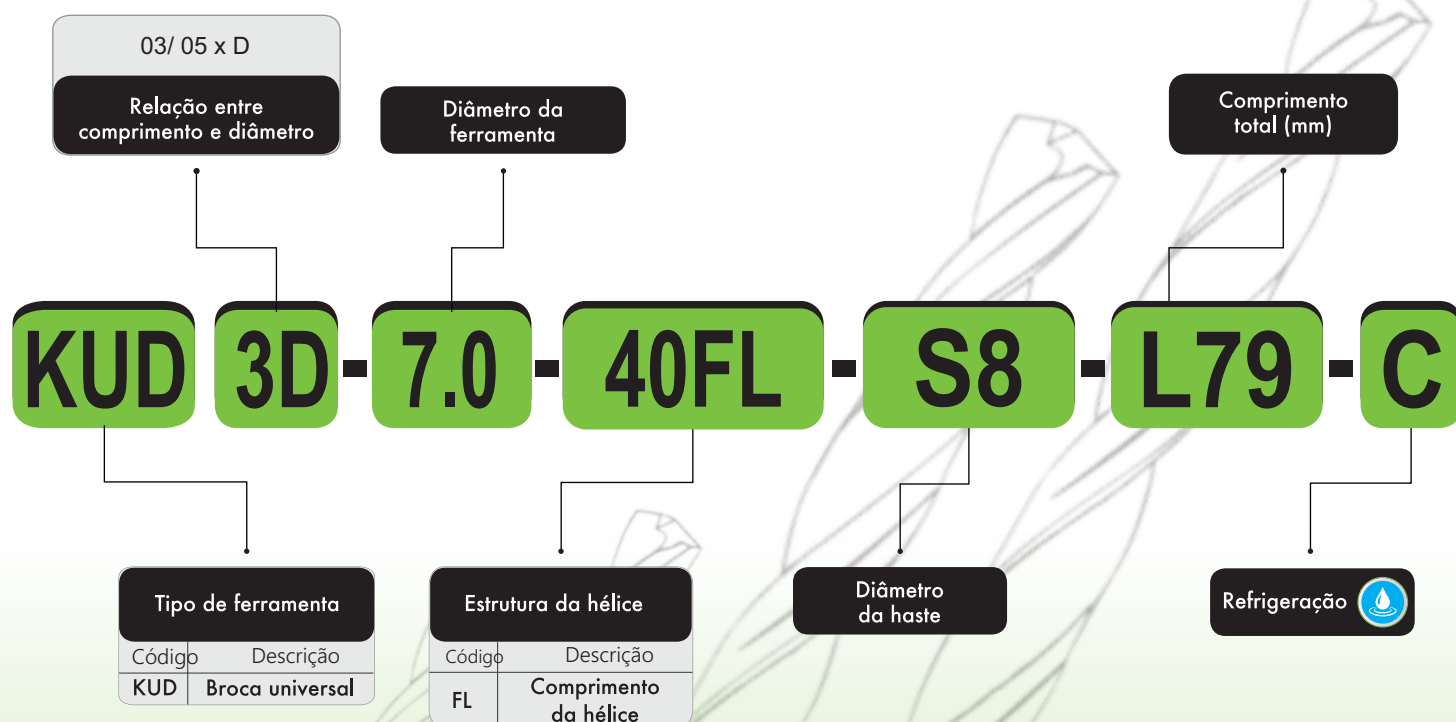
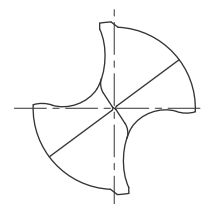
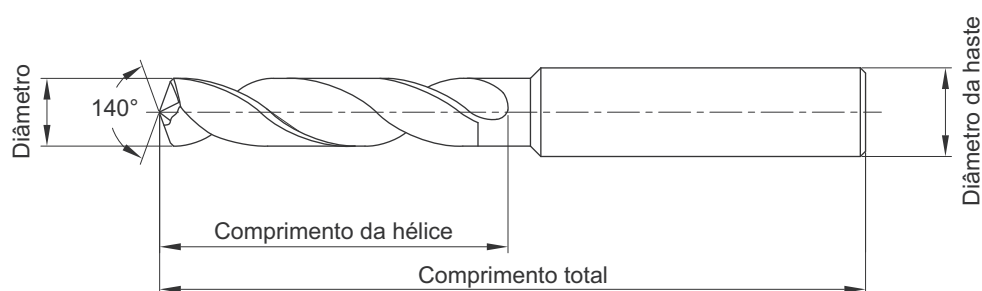


