,0287	68,7721	67,4947	66,1966	64,8784	27'
34'	70,0079	68,7510	67,4732	66,1748	64,8563	26'
35'	69,9871	68,7299	67,4517	66,1530	64,8341	25'
36'	69,9663	68,7088	67,4302	66,1312	64,8120	24'
37'	69,9455	68,6876	67,4088	66,1094	64,7898	23'
38'	69,9248	68,6665	67,3873	66,0875	64,7677	22'
39'	69,9040	68,6453	67,3658	66,0657	64,7455	21'
40'	69,8832	68,6242	67,3443	66,0439	64,7233	20'
41'	69,8623	68,6030	67,3228	66,0220	64,7012	19'
42'	69,8415	68,5818	67,3013	66,0002	64,6790	18'
43'	69,8207	68,5607	67,2797	65,9783	64,6568	17'
44'	69,7999	68,5395	67,2582	65,9564	64,6346	16'
45'	69,7790	68,5183	67,2367	65,9346	64,6124	15'
46'	69,7582	68,4971	67,2151	65,9127	64,5902	14'
47'	69,7374	68,4759	67,1936	65,8908	64,5680	13'
48'	69,7165	68,4547	67,1721	65,8689	64,5458	12'
49'	69,6957	68,4335	67,1505	65,8471	64,5235	11'
50'	69,6748	68,4123	67,1289	65,8252	64,5013	10'
51'	69,6539	68,3911	67,1074	65,8033	64,4791	9'
52'	69,6330	68,3698	67,0858	65,7814	64,4569	8'
53'	69,6122	68,3486	67,0642	65,7594	64,4346	7'
54'	69,5913	68,3274	67,0427	65,7375	64,4124	6'
55'	69,5704	68,3061	67,0211	65,7156	64,3901	5'
56'	69,5495	68,2849	66,9995	65,6937	64,3679	4'
57'	69,5286	68,2636	66,9779	65,6717	64,3456	3'
58'	69,5077	68,2424	66,9563	65,6498	64,3233	2'
59'	69,4868	68,2211	66,9347	65,6279	64,3010	1'
60'	69,4658	68,1998	66,9131	65,6059	64,2788	0'
	89°	88°	87°	86°	85°	α

Dat.

Gepr.:

Gez.:

K. JUNG G. m. b. H. Göppingen		Sinus-Winkelabdrehsapparat Winkeleinstellung durch Endmasse				WA 45
Endmasshöhe h						
α	5°	6°	7°	8°	9°	
0'	64,2788	62,9320	61,5661	60,1815	58,7785	60'
1'	64,2565	62,9094	61,5432	60,1583	58,7550	59'
2'	64,2342	62,8868	61,5203	60,1350	58,7314	58'
3'	64,2119	62,8642	61,4974	60,1118	58,7079	57'
4'	64,1896	62,8416	61,4744	60,0885	58,6844	56'
5'	64,1673	62,8189	61,4515	60,0653	58,6608	55'
6'	64,1450	62,7963	61,4285	60,0420	58,6372	54'
7'	64,1226	62,7737	61,4056	60,0188	58,6137	53'
8'	64,1003	62,7510	61,3826	59,9955	58,5901	52'
9'	64,0780	62,7284	61,3596	59,9722	58,5665	51'
10'	64,0557	62,7057	61,3367	59,9489	58,5429	50'
11'	64,0333	62,6830	61,3137	59,9256	58,5194	49'
12'	64,0110	62,6604	61,2907	59,9024	58,4958	48'
13'	63,9886	62,6377	61,2677	59,8791	58,4722	47'
14'	63,9663	62,6150	61,2447	59,8558	58,4486	46'
15'	63,9439	62,5923	61,2217	59,8325	58,4250	45'
16'	63,9215	62,5697	61,1987	59,8091	58,4014	44'
17'	63,8992	62,5470	61,1757	59,7858	58,3777	43'
18'	63,8768	62,5243	61,1527	59,7625	58,3541	42'
19'	63,8544	62,5016	61,1297	59,7392	58,3305	41'
20'	63,8320	62,4789	61,1067	59,7159	58,3069	40'
21'	63,8096	62,4561	61,0836	59,6925	58,2832	39'
22'	63,7872	62,4334	61,0606	59,6692	58,2596	38'
23'	63,7648	62,4107	61,0376	59,6458	58,2359	37'
24'	63,7424	62,3880	61,0145	59,6225	58,2123	36'
25'	63,7200	62,3652	60,9915	59,5991	58,1886	35'
26'	63,6976	62,3425	60,9684	59,5758	58,1650	34'
27'	63,6751	62,3197	60,9454	59,5524	58,1413	33'
28'	63,6527	62,2970	60,9223	59,5290	58,1176	32'
29'	63,6303	62,2742	60,8992	59,5057	58,0940	31'
30'	63,6078	62,2515	60,8761	59,4823	58,0703	30'
	84°	83°	82°	81°	80°	α_1

Dat.

Gepr.:

Gez.:

K. JUNG**G. m. b. H.****Göppingen**

Sinus-Winkelabdrehsapparat

WA 45

Winkeleinstellung durch Endmasse

Endmasshöhe h

α	5°	6°	7°	8°	9°	
30'	63,6078	62,2515	60,8761	59,4823	58,0703	30'
31'	63,5854	62,2287	60,8531	59,4589	58,0466	29'
32'	63,5629	62,2059	60,8300	59,4355	58,0229	28'
33'	63,5405	62,1831	60,8069	59,4121	57,9992	27'
34'	63,5180	62,1604	60,7838	59,3887	57,9755	26'
35'	63,4955	62,1376	60,7607	59,3653	57,9518	25'
36'	63,4731	62,1148	60,7376	59,3419	57,9281	24'
37'	63,4506	62,0920	60,7145	59,3185	57,9044	23'
38'	63,4281	62,0692	60,6914	59,2951	57,8807	22'
39'	63,4056	62,0464	60,6682	59,2716	57,8570	21'
40'	63,3831	62,0235	60,6451	59,2482	57,8332	20'
41'	63,3606	62,0007	60,6220	59,2248	57,8095	19'
42'	63,3381	61,9779	60,5988	59,2013	57,7858	18'
43'	63,3156	61,9551	60,5757	59,1779	57,7620	17'
44'	63,2931	61,9322	60,5526	59,1544	57,7383	16'
45'	63,2705	61,9094	60,5294	59,1310	57,7145	15'
46'	63,2480	61,8865	60,5062	59,1075	57,6908	14'
47'	63,2255	61,8637	60,4831	59,0840	57,6670	13'
48'	63,2029	61,8408	60,4599	59,0606	57,6432	12'
49'	63,1804	61,8180	60,4367	59,0371	57,6195	11'
50'	63,1578	61,7951	60,4136	59,0136	57,5957	10'
51'	63,1353	61,7722	60,3904	58,9901	57,5719	9'
52'	63,1127	61,7494	60,3672	58,9666	57,5481	8'
53'	63,0902	61,7265	60,3440	58,9431	57,5243	7'
54'	63,0676	61,7036	60,3208	58,9196	57,5005	6'
55'	63,0450	61,6807	60,2976	58,8961	57,4767	5'
56'	63,0224	61,6578	60,2744	58,8726	57,4529	4'
57'	62,9998	61,6349	60,2512	58,8491	57,4291	3'
58'	62,9772	61,6120	60,2280	58,8256	57,4053	2'
59'	62,9546	61,5891	60,2047	58,8021	57,3815	1'
60'	62,9320	61,5661	60,1815	58,7785	57,3576	0'
	84°	83°	82°	81°	80°	α_1