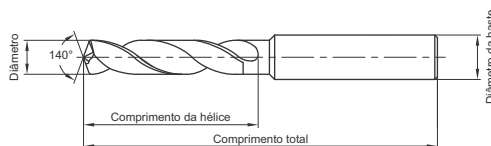


**Brocas
inteiriças de
Metal Duro**

Chave de código das brocas inteiriças de MD



KUD03

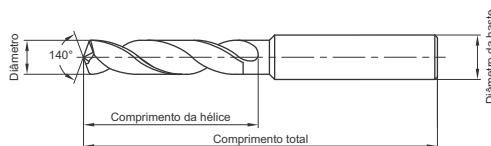


Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD3D-1.0-8FL-S3-L38	1,0	8	3	38
KUD3D-1.1-10FL-S3-L42	1,1	10	3	42
KUD3D-1.2-10FL-S3-L42	1,2	10	3	42
KUD3D-1.3-10FL-S3-L42	1,3	10	3	42
KUD3D-1.4-11FL-S3-L42	1,4	11	3	42
KUD3D-1.5-11FL-S3-L42	1,5	11	3	42
KUD3D-1.6-12FL-S3-L42	1,6	12	3	42
KUD3D-1.7-12FL-S3-L42	1,7	12	3	42
KUD3D-1.8-13FL-S3-L42	1,8	13	3	42
KUD3D-1.9-13FL-S3-L42	1,9	13	3	42
KUD3D-2.0-14FL-S3-L50	2,0	14	3	50
KUD3D-2.1-14FL-S3-L50	2,1	14	3	50
KUD3D-2.2-14FL-S3-L50	2,2	14	3	50
KUD3D-2.3-14FL-S3-L50	2,3	14	3	50
KUD3D-2.4-14FL-S3-L50	2,4	14	3	50
KUD3D-2.5-14FL-S3-L50	2,5	14	3	50
KUD3D-2.6-14FL-S3-L50	2,6	14	3	50
KUD3D-2.7-14FL-S3-L50	2,7	14	3	50
KUD3D-2.8-14FL-S3-L50	2,8	14	3	50
KUD3D-2.9-14FL-S3-L50	2,9	14	3	50
KUD3D-3.0-18FL-S3-L60	3,0	18	3	60
KUD3D-3.1-20FL-S4-L60	3,1	20	4	60
KUD3D-3.2-20FL-S4-L60	3,2	20	4	60
KUD3D-3.3-20FL-S4-L60	3,3	20	4	60
KUD3D-3.4-22FL-S4-L60	3,4	22	4	60
KUD3D-3.5-22FL-S4-L60	3,5	22	4	60
KUD3D-3.6-22FL-S4-L60	3,6	22	4	60
KUD3D-3.7-22FL-S4-L60	3,7	22	4	60
KUD3D-3.8-24FL-S4-L60	3,8	24	4	60
KUD3D-3.9-24FL-S4-L60	3,9	24	4	60
KUD3D-4.0-24FL-S4-L60	4,0	24	4	60
KUD3D-4.1-24FL-S5-L62	4,1	24	5	62
KUD3D-4.2-24FL-S5-L62	4,2	24	5	62
KUD3D-4.3-24FL-S5-L62	4,3	24	5	62
KUD3D-4.4-24FL-S5-L62	4,4	24	5	62
KUD3D-4.5-24FL-S5-L62	4,5	24	5	62
KUD3D-4.6-24FL-S5-L62	4,6	24	5	62
KUD3D-4.7-24FL-S5-L62	4,7	24	5	62
KUD3D-4.8-26FL-S5-L62	4,8	26	5	62
KUD3D-4.9-26FL-S5-L62	4,9	26	5	62
KUD3D-5.0-26FL-S5-L62	5,0	26	5	62