Dat.

Gepr.:

Sez.:

Endmasshöhe h

α	10°	11°	12°	13°	14°	
0'	57,3576	55,9193	54,4639	52,9919	51,5038	60'
1'	57,3338	55,8952	54,4395	52,9673	51,4789	59'
2'	57,3100	55,8710	54,4151	52,9426	51,4539	58'
3'	57,2861	55,8469	54,3907	52,9179	51,4290	57'
4'	57,2623	55,8228	54,3663	52,8932	51,4040	56'
5'	57,2384	55,7987	54,3419	52,8685	51,3791	55'
6'	57,2146	55,7745	54,3174	52,8438	51,3541	54'
7'	57,1907	55,7504	54,2930	52,8191	51,3292	53'
8'	57,1669	55,7262	54,2686	52,7944	51,3042	52'
9'	57,1430	55,7021	54,2442	52,7697	51,2792	51'
10'	57,1191	55,6779	54,2197	52,7450	51,2543	50'
11'	57,0952	55,6537	54,1953	52,7203	51,2293	49'
12'	57,0714	55,6296	54,1708	52,6956	51,2043	48'
13'	57,0475	55,6054	54,1464	52,6709	51,1793	47'
14'	57,0236	55,5812	54,1219	52,6461	51,1543	46'
15'	56,9997	55,5570	54,0974	52,6214	51,1293	45'
16'	56,9758	55,5328	54,0730	52,5967	51,1043	44'
17'	56,9519	55,5086	54,0485	52,5719	51,0793	43'
18'	56,9280	55,4844	54,0240	52,5472	51,0543	42'
19'	56,9040	55,4602	53,9996	52,5224	51,0293	41'
20'	56,8801	55,4360	53,9751	52,4977	51,0043	40'
21'	56,8562	55,4118	53,9506	52,4729	50,9792	39'
22'	56,8323	55,3876	53,9261	52,4481	50,9542	38'
23'	56,8083	55,3634	53,9016	52,4234	50,9292	37'
24'	56,7844	55,3392	53,8771	52,3986	50,9041	36'
25'	56,7604	55,3149	53,8526	52,3738	50,8791	35'
26'	56,7365	55,2907	53,8281	52,3490	50,8541	34'
27'	56,7125	55,2664	53,8035	52,3242	50,8290	33'
28'	56,6886	55,2422	53,7790	52,2995	50,8040	32'
29'	56,6646	55,2180	53,7545	52,2747	50,7789	31'
30'	56,6406	55,1937	53,7300	52,2499	50,7538	30'
	79°	78°	77°	76°	75°	α_1

K. JUNG

G. m. b. H.

Göppingen

Sinus-Winkelabdrehsapparat

Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	10°	11°	12°	13°	14°	
30'	56,6406	55,1937	53,7300	52,2499	50,7538	30'
31'	56,6166	55,1694	53,7054	52,2251	50,7288	29'
32'	56,5927	55,1452	53,6809	52,2002	50,7037	28'
33'	56,5687	55,1209	53,6563	52,1754	50,6786	27'
34'	56,5447	55,0966	53,6318	52,1506	50,6535	26'
35'	56,5207	55,0724	53,6072	52,1258	50,6285	25'
36'	56,4967	55,0481	53,5827	52,1010	50,6034	24'
37'	56,4727	55,0238	53,5581	52,0761	50,5783	23'
38'	56,4487	54,9995	53,5335	52,0513	50,5532	22'
39'	56,4247	54,9752	53,5090	52,0265	50,5281	21'
40'	56,4007	54,9509	53,4844	52,0016	50,5030	20'
41'	56,3766	54,9266	53,4598	51,9768	50,4779	19'
42'	56,3526	54,9023	53,4352	51,9519	50,4528	18'
43'	56,3286	54,8780	53,4106	51,9271	50,4276	17'
44'	56,3045	54,8536	53,3861	51,9022	50,4025	16'
45'	56,2805	54,8293	53,3615	51,8773	50,3774	15'
46'	56,2564	54,8050	53,3368	51,8525	50,3523	14'
47'	56,2324	54,7807	53,3122	51,8276	50,3271	13'
48'	56,2083	54,7563	53,2876	51,8027	50,3020	12'
49'	56,1843	54,7320	53,2630	51,7778	50,2769	11'
50'	56,1602	54,7076	53,2384	51,7529	50,2517	10'
51'	56,1361	54,6833	53,2138	51,7280	50,2266	9'
52'	56,1121	54,6589	53,1891	51,7031	50,2014	8'
53'	56,0880	54,6346	53,1645	51,6782	50,1762	7'
54'	56,0639	54,6102	53,1399	51,6533	50,1511	6'
55'	56,0398	54,5858	53,1152	51,6284	50,1259	5'
56'	56,0157	54,5615	53,0906	51,6035	50,1007	4'
57'	55,9916	54,5371	53,0659	51,5786	50,0756	3'
58'	55,9675	54,5127	53,0413	51,5537	50,0504	2'
59'	55,9434	54,4883	53,0166	51,5287	50,0252	1'
60'	55,9193	54,4639	52,9919	51,5038	50,0000	0'
	79°	78°	77°	76°	75°	α_1

Dat.

Gepr.:

bez.:

K. JUNG**G. m. b. H.****Göppingen**

Sinus-Winkelabdrehabparat

Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	15°	16°	17°	18°	19°	
0'	50.000	48,4810	46,9472	45,3990	43,8371	60'
1'	49,9748	48,4555	46,9215	45,3731	43,8110	59'
2'	49,9496	48,4301	46,8958	45,3472	43,7848	58'
3'	49,9244	48,4046	46,8701	45,3213	43,7587	57'
4'	49,8992	48,3792	46,8444	45,2953	43,7325	56'
5'	49,8740	48,3537	46,8187	45,2694	43,7063	55'
6'	49,8488	48,3282	46,7930	45,2435	43,6802	54'
7'	49,8236	48,3028	46,7673	45,2175	43,6540	53'
8'	49,7983	48,2773	46,7416	45,1916	43,6278	52'
9'	49,7731	48,2518	46,7158	45,1656	43,6017	51'
10'	49,7479	48,2263	46,6901	45,1397	43,5755	50'
11'	49,7226	48,2009	46,6644	45,1137	43,5493	49'
12'	49,6974	48,1754	46,6387	45,0878	43,5231	48'
13'	49,6722	48,1499	46,6129	45,0618	43,4969	47'
14'	49,6469	48,1244	46,5872	45,0358	43,4707	46'
15'	49,6217	48,0989	46,5615	45,0098	43,4445	45'
16'	49,5964	48,0734	46,5357	44,9839	43,4183	44'
17'	49,5711	48,0479	46,5100	44,9579	43,3921	43'
18'	49,5459	48,0223	46,4842	44,9319	43,3659	42'
19'	49,5206	47,9968	46,4584	44,9059	43,3397	41'
20'	49,4953	47,9713	46,4327	44,8799	43,3135	40'
21'	49,4700	47,9458	46,4069	44,8539	43,2873	39'
22'	49,4448	47,9203	46,3812	44,8279	43,2610	38'
23'	49,4195	47,8947	46,3554	44,8019	43,2348	37'
24'	49,3942	47,8692	46,3296	44,7759	43,2086	36'
25'	49,3689	47,8436	46,3038	44,7499	43,1823	35'
26'	49,3436	47,8181	46,2780	44,7239	43,1561	34'
27'	49,3183	47,7925	46,2523	44,6979	43,1299	33'
28'	49,2930	47,7670	46,2265	44,6718	43,1036	32'
29'	49,2677	47,7414	46,2007	44,6458	43,0774	31'
30'	49,2424	47,7159	46,1749	44,6198	43,0511	30'
	74°	73°	72°	71°	70°	α_1

Dat.

Gepr.:

Gez.:

K. JUNG
G. m. b. H.
Göppingen

Sinus-Winkelabdrehabparat
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	15°	16°	17°	18°	19°	
30'	49,2424	47,7159	46,1749	44,6198	43,0511	30'
31'	49,2170	47,6903	46,1491	44,5937	43,0249	29'
32'	49,1917	47,6647	46,1232	44,5677	42,9986	28'
33'	49,1664	47,6392	46,0974	44,5417	42,9723	27'
34'	49,1411	47,6136	46,0716	44,5156	42,9461	26'
35'	49,1157	47,5880	46,0458	44,4896	42,9198	25'
36'	49,0904	47,5624	46,0200	44,4635	42,8935	24'
37'	49,0650	47,5368	45,9942	44,4375	42,8672	23'
38'	49,0397	47,5112	45,9683	44,4114	42,8410	22'
39'	49,0143	47,4856	45,9425	44,3853	42,8147	21'
40'	48,9890	47,4600	45,9166	44,3593	42,7884	20'
41'	48,9636	47,4344	45,8908	44,3332	42,7621	19'
42'	48,9382	47,4088	45,8650	44,3071	42,7358	18'
43'	48,9129	47,3832	45,8391	44,2810	42,7095	17'
44'	48,8875	47,3576	45,8133	44,2550	42,6832	16'
45'	48,8621	47,3320	45,7874	44,2288	42,6569	15'
46'	48,8367	47,3063	45,7615	44,2028	42,6306	14'
47'	48,8114	47,2807	45,7357	44,1767	42,6042	13'
48'	48,7860	47,2551	45,7098	44,1506	42,5779	12'
49'	48,7606	47,2294	45,6839	44,1245	42,5516	11'
50'	48,7352	47,2038	45,6580	44,0984	42,5253	10'
51'	48,7098	47,1782	45,6322	44,0723	42,4990	9'
52'	48,6844	47,1525	45,6063	44,0462	42,4726	8'
53'	48,6590	47,1268	45,5804	44,0200	42,4463	7'
54'	48,6335	47,1012	45,5545	43,9939	42,4199	6'
55'	48,6081	47,0755	45,5286	43,9678	42,3936	5'
56'	48,5827	47,0499	45,5027	43,9417	42,3673	4'
57'	48,5573	47,0242	45,4768	43,9155	42,3409	3'
58'	48,5318	46,9985	45,4509	43,8894	42,3145	2'
59'	48,5064	46,9728	45,4250	43,8633	42,2882	1'
60'	48,4810	46,9472	45,3990	43,8371	42,2618	0'
	74°	73°	72°	71°	70°	α_1

Dat.

Gepr.:

Sez.:

K. JUNG**G. m. b. H.
Göppingen****Sinus-Winkelabdrehsapparat
Winkeleinstellung durch Endmasse****WA 45****Endmasshöhe h**

α	20°	21°	22°	23°	24°	
0'	42,2618	40,6737	39,0731	37,4607	35,8368	60'
1'	42,2355	40,6471	39,0463	37,4337	35,8096	59'
2'	42,2091	40,6205	39,0196	37,4067	35,7825	58'
3'	42,1827	40,5939	38,9928	37,3797	35,7553	57'
4'	42,1563	40,5673	38,9660	37,3528	35,7281	56'
5'	42,1300	40,5408	38,9392	37,3258	35,7010	55'
6'	42,1036	40,5142	38,9124	37,2988	35,6738	54'
7'	42,0772	40,4876	38,8856	37,2718	35,6466	53'
8'	42,0508	40,4610	38,8588	37,2448	35,6194	52'
9'	42,0244	40,4344	38,8320	37,2178	35,5923	51'
10'	41,9980	40,4078	38,8052	37,1908	35,5651	50'
11'	41,9716	40,3811	38,7784	37,1638	35,5379	49'
12'	41,9452	40,3545	38,7516	37,1368	35,5107	48'
13'	41,9188	40,3279	38,7247	37,1098	35,4835	47'
14'	41,8924	40,3013	38,6979	37,0828	35,4563	46'
15'	41,8660	40,2747	38,6711	37,0557	35,4291	45'
16'	41,8396	40,2480	38,6443	37,0287	35,4019	44'
17'	41,8131	40,2214	38,6174	37,0017	35,3747	43'
18'	41,7867	40,1948	38,5906	36,9747	35,3475	42'
19'	41,7603	40,1681	38,5638	36,9476	35,3203	41'
20'	41,7338	40,1415	38,5369	36,9206	35,2931	40'
21'	41,7074	40,1149	38,5101	36,8937	35,2658	39'
22'	41,6810	40,0882	38,4832	36,8665	35,2386	38'
23'	41,6545	40,0616	38,4564	36,8395	35,2114	37'
24'	41,6281	40,0349	38,4295	36,8125	35,1842	36'
25'	41,6016	40,0082	38,4027	36,7854	35,1568	35'
26'	41,5752	39,9816	38,3758	36,7584	35,1297	34'
27'	41,5487	39,9549	38,3490	36,7313	35,1025	33'
28'	41,5223	39,9283	38,3221	36,7042	35,0752	32'
29'	41,4958	39,9016	38,2952	36,6772	35,0480	31'
30'	41,4693	39,8749	38,2683	36,6501	35,0207	30'
	69°	68°	67°	66°	65°	α_1