KUD03

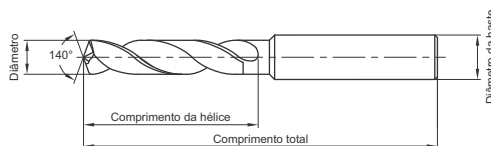


Cobertura

ALTiN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD3D-5.1-28FL-S6-L66	5,1	28	6	66
KUD3D-5.2-28FL-S6-L66	5,2	28	6	66
KUD3D-5.3-28FL-S6-L66	5,3	28	6	66
KUD3D-5.4-28FL-S6-L66	5,4	28	6	66
KUD3D-5.5-28FL-S6-L66	5,5	28	6	66
KUD3D-5.6-30FL-S6-L66	5,6	30	6	66
KUD3D-5.7-30FL-S6-L66	5,7	30	6	66
KUD3D-5.8-30FL-S6-L66	5,8	30	6	66
KUD3D-5.9-30FL-S6-L66	5,9	30	6	66
KUD3D-6.0-30FL-S6-L66	6,0	30	6	66
KUD3D-6.1-34FL-S7-L74	6,1	34	7	74
KUD3D-6.2-34FL-S7-L74	6,2	34	7	74
KUD3D-6.3-34FL-S7-L74	6,3	34	7	74
KUD3D-6.4-34FL-S7-L74	6,4	34	7	74
KUD3D-6.5-34FL-S7-L74	6,5	34	7	74
KUD3D-6.6-34FL-S7-L74	6,6	34	7	74
KUD3D-6.7-37FL-S7-L74	6,7	37	7	74
KUD3D-6.8-37FL-S7-L74	6,8	37	7	74
KUD3D-6.9-37FL-S7-L74	6,9	37	7	74
KUD3D-7.0-37FL-S7-L74	7,0	37	7	74
KUD3D-7.1-40FL-S8-L79	7,1	40	8	79
KUD3D-7.2-40FL-S8-L79	7,2	40	8	79
KUD3D-7.3-40FL-S8-L79	7,3	40	8	79
KUD3D-7.4-40FL-S8-L79	7,4	40	8	79
KUD3D-7.5-40FL-S8-L79	7,5	40	8	79
KUD3D-7.6-40FL-S8-L79	7,6	40	8	79
KUD3D-7.7-40FL-S8-L79	7,7	40	8	79
KUD3D-7.8-40FL-S8-L79	7,8	40	8	79
KUD3D-7.9-40FL-S8-L79	7,9	40	8	79
KUD3D-8.0-40FL-S8-L79	8,0	40	8	79
KUD3D-8.1-43FL-S9-L84	8,1	43	9	84
KUD3D-8.2-43FL-S9-L84	8,2	43	9	84
KUD3D-8.3-43FL-S9-L84	8,3	43	9	84
KUD3D-8.4-43FL-S9-L84	8,4	43	9	84
KUD3D-8.5-43FL-S9-L84	8,5	43	9	84
KUD3D-8.6-43FL-S9-L84	8,6	43	9	84
KUD3D-8.7-43FL-S9-L84	8,7	43	9	84
KUD3D-8.8-43FL-S9-L84	8,8	43	9	84
KUD3D-8.9-43FL-S9-L84	8,9	43	9	84
KUD3D-9.0-43FL-S9-L84	9,0	43	9	84