Dat.

Gepr.:

Gez.:

Endmasshöhe h

α	20°	21°	22°	23°	24°	
30'	41,4693	39,8749	38,2683	36,6501	35,0207	30'
31'	41,4429	39,8482	38,2415	36,6231	34,9935	29'
32'	41,4164	39,8215	38,2146	36,5960	34,9662	28'
33'	41,3899	39,7949	38,1877	36,5689	34,9390	27'
34'	41,3634	39,7682	38,1608	36,5418	34,9117	26'
35'	41,3369	39,7415	38,1339	36,5148	34,8845	25'
36'	41,3104	39,7148	38,1070	36,4877	34,8572	24'
37'	41,2840	39,6881	38,0801	36,4606	34,8299	23'
38'	41,2575	39,6614	38,0532	36,4335	34,8027	22'
39'	41,2310	39,6347	38,0263	36,4064	34,7754	21'
40'	41,2045	39,6080	37,9994	36,3793	34,7481	20'
41'	41,1779	39,5813	37,9725	36,3522	34,7208	19'
42'	41,1514	39,5546	37,9456	36,3251	34,6936	18'
43'	41,1249	39,5278	37,9187	36,2980	34,6663	17'
44'	41,0984	39,5011	37,8918	36,2709	34,6390	16'
45'	41,0719	39,4744	37,8649	36,2438	34,6117	15'
46'	41,0454	39,4477	37,8379	36,2167	34,5844	14'
47'	41,0188	39,4209	37,8110	36,1896	34,5571	13'
48'	40,9923	39,3942	37,7841	36,1625	34,5298	12'
49'	40,96581	39,3675	37,7571	36,1353	34,5025	11'
50'	40,9392	39,3407	37,7302	36,1082	34,4752	10'
51'	40,9127	39,3140	37,7033	36,0811	34,4479	9'
52'	40,8861	39,2872	37,6763	36,0540	34,4206	8'
53'	40,8596	39,2605	37,6494	36,0268	34,3933	7'
54'	40,8330	39,2337	37,6224	35,9997	34,3660	6'
55'	40,8065	39,2070	37,5955	35,9725	34,3387	5'
56'	40,7799	39,1802	37,5685	35,9454	34,3113	4'
57'	40,7534	39,1534	37,5416	35,9183	34,2840	3'
58'	40,7268	39,1267	37,5146	35,8911	34,2567	2'
59'	40,7002	39,0999	37,4876	35,8640	34,2293	1'
60'	40,6737	39,0731	37,4607	35,8368	34,2020	0'
	69°	68°	67°	66°	65°	α_1

Gez.:

Gepr.:

Dat.:

K. JUNG
G. m. b. H.
Göppingen

Sinus-Winkelabdrehsapparat
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	25°	26°	27°	28°	29°	
0'	34,2020	32,5568	30,9017	29,2372	27,5637	60'
1'	34,1747	32,5293	30,8740	29,2094	27,5358	59'
2'	34,1473	32,5018	30,8464	29,1815	27,5078	58'
3'	34,1200	32,4743	30,8187	29,1537	27,4798	57'
4'	34,0927	32,4468	30,7910	29,1259	27,4519	56'
5'	34,0653	32,4193	30,7633	29,0981	27,4239	55'
6'	34,0380	32,3917	30,7357	29,0702	27,3959	54'
7'	34,0106	32,3642	30,7080	29,0424	27,3679	53'
8'	33,9832	32,3367	30,6803	29,0145	27,3400	52'
9'	33,9559	32,3092	30,6526	28,9867	27,3120	51'
10'	33,9285	32,2816	30,6249	28,9589	27,2840	50'
11'	33,9012	32,2541	30,5972	28,9310	27,2560	49'
12'	33,8738	32,2266	30,5695	28,9032	27,2280	48'
13'	33,8464	32,1990	30,5418	28,8753	27,2000	47'
14'	33,8190	32,1715	30,5141	28,8475	27,1720	46'
15'	33,7917	32,1439	30,4864	28,8196	27,1440	45'
16'	33,7643	32,1164	30,4587	28,7918	27,1160	44'
17'	33,7369	32,0889	30,4310	28,7639	27,0880	43'
18'	33,7095	32,0613	30,4033	28,7361	27,0600	42'
19'	33,6821	32,0337	30,3756	28,7082	27,0320	41'
20'	33,6547	32,0062	30,3479	28,6803	27,0040	40'
21'	33,6274	31,9786	30,3202	28,6525	26,9760	39'
22'	33,6000	31,9511	30,2924	28,6246	26,9480	38'
23'	33,5726	31,9235	30,2647	28,5967	26,9200	37'
24'	33,5452	31,8959	30,2370	28,5688	26,8920	36'
25'	33,5178	31,8684	30,2093	28,5410	26,8640	35'
26'	33,4903	31,8408	30,1815	28,5131	26,8359	34'
27'	33,4629	31,8132	30,1538	28,4852	26,8079	33'
28'	33,4355	31,7856	30,1261	28,4573	26,7799	32'
29'	33,4081	31,7580	30,0983	28,4294	26,7519	31'
30'	33,3807	31,7305	30,0706	28,4015	26,7238	30'
	64°	63°	62°	61°	60°	α_1

Dat.

Gepr.:

Gez.:

K. JUNG**G. m. b. H.
Göppingen**Sinus-Winkelabdrehapparate
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	25°	26°	27°	28°	29°	
30'	33,3807	31,7305	30,0706	28,4015	26,7238	30'
31'	33,3533	31,7029	30,0428	28,3736	26,6958	29'
32'	33,3258	31,6753	30,0151	28,3457	26,6678	28'
33'	33,2984	31,6477	29,9873	28,3179	26,6397	27'
34'	33,2710	31,6201	29,9596	28,2900	26,6117	26'
35'	33,2435	31,5925	29,9318	28,2620	26,5837	25'
36'	33,2161	31,5649	29,9041	28,2341	26,5556	24'
37'	33,1887	31,5373	29,8763	28,2062	26,5276	23'
38'	33,1612	31,5097	29,8486	28,1783	26,4995	22'
39'	33,1338	31,4821	29,8208	28,1504	26,4715	21'
40'	33,1063	31,4545	29,7930	28,1225	26,4434	20'
41'	33,0789	31,4269	29,7653	28,0946	26,4154	19'
42'	33,0514	31,3992	29,7375	28,0667	26,3873	18'
43'	33,0240	31,3716	29,7097	28,0388	26,3592	17'
44'	32,9965	31,3440	29,6819	28,0108	26,3312	16'
45'	32,9691	31,3164	29,6542	27,9829	26,3031	15'
46'	32,9416	31,2888	29,6264	27,9550	26,2751	14'
47'	32,9141	31,2611	29,5986	27,9270	26,2470	13'
48'	32,8867	31,2335	29,5708	27,8991	26,2189	12'
49'	32,8592	31,2059	29,5430	27,8712	26,1908	11'
50'	32,8317	31,1782	29,5152	27,8432	26,1628	10'
51'	32,8042	31,1506	29,4874	27,8153	26,1347	9'
52'	32,7768	31,1229	29,4596	27,7874	26,1066	8'
53'	32,7493	31,0953	29,4318	27,7594	26,0785	7'
54'	32,7218	31,0676	29,4040	27,7315	26,0505	6'
55'	32,6943	31,0400	29,3762	27,7035	26,0224	5'
56'	32,6668	31,0123	29,3484	27,6756	25,9943	4'
57'	32,6393	30,9847	29,3206	27,6476	25,9662	3'
58'	32,6118	30,9570	29,2928	27,6197	25,9381	2'
59'	32,5843	30,9294	29,2650	27,5917	25,9100	1'
60'	32,5568	30,9017	29,2372	27,5637	25,8819	0'
	64°	63°	62°	61°	60°	α_1

Dat.

Gepr.:

bez.:

K. JUNG G. m. b. H. Göppingen		Sinus-Winkelabdrehsapparat Winkeleinstellung durch Endmasse				WA 45
Endmasshöhe h						
α	30°	31°	32°	33°	34°	
0'	25,8819	24,1922	22,4951	20,7912	19,0809	60'
1'	25,8538	24,1640	22,4668	20,7627	19,0523	59'
2'	25,8257	24,1357	22,4384	20,7343	19,0238	58'
3'	25,7976	24,1075	22,4101	20,7058	18,9952	57'
4'	25,7695	24,0793	22,3817	20,6773	18,9967	56'
5'	25,7414	24,0510	22,3534	20,6489	18,9381	55'
6'	25,7133	24,0228	22,3250	20,6204	18,9095	54'
7'	25,6852	23,9946	22,2967	20,5920	18,8810	53'
8'	25,6571	23,9663	22,2683	20,5635	18,8524	52'
9'	25,6289	23,9381	22,2399	20,5350	18,8238	51'
10'	25,6008	23,9098	22,2116	20,5065	18,7953	50'
11'	25,5727	23,8816	22,1832	20,4781	18,7667	49'
12'	25,5446	23,8533	22,1548	20,4496	18,7381	48'
13'	25,5165	23,8251	22,1265	20,4211	18,7096	47'
14'	25,4883	23,7968	22,0981	20,3927	18,6810	46'
15'	25,4602	23,7686	22,0697	20,3642	18,6524	45'
16'	25,4321	23,7403	22,0414	20,3357	18,6238	44'
17'	25,4039	23,7121	22,0130	20,3072	18,5952	43'
18'	25,3758	23,6838	21,9846	20,2787	18,5667	42'
19'	25,3477	23,6556	21,9562	20,2502	18,5381	41'
20'	25,3195	23,6273	21,9279	20,2218	18,5095	40'
21'	25,2914	23,5990	21,8995	20,1933	18,4809	39'
22'	25,2632	23,5708	21,8711	20,1648	18,4523	38'
23'	25,2351	23,5425	21,8427	20,1363	18,4237	37'
24'	25,2069	23,5142	21,8143	20,1078	18,3951	36'
25'	25,1788	23,4859	21,7859	20,0793	18,3665	35'
26'	25,1506	23,4577	21,7575	20,0508	18,3379	34'
27'	25,1225	23,4294	21,7292	20,0223	18,3094	33'
28'	25,0943	23,4011	21,7008	19,9938	18,2808	32'
29'	25,0662	23,3728	21,6724	19,9653	18,2522	31'
30'	25,0380	23,3445	21,6440	19,9368	18,2236	30'
	59°	58°	57°	56°	55°	α_1

Dat.

Gepr.:

ez.:

K. JUNG
G. m. b. H.
Göppingen

Sinus-Winkelabdrehsapparat
Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	30°	31°	32°	33°	34°	
30'	25,0380	23,3445	21,6440	19,9368	18,2236	30'
31'	25,0098	23,3163	21,6156	19,9083	18,1950	29'
32'	24,9817	23,2880	21,5872	19,8798	18,1663	28'
33'	24,9535	23,2597	21,5588	19,8513	18,1377	27'
34'	24,9253	23,2314	21,5303	19,8228	18,1091	26'
35'	24,8972	23,2031	21,5019	19,7942	18,0805	25'
36'	24,8690	23,1748	21,4735	19,7657	18,0519	24'
37'	24,8408	23,1465	21,4451	19,7372	18,0233	23'
38'	24,8126	23,1182	21,4167	19,7087	17,9947	22'
39'	24,7845	23,0899	21,3883	19,6802	17,9661	21'
40'	24,7563	23,0616	21,3599	19,6517	17,9375	20'
41'	24,7281	23,0333	21,3315	19,6231	17,9088	19'
42'	24,6999	23,0050	21,3030	19,5946	17,8802	18'
43'	24,6717	22,9767	21,2746	19,5661	17,8516	17'
44'	24,6435	22,9484	21,2462	19,5376	17,8230	16'
45'	24,6153	22,9200	21,2178	19,5090	17,7944	15'
46'	24,5871	22,8917	21,1893	19,4805	17,7657	14'
47'	24,5589	22,8634	21,1609	19,4520	17,7371	13'
48'	24,5307	22,8351	21,1325	19,4234	17,7085	12'
49'	24,5025	22,8068	21,1040	19,3949	17,6798	11'
50'	24,4743	22,7784	21,0756	19,3664	17,6512	10'
51'	24,4461	22,7501	21,0472	19,3378	17,6226	9'
52'	24,4179	22,7218	21,0187	19,3093	17,5939	8'
53'	24,3897	22,6935	20,9903	19,2807	17,5653	7'
54'	24,3615	22,6651	20,9619	19,2522	17,5367	6'
55'	24,3333	22,6368	20,9334	19,2237	17,5080	5'
56'	24,3051	22,6085	20,9050	19,1951	17,4794	4'
57'	24,2769	22,5801	20,8765	19,1666	17,4508	3'
58'	24,2486	22,5518	20,8481	19,1380	17,4221	2'
59'	24,2204	22,5234	20,8196	19,1095	17,3935	1'
60'	24,1922	22,4951	20,7912	19,0809	17,3648	0'
	59°	58°	57°	56°	55°	α_1

Dat.

Gepr.:

Gez.:

K. JUNG
G. m. b. H.
Göppingen

Sinus-Winkelabdrehsapparat
Winkелеinstellung durch Endmasse

WA 45

Endmasshöhe h

α	35°	36°	37°	38°	39°	
0'	17,3648	15,6434	13,9173	12,1869	10,4528	60'
1'	17,3362	15,6147	13,8885	12,1581	10,4239	59'
2'	17,3075	15,5860	13,8597	12,1292	10,3950	58'
3'	17,2789	15,5572	13,8300	12,1003	10,3661	57'
4'	17,2502	15,5285	13,8021	12,0714	10,3371	56'
5'	17,2216	15,4998	13,7733	12,0426	10,3082	55'
6'	17,1929	15,4710	13,7445	12,0137	10,2793	54'
7'	17,1643	15,4423	13,7156	11,9848	10,2503	53'
8'	17,1356	15,4136	13,6868	11,9559	10,2214	52'
9'	17,1069	15,3848	13,6580	11,9270	10,1924	51'
10'	17,0783	15,3561	13,6292	11,8982	10,1635	50'
11'	17,0496	15,3273	13,6004	11,8693	10,1346	49'
12'	17,0209	15,2986	13,5716	11,8404	10,1056	48'
13'	16,9923	15,2698	13,5427	11,8115	10,0767	47'
14'	16,9636	15,2411	13,5139	11,7826	10,0477	46'
15'	16,9350	15,2123	13,4851	11,7537	10,0188	45'
16'	16,9063	15,1836	13,4563	11,7249	9,9899	44'
17'	16,8776	15,1548	13,4274	11,6960	9,9609	43'
18'	16,8489	15,1261	13,3986	11,6671	9,9320	42'
19'	16,8203	15,0973	13,3698	11,6382	9,9030	41'
20'	16,7916	15,0686	13,3410	11,6093	9,8741	40'
21'	16,7629	15,0398	13,3121	11,5804	9,8451	39'
22'	16,7342	15,0111	13,2833	11,5515	9,8162	38'
23'	16,7056	14,9823	13,2545	11,5226	9,7872	37'
24'	16,6769	14,9535	13,2256	11,4937	9,7583	36'
25'	16,6482	14,9248	13,1968	11,4648	9,7293	35'
26'	16,6195	14,8960	13,1680	11,4359	9,7004	34'
27'	16,5908	14,8672	13,1391	11,4070	9,6714	33'
28'	16,5621	14,8385	13,1103	11,3781	9,6425	32'
29'	16,5334	14,8097	13,0815	11,3492	9,6135	31'
30'	16,5048	14,7809	13,0526	11,3203	9,5846	30'
	54°	53°	52°	51°	50°	α

Dat.

Gepr.:

Gez.:

Endmasshöhe h

α	35°	36°	37°	38°	39°	
30'	16,5048	14,7809	13,0526	11,3203	9,5846	30'
31'	16,4761	14,7522	13,0238	11,2914	9,5556	29'
32'	16,4474	14,7234	12,9949	11,2625	9,5267	28'
33'	16,4187	14,6946	12,9661	11,2336	9,4977	27'
34'	16,3900	14,6659	12,9373	11,2047	9,4687	26'
35'	16,3613	14,6371	12,9084	11,1758	9,4398	25'
36'	16,3326	14,6083	12,8796	11,1469	9,4108	24'
37'	16,3039	14,5795	12,8507	11,1180	9,3819	23'
38'	16,2752	14,5507	12,8219	11,0891	9,3529	22'
39'	16,2465	14,5220	12,7930	11,0602	9,3239	21'
40'	16,2178	14,4932	12,7642	11,0313	9,2950	20'
41'	16,1891	14,4644	12,7353	11,0023	9,2660	19'
42'	16,1604	14,4356	12,7067	10,9734	9,2371	18'
43'	16,1317	14,4068	12,6776	10,9445	9,2081	17'
44'	16,1030	14,3780	12,6488	10,9156	9,1791	16'
45'	16,0743	14,3493	12,6199	10,8867	9,1502	15'
46'	16,0455	14,3205	12,5910	10,8578	9,1212	14'
47'	16,0168	14,2917	12,5622	10,8289	9,0922	13'
48'	15,9881	14,2629	12,5333	10,7999	9,0633	12'
49'	15,9594	14,2341	12,5045	10,7710	9,0343	11'
50'	15,9307	14,2053	12,4756	10,7421	9,0053	10'
51'	15,9020	14,1765	12,4467	10,7132	8,9763	9'
52'	15,8732	14,1477	12,4179	10,6843	8,9474	8'
53'	15,8445	14,1189	12,3890	10,6553	8,9184	7'
54'	15,8158	14,0901	12,3601	10,6264	8,8894	6'
55'	15,7871	14,0613	12,3313	10,5975	8,8605	5'
56'	15,7584	14,0325	12,3024	10,5686	8,8325	4'
57'	15,7296	14,0037	12,2735	10,5396	8,8025	3'
58'	15,7009	13,9749	12,2447	10,5107	8,7735	2'
59'	15,6722	13,9461	12,2158	10,4818	8,7446	1'
60'	15,6434	13,9173	12,1869	10,4528	8,7156	0'
	54°	53°	52°	51°	50°	α_1

Dat.