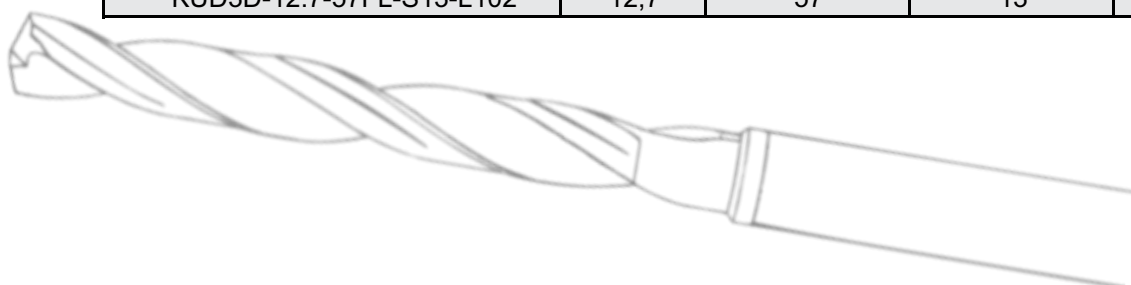
KUD03



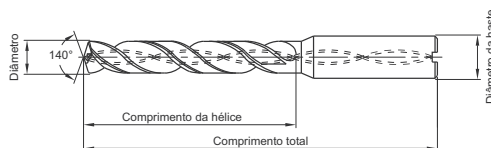
Cobertura

ALTiN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD3D-9.1-47FL-S10-L89	9,1	47	10	89
KUD3D-9.2-47FL-S10-L89	9,2	47	10	89
KUD3D-9.3-47FL-S10-L89	9,3	47	10	89
KUD3D-9.4-47FL-S10-L89	9,4	47	10	89
KUD3D-9.5-47FL-S10-L89	9,5	47	10	89
KUD3D-9.6-47FL-S10-L89	9,6	47	10	89
KUD3D-9.7-47FL-S10-L89	9,7	47	10	89
KUD3D-9.8-47FL-S10-L89	9,8	47	10	89
KUD3D-9.9-47FL-S10-L89	9,9	47	10	89
KUD3D-10.0-47FL-S10-L89	10,0	47	10	89
KUD3D-10.1-51FL-S11-L95	10,1	51	11	95
KUD3D-10.2-51FL-S11-L95	10,2	51	11	95
KUD3D-10.3-51FL-S11-L95	10,3	51	11	95
KUD3D-10.4-51FL-S11-L95	10,4	51	11	95
KUD3D-10.5-51FL-S11-L95	10,5	51	11	95
KUD3D-10.6-51FL-S11-L95	10,6	51	11	95
KUD3D-10.7-51FL-S11-L95	10,7	51	11	95
KUD3D-10.8-51FL-S11-L95	10,8	51	11	95
KUD3D-10.9-51FL-S11-L95	10,9	51	11	95
KUD3D-11.0-51FL-S11-L95	11,0	51	11	95
KUD3D-11.1-54FL-S12-L102	11,1	54	12	102
KUD3D-11.2-54FL-S12-L102	11,2	54	12	102
KUD3D-11.3-54FL-S12-L102	11,3	54	12	102
KUD3D-11.4-54FL-S12-L102	11,4	54	12	102
KUD3D-11.5-54FL-S12-L102	11,5	54	12	102
KUD3D-11.6-54FL-S12-L102	11,6	54	12	102
KUD3D-11.7-54FL-S12-L102	11,7	54	12	102
KUD3D-11.8-54FL-S12-L102	11,8	54	12	102
KUD3D-11.9-54FL-S12-L102	11,9	54	12	102
KUD3D-12.0-54FL-S12-L102	12,0	54	12	102
KUD3D-12.1-57FL-S13-L102	12,1	57	13	102
KUD3D-12.2-57FL-S13-L102	12,2	57	13	102
KUD3D-12.3-57FL-S13-L102	12,3	57	13	102
KUD3D-12.4-57FL-S13-L102	12,4	57	13	102
KUD3D-12.5-57FL-S13-L102	12,5	57	13	102
KUD3D-12.6-57FL-S13-L102	12,6	57	13	102
KUD3D-12.7-57FL-S13-L102	12,7	57	13	102



KUD03

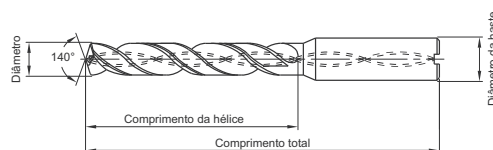


Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD3D-5.1-28FL-S6-L66-C	5,1	28	6	66
KUD3D-5.2-28FL-S6-L66-C	5,2	28	6	66
KUD3D-5.3-28FL-S6-L66-C	5,3	28	6	66
KUD3D-5.4-28FL-S6-L66-C	5,4	28	6	66
KUD3D-5.5-28FL-S6-L66-C	5,5	28	6	66
KUD3D-5.6-30FL-S6-L66-C	5,6	30	6	66
KUD3D-5.7-30FL-S6-L66-C	5,7	30	6	66
KUD3D-5.8-30FL-S6-L66-C	5,8	30	6	66
KUD3D-5.9-30FL-S6-L66-C	5,9	30	6	66
KUD3D-6.0-30FL-S6-L66-C	6,0	30	6	66
KUD3D-6.1-34FL-S7-L74-C	6,1	34	7	74
KUD3D-6.2-34FL-S7-L74-C	6,2	34	7	74
KUD3D-6.3-34FL-S7-L74-C	6,3	34	7	74
KUD3D-6.4-34FL-S7-L74-C	6,4	34	7	74
KUD3D-6.5-34FL-S7-L74-C	6,5	34	7	74
KUD3D-6.6-34FL-S7-L74-C	6,6	34	7	74
KUD3D-6.7-37FL-S7-L74-C	6,7	37	7	74
KUD3D-6.8-37FL-S7-L74-C	6,8	37	7	74
KUD3D-6.9-37FL-S7-L74-C	6,9	37	7	74
KUD3D-7.0-37FL-S7-L74-C	7,0	37	7	74
KUD3D-7.1-40FL-S8-L79-C	7,1	40	8	79
KUD3D-7.2-40FL-S8-L79-C	7,2	40	8	79
KUD3D-7.3-40FL-S8-L79-C	7,3	40	8	79
KUD3D-7.4-40FL-S8-L79-C	7,4	40	8	79
KUD3D-7.5-40FL-S8-L79-C	7,5	40	8	79
KUD3D-7.6-40FL-S8-L79-C	7,6	40	8	79
KUD3D-7.7-40FL-S8-L79-C	7,7	40	8	79
KUD3D-7.8-40FL-S8-L79-C	7,8	40	8	79
KUD3D-7.9-40FL-S8-L79-C	7,9	40	8	79
KUD3D-8.0-40FL-S8-L79-C	8,0	40	8	79
KUD3D-8.1-43FL-S9-L84-C	8,1	43	9	84
KUD3D-8.2-43FL-S9-L84-C	8,2	43	9	84
KUD3D-8.3-43FL-S9-L84-C	8,3	43	9	84
KUD3D-8.4-43FL-S9-L84-C	8,4	43	9	84
KUD3D-8.5-43FL-S9-L84-C	8,5	43	9	84
KUD3D-8.6-43FL-S9-L84-C	8,6	43	9	84
KUD3D-8.7-43FL-S9-L84-C	8,7	43	9	84
KUD3D-8.8-43FL-S9-L84-C	8,8	43	9	84
KUD3D-8.9-43FL-S9-L84-C	8,9	43	9	84
KUD3D-9.0-43FL-S9-L84-C	9,0	43	9	84

KUD03

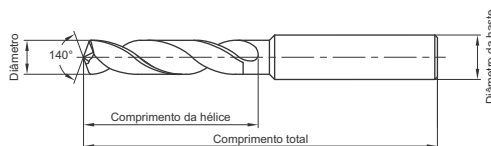


Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD3D-9.1-47FL-S10-L89-C	9,1	47	10	89
KUD3D-9.2-47FL-S10-L89-C	9,2	47	10	89
KUD3D-9.3-47FL-S10-L89-C	9,3	47	10	89
KUD3D-9.4-47FL-S10-L89-C	9,4	47	10	89
KUD3D-9.5-47FL-S10-L89-C	9,5	47	10	89
KUD3D-9.6-47FL-S10-L89-C	9,6	47	10	89
KUD3D-9.7-47FL-S10-L89-C	9,7	47	10	89
KUD3D-9.8-47FL-S10-L89-C	9,8	47	10	89
KUD3D-9.9-47FL-S10-L89-C	9,9	47	10	89
KUD3D-10.0-47FL-S10-L89-C	10,0	47	10	89
KUD3D-10.1-51FL-S11-L95-C	10,1	51	11	95
KUD3D-10.2-51FL-S11-L95-C	10,2	51	11	95
KUD3D-10.3-51FL-S11-L95-C	10,3	51	11	95
KUD3D-10.4-51FL-S11-L95-C	10,4	51	11	95
KUD3D-10.5-51FL-S11-L95-C	10,5	51	11	95
KUD3D-10.6-51FL-S11-L95-C	10,6	51	11	95
KUD3D-10.7-51FL-S11-L95-C	10,7	51	11	95
KUD3D-10.8-51FL-S11-L95-C	10,8	51	11	95
KUD3D-10.9-51FL-S11-L95-C	10,9	51	11	95
KUD3D-11.0-51FL-S11-L95-C	11,0	51	11	95
KUD3D-11.1-54FL-S12-L102-C	11,1	54	12	102
KUD3D-11.2-54FL-S12-L102-C	11,2	54	12	102
KUD3D-11.3-54FL-S12-L102-C	11,3	54	12	102
KUD3D-11.4-54FL-S12-L102-C	11,4	54	12	102
KUD3D-11.5-54FL-S12-L102-C	11,5	54	12	102
KUD3D-11.6-54FL-S12-L102-C	11,6	54	12	102
KUD3D-11.7-54FL-S12-L102-C	11,7	54	12	102
KUD3D-11.8-54FL-S12-L102-C	11,8	54	12	102
KUD3D-11.9-54FL-S12-L102-C	11,9	54	12	102
KUD3D-12.0-54FL-S12-L102-C	12,0	54	12	102
KUD3D-12.1-57FL-S13-L102-C	12,1	57	13	102
KUD3D-12.2-57FL-S13-L102-C	12,2	57	13	102
KUD3D-12.3-57FL-S13-L102-C	12,3	57	13	102
KUD3D-12.4-57FL-S13-L102-C	12,4	57	13	102
KUD3D-12.5-57FL-S13-L102-C	12,5	57	13	102
KUD3D-12.6-57FL-S13-L102-C	12,6	57	13	102
KUD3D-12.7-57FL-S13-L102-C	12,7	57	13	102