Gepr.:

Gez.:

Endmasshöhe h

α	40°	41°	42°	43°	44°	
0'	8,7156	6,9756	5,2336	3,4899	1,7452	60'
1'	8,6866	6,9466	5,2045	3,4609	1,7162	59'
2'	8,6576	6,9176	5,1755	3,4318	1,6871	58'
3'	8,6286	6,8886	5,1464	3,4027	1,6580	57'
4'	8,5997	6,8596	5,1174	3,3737	1,6289	56'
5'	8,5707	6,8306	5,0883	3,3446	1,5998	55'
6'	8,5417	6,8015	5,0593	3,3155	1,5707	54'
7'	8,5127	6,7725	5,0302	3,2864	1,5416	53'
8'	8,4837	6,7435	5,0012	3,2574	1,5126	52'
9'	8,4547	6,7145	4,9721	3,2283	1,4835	51'
10'	8,4258	6,6854	4,9431	3,1992	1,4544	50'
11'	8,3968	6,6564	4,9140	3,1702	1,4253	49'
12'	8,3678	6,6274	4,8850	3,1411	1,3962	48'
13'	8,3388	6,5984	4,8559	3,1120	1,3671	47'
14'	8,3098	6,5693	4,8269	3,0829	1,3380	46'
15'	8,2808	6,5403	4,7978	3,0539	1,3090	45'
16'	8,2518	6,5113	4,7688	3,0248	1,2799	44'
17'	8,2228	6,4823	4,7397	2,9957	1,2508	43'
18'	8,1939	6,4532	4,7106	2,9666	1,2217	42'
19'	8,1649	6,4242	4,6816	2,9375	1,1926	41'
20'	8,1359	6,3952	4,6525	2,9085	1,1635	40'
21'	8,1069	6,3661	4,6235	2,8794	1,1344	39'
22'	8,0779	6,3371	4,5944	2,8503	1,1054	38'
23'	8,0489	6,3081	4,5654	2,8212	1,0763	37'
24'	8,0199	6,2791	4,5363	2,7922	1,0472	36'
25'	7,9909	6,2500	4,5072	2,7631	1,0181	35'
26'	7,9619	6,2210	4,4782	2,7340	0,9890	34'
27'	7,9329	6,1920	4,4491	2,7049	0,9599	33'
28'	7,9039	6,1629	4,4201	2,6759	0,9308	32'
29'	7,8749	6,1339	4,3910	2,6468	0,9017	31'
30'	7,8459	6,1049	4,3619	2,6177	0,8727	30'
	49°	48°	47°	46°	45°	α_1

Dat.

Gepr.:

bez.:

K. JUNG

G. m. b. H.

Göppingen

Sinus-Winkelabdrehsapparat

Winkeleinstellung durch Endmasse

WA 45

Endmasshöhe h

α	40°	41°	42°	43°	44°	
30'	7,8459	6,1049	4,3619	2,6177	0,8727	30'
31'	7,8169	6,0758	4,3329	2,5886	0,8436	29'
32'	7,7879	6,0468	4,3038	2,5595	0,8145	28'
33'	7,7589	6,0177	4,2748	2,5305	0,7854	27'
34'	7,7299	5,9887	4,2457	2,5014	0,7563	26'
35'	7,7009	5,9597	4,2166	2,4723	0,7272	25'
36'	7,6719	5,9306	4,1876	2,4432	0,6981	24'
37'	7,6429	5,9016	4,1585	2,4141	0,6690	23'
38'	7,6139	5,8726	4,1294	2,3851	0,6399	22'
39'	7,5849	5,8435	4,1004	2,3560	0,6109	21'
40'	7,5559	5,8145	4,0713	2,3269	0,5818	20'
41'	7,5269	5,7854	4,0422	2,2978	0,5527	19'
42'	7,4979	5,7564	4,0132	2,2687	0,5236	18'
43'	7,4689	5,7274	3,9841	2,2397	0,4945	17'
44'	7,4399	5,6983	3,9550	2,2106	0,4654	16'
45'	7,4108	5,6693	3,9260	2,1815	0,4363	15'
46'	7,3818	5,6402	3,8969	2,1524	0,4072	14'
47'	7,3528	5,6112	3,8678	2,1233	0,3782	13'
48'	7,3238	5,5822	3,8388	2,0942	0,3491	12'
49'	7,2948	5,5531	3,8097	2,0652	0,3200	11'
50'	7,2658	5,5241	3,7806	2,0361	0,2909	10'
51'	7,2368	5,4950	3,7516	2,0070	0,2618	9'
52'	7,2078	5,4660	3,7225	1,9779	0,2327	8'
53'	7,1788	5,4369	3,6934	1,9488	0,2036	7'
54'	7,1497	5,4079	3,6644	1,9197	0,1745	6'
55'	7,1207	5,3788	3,6353	1,8907	0,1454	5'
56'	7,0917	5,3498	3,6062	1,8616	0,1164	4'
57'	7,0627	5,3207	3,5772	1,8325	0,0873	3'
58'	7,0337	5,2917	3,5481	1,8034	0,0582	2'
59'	7,0047	5,2626	3,5190	1,7743	0,0291	1'
60'	6,9756	5,2336	3,4899	1,7452	0,0000	0'
	49°	48°	47°	46°	45°	α_1

Dat.

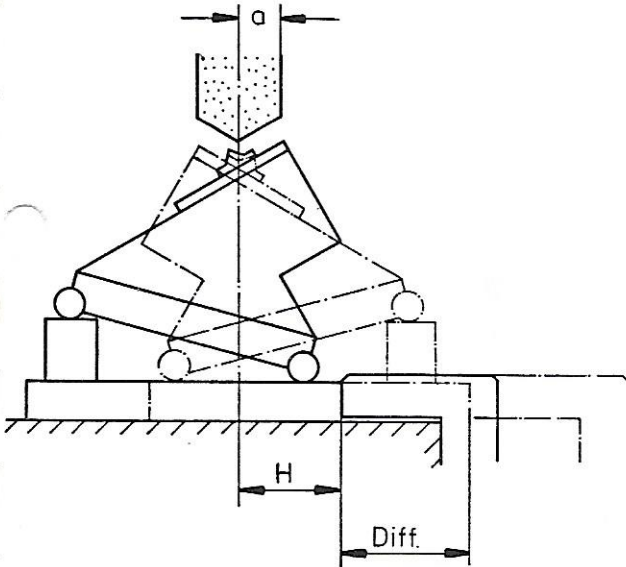
Gepr.:

Sez.:

Sinus-Winkel-Abrichtapparat WA 45

Zusatzblatt WA 45 / Z zur Druckschrift WA 45 - 72/3

Stumpfe und spitze symmetrische Winkel mit Bezugsmaß "a".