KUD05

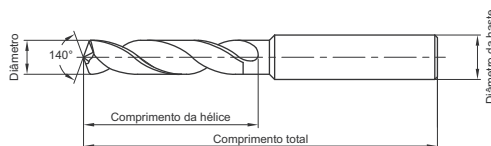


Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD5D-3.0-25FL-S3-L60	3,0	25	3	60
KUD5D-3.1-27FL-S4-L60	3,1	27	4	60
KUD5D-3.2-27FL-S4-L60	3,2	27	4	60
KUD5D-3.3-27FL-S4-L60	3,3	27	4	60
KUD5D-3.4-30FL-S4-L65	3,4	30	4	65
KUD5D-3.5-30FL-S4-L65	3,5	30	4	65
KUD5D-3.6-30FL-S4-L65	3,6	30	4	65
KUD5D-3.7-30FL-S4-L65	3,7	30	4	65
KUD5D-3.8-33FL-S4-L71	3,8	33	4	71
KUD5D-3.9-33FL-S4-L71	3,9	33	4	71
KUD5D-4.0-33FL-S4-L71	4,0	33	4	71
KUD5D-4.1-33FL-S5-L71	4,1	33	5	71
KUD5D-4.2-33FL-S5-L71	4,2	33	5	71
KUD5D-4.3-36FL-S5-L71	4,3	36	5	71
KUD5D-4.4-36FL-S5-L71	4,4	36	5	71
KUD5D-4.5-36FL-S5-L71	4,5	36	5	71
KUD5D-4.6-36FL-S5-L71	4,6	36	5	71
KUD5D-4.7-36FL-S5-L71	4,7	36	5	71
KUD5D-4.8-39FL-S5-L71	4,8	39	5	71
KUD5D-4.9-39FL-S5-L71	4,9	39	5	71
KUD5D-5.0-39FL-S5-L71	5,0	39	5	71
KUD5D-5.1-39FL-S6-L83	5,1	39	6	83
KUD5D-5.2-39FL-S6-L83	5,2	39	6	83
KUD5D-5.3-39FL-S6-L83	5,3	39	6	83
KUD5D-5.4-43FL-S6-L83	5,4	43	6	83
KUD5D-5.5-43FL-S6-L83	5,5	43	6	83
KUD5D-5.6-43FL-S6-L83	5,6	43	6	83
KUD5D-5.7-43FL-S6-L83	5,7	43	6	83
KUD5D-5.8-43FL-S6-L83	5,8	43	6	83
KUD5D-5.9-43FL-S6-L83	5,9	43	6	83
KUD5D-6.0-43FL-S6-L83	6,0	43	6	83

KUD05

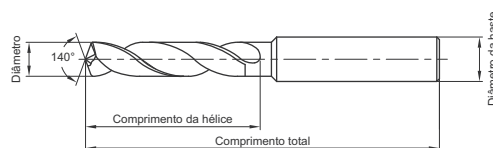


Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD5D-6.1-47FL-S7-L87	6,1	47	7	87
KUD5D-6.2-47FL-S7-L87	6,2	47	7	87
KUD5D-6.3-47FL-S7-L87	6,3	47	7	87
KUD5D-6.4-47FL-S7-L87	6,4	47	7	87
KUD5D-6.5-47FL-S7-L87	6,5	47	7	87
KUD5D-6.6-47FL-S7-L87	6,6	47	7	87
KUD5D-6.7-47FL-S7-L87	6,7	47	7	87
KUD5D-6.8-47FL-S7-L87	6,8	47	7	87
KUD5D-6.9-47FL-S7-L87	6,9	47	7	87
KUD5D-7.0-47FL-S7-L87	7,0	47	7	87
KUD5D-7.1-52FL-S8-L92	7,1	52	8	92
KUD5D-7.2-52FL-S8-L92	7,2	52	8	92
KUD5D-7.3-52FL-S8-L92	7,3	52	8	92
KUD5D-7.4-52FL-S8-L92	7,4	52	8	92
KUD5D-7.5-52FL-S8-L92	7,5	52	8	92
KUD5D-7.6-52FL-S8-L92	7,6	52	8	92
KUD5D-7.7-52FL-S8-L92	7,7	52	8	92
KUD5D-7.8-52FL-S8-L92	7,8	52	8	92
KUD5D-7.9-52FL-S8-L92	7,9	52	8	92
KUD5D-8.0-52FL-S8-L92	8,0	52	8	92
KUD5D-8.1-56FL-S9-L96	8,1	56	9	96
KUD5D-8.2-56FL-S9-L96	8,2	56	9	96
KUD5D-8.3-56FL-S9-L96	8,3	56	9	96
KUD5D-8.4-56FL-S9-L96	8,4	56	9	96
KUD5D-8.5-56FL-S9-L96	8,5	56	9	96
KUD5D-8.6-56FL-S9-L96	8,6	56	9	96
KUD5D-8.7-56FL-S9-L96	8,7	56	9	96
KUD5D-8.8-56FL-S9-L96	8,8	56	9	96
KUD5D-8.9-56FL-S9-L96	8,9	56	9	96
KUD5D-9.0-56FL-S9-L96	9,0	56	9	96

KUD05

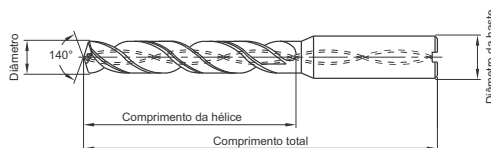


Cobertura

ALTiN

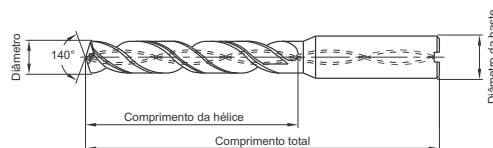
Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD5D-9.1-62FL-S10-L105	9,1	62	10	105
KUD5D-9.2-62FL-S10-L105	9,2	62	10	105
KUD5D-9.3-62FL-S10-L105	9,3	62	10	105
KUD5D-9.4-62FL-S10-L105	9,4	62	10	105
KUD5D-9.5-62FL-S10-L105	9,5	62	10	105
KUD5D-9.6-62FL-S10-L105	9,6	62	10	105
KUD5D-9.7-62FL-S10-L105	9,7	62	10	105
KUD5D-9.8-62FL-S10-L105	9,8	62	10	105
KUD5D-9.9-62FL-S10-L105	9,9	62	10	105
KUD5D-10.0-62FL-S10-L105	10,0	62	10	105
KUD5D-10.1-68FL-S11-L115	10,1	68	11	115
KUD5D-10.2-68FL-S11-L115	10,2	68	11	115
KUD5D-10.3-68FL-S11-L115	10,3	68	11	115
KUD5D-10.4-68FL-S11-L115	10,4	68	11	115
KUD5D-10.5-68FL-S11-L115	10,5	68	11	115
KUD5D-10.6-68FL-S11-L115	10,6	68	11	115
KUD5D-10.7-68FL-S11-L115	10,7	68	11	115
KUD5D-10.8-68FL-S11-L115	10,8	68	11	115
KUD5D-10.9-68FL-S11-L115	10,9	68	11	115
KUD5D-11.0-68FL-S11-L115	11,0	68	11	115
KUD5D-11.1-71FL-S12-L121	11,1	71	12	121
KUD5D-11.2-71FL-S12-L121	11,2	71	12	121
KUD5D-11.3-71FL-S12-L121	11,3	71	12	121
KUD5D-11.4-71FL-S12-L121	11,4	71	12	121
KUD5D-11.5-71FL-S12-L121	11,5	71	12	121
KUD5D-11.6-71FL-S12-L121	11,6	71	12	121
KUD5D-11.7-71FL-S12-L121	11,7	71	12	121
KUD5D-11.8-71FL-S12-L121	11,8	71	12	121
KUD5D-11.9-71FL-S12-L121	11,9	71	12	121
KUD5D-12.0-71FL-S12-L121	12,0	71	12	121
KUD5D-12.1-75FL-S13-L125	12,1	75	13	125
KUD5D-12.2-75FL-S13-L125	12,2	75	13	125
KUD5D-12.3-75FL-S13-L125	12,3	75	13	125
KUD5D-12.4-75FL-S13-L125	12,4	75	13	125
KUD5D-12.5-75FL-S13-L125	12,5	75	13	125
KUD5D-12.6-75FL-S13-L125	12,6	75	13	125
KUD5D-12.7-75FL-S13-L125	12,7	75	13	125