Stumpfe Winkel

Ein Hilfsmaß "H" wird durch Lotung von der Diamantspitze in der tiefsten Lage des Schiebers gefunden (gerades Maß). "H" z.B. 60 mm, das Differenzmaß wird errechnet:

$$\begin{aligned} \text{"Diff."} &= 2 \times \text{Hilfsmaß} - 140 \\ &= 120 - 140 \\ &= -20. \end{aligned}$$

Profiliervorgang

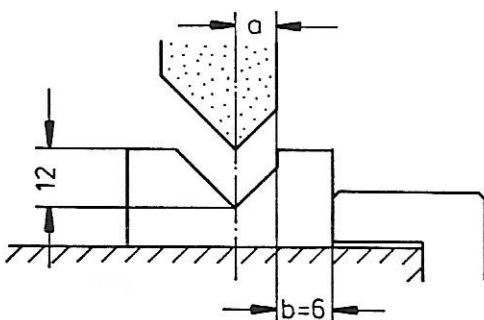
1. Nach Einstellung des gewünschten Winkels Hilfsmaß "H", z.B. 60 mm, ermitteln.
2. Antasten der Anschlagleiste mit der Stirnfläche der Schleifscheibe. In Quertisch-Positionieroptik das Ausgangsmaß "A", z.B. 180 mm, festlegen.
3. Einfahren des Quertisches auf die Profilierposition rechts "PR" und Profilieren.
4. Nach Umschlag des Sinus-Winkel-Abrichtapparates WA 45 Einfahren des Quertisches auf Profilierposition links "PL".
Profilieren ohne Höhenverstellung!

Profilierposition "PR"

$$\begin{aligned} \text{"PR"} &= A - (\text{Hilfsmaß} - a) \\ &= 180 - (60 - 10) \\ &= 130 \text{ mm.} \end{aligned}$$

Profilierposition "PL"

$$\begin{aligned} \text{"PL"} &= \text{"PR"} + \text{Differenzmaß} \\ &= 130 + (-20) \\ &= 110 \text{ mm.} \end{aligned}$$



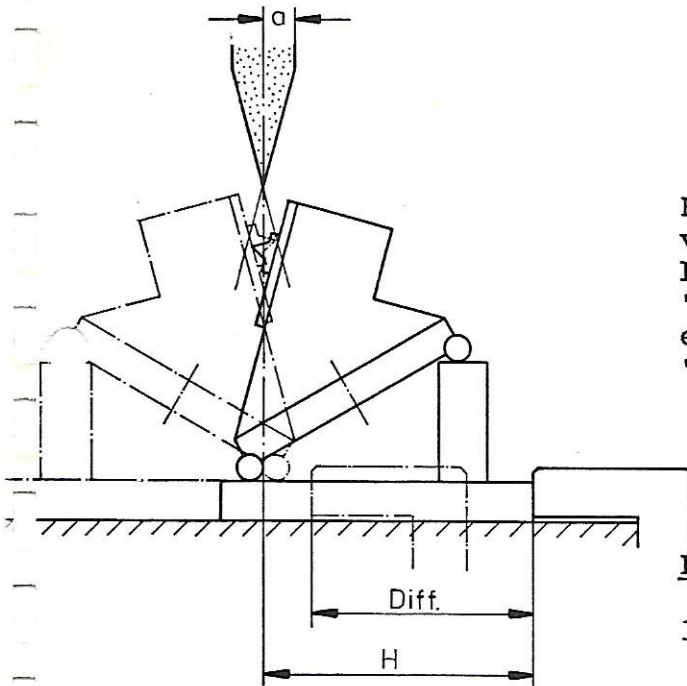
Schleifvorgang

5. Einfahren des Quertisches auf Schleifposition "PS".

$$\begin{aligned} \text{"PS"} &= A - b \\ &= 180 - 6 \\ &= 174 \text{ mm.} \end{aligned}$$

Sinus-Winkel-Abrichtapparat WA 45

Zusatzblatt WA 45 / Z zur Druckschrift WA 45 - 72/3



Ein Hilfsmaß "H" wird durch Lotung von der Diamantspitze in der tiefsten Lage des Schiebers gefunden (gerades Maß). "H" z.B. 60 mm, das Differenzmaß wird errechnet:

$$\begin{aligned} \text{"Diff."} &= 2 \times \text{Hilfsmaß} - 140 \\ &= 120 - 140 \\ &= 100 \text{ mm.} \end{aligned}$$

Profiliervorgang

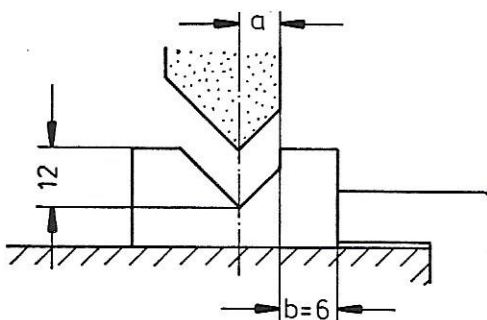
1. Nach Einstellung des gewünschten Winkels Hilfsmaß "H", z.B. 120 mm, ermitteln.
2. Antasten der Anschlagleiste mit der Stirnfläche der Schleifscheibe. In Quertisch-Positionieroptik das Ausgangsmaß "A", z.B. 180 mm, festlegen.
3. Einfahren des Quertisches auf die Profilierposition rechts "PR" und Profilieren.
4. Nach Umschlag des Sinus-Winkel-Abrichtapparates WA 45 Einfahren des Quertisches auf Profilierposition links "PL".
Profilieren ohne Höhenverstellung!

Profilierposition "PR"

$$\begin{aligned} \text{"PR"} &= A - (\text{Hilfsmaß} - a) \\ &= 180 - (60 - 10) \\ &= 70 \text{ mm.} \end{aligned}$$

Profilierposition "PL"

$$\begin{aligned} \text{"PL"} &= \text{"PR"} + \text{Differenzmaß} \\ &= 70 + 100 \\ &= 170 \text{ mm.} \end{aligned}$$



Schleifvorgang

5. Einfahren des Quertisches auf Schleifposition "PS".

$$\begin{aligned} \text{"PS"} &= A - b \\ &= 180 - 6 \\ &= 174 \text{ mm.} \end{aligned}$$