KUD05



Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD5D-5.1-39FL-S6-L83-C	5,1	39	6	83
KUD5D-5.2-39FL-S6-L83-C	5,2	39	6	83
KUD5D-5.3-39FL-S6-L83-C	5,3	39	6	83
KUD5D-5.4-43FL-S6-L83-C	5,4	43	6	83
KUD5D-5.5-43FL-S6-L83-C	5,5	43	6	83
KUD5D-5.6-43FL-S6-L83-C	5,6	43	6	83
KUD5D-5.7-43FL-S6-L83-C	5,7	43	6	83
KUD5D-5.8-43FL-S6-L83-C	5,8	43	6	83
KUD5D-5.9-43FL-S6-L83-C	5,9	43	6	83
KUD5D-6.0-43FL-S6-L83-C	6,0	43	6	83
KUD5D-6.1-47FL-S7-L87-C	6,1	47	7	87
KUD5D-6.2-47FL-S7-L87-C	6,2	47	7	87
KUD5D-6.3-47FL-S7-L87-C	6,3	47	7	87
KUD5D-6.4-47FL-S7-L87-C	6,4	47	7	87
KUD5D-6.5-47FL-S7-L87-C	6,5	47	7	87
KUD5D-6.6-47FL-S7-L87-C	6,6	47	7	87
KUD5D-6.7-47FL-S7-L87-C	6,7	47	7	87
KUD5D-6.8-47FL-S7-L87-C	6,8	47	7	87
KUD5D-6.9-47FL-S7-L87-C	6,9	47	7	87
KUD5D-7.0-47FL-S7-L87-C	7,0	47	7	87
KUD5D-7.1-52FL-S8-L92-C	7,1	52	8	92
KUD5D-7.2-52FL-S8-L92-C	7,2	52	8	92
KUD5D-7.3-52FL-S8-L92-C	7,3	52	8	92
KUD5D-7.4-52FL-S8-L92-C	7,4	52	8	92
KUD5D-7.5-52FL-S8-L92-C	7,5	52	8	92
KUD5D-7.6-52FL-S8-L92-C	7,6	52	8	92
KUD5D-7.7-52FL-S8-L92-C	7,7	52	8	92
KUD5D-7.8-52FL-S8-L92-C	7,8	52	8	92
KUD5D-7.9-52FL-S8-L92-C	7,9	52	8	92
KUD5D-8.0-52FL-S8-L92-C	8,0	52	8	92
KUD5D-8.1-56FL-S9-L96-C	8,1	56	9	96
KUD5D-8.2-56FL-S9-L96-C	8,2	56	9	96
KUD5D-8.3-56FL-S9-L96-C	8,3	56	9	96
KUD5D-8.4-56FL-S9-L96-C	8,4	56	9	96
KUD5D-8.5-56FL-S9-L96-C	8,5	56	9	96
KUD5D-8.6-56FL-S9-L96-C	8,6	56	9	96
KUD5D-8.7-56FL-S9-L96-C	8,7	56	9	96
KUD5D-8.8-56FL-S9-L96-C	8,8	56	9	96
KUD5D-8.9-56FL-S9-L96-C	8,9	56	9	96
KUD5D-9.0-56FL-S9-L96-C	9,0	56	9	96

KUD05



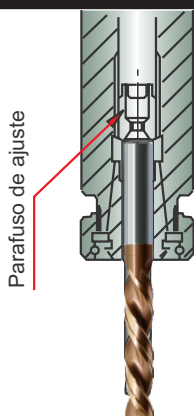
Cobertura

ALTIN

Descrição	Diâmetro	Comprimento da hélice	Diâmetro da haste	Comprimento total
KUD5D-9.1-62FL-S10-L105-C	9,1	62	10	105
KUD5D-9.2-62FL-S10-L105-C	9,2	62	10	105
KUD5D-9.3-62FL-S10-L105-C	9,3	62	10	105
KUD5D-9.4-62FL-S10-L105-C	9,4	62	10	105
KUD5D-9.5-62FL-S10-L105-C	9,5	62	10	105
KUD5D-9.6-62FL-S10-L105-C	9,6	62	10	105
KUD5D-9.7-62FL-S10-L105-C	9,7	62	10	105
KUD5D-9.8-62FL-S10-L105-C	9,8	62	10	105
KUD5D-9.9-62FL-S10-L105-C	9,9	62	10	105
KUD5D-10.0-62FL-S10-L105-C	10,0	62	10	105
KUD5D-10.1-68FL-S11-L115-C	10,1	68	11	115
KUD5D-10.2-68FL-S11-L115-C	10,2	68	11	115
KUD5D-10.3-68FL-S11-L115-C	10,3	68	11	115
KUD5D-10.4-68FL-S11-L115-C	10,4	68	11	115
KUD5D-10.5-68FL-S11-L115-C	10,5	68	11	115
KUD5D-10.6-68FL-S11-L115-C	10,6	68	11	115
KUD5D-10.7-68FL-S11-L115-C	10,7	68	11	115
KUD5D-10.8-68FL-S11-L115-C	10,8	68	11	115
KUD5D-10.9-68FL-S11-L115-C	10,9	68	11	115
KUD5D-11.0-68FL-S11-L115-C	11,0	68	11	115
KUD5D-11.1-71FL-S12-L121-C	11,1	71	12	121
KUD5D-11.2-71FL-S12-L121-C	11,2	71	12	121
KUD5D-11.3-71FL-S12-L121-C	11,3	71	12	121
KUD5D-11.4-71FL-S12-L121-C	11,4	71	12	121
KUD5D-11.5-71FL-S12-L121-C	11,5	71	12	121
KUD5D-11.6-71FL-S12-L121-C	11,6	71	12	121
KUD5D-11.7-71FL-S12-L121-C	11,7	71	12	121
KUD5D-11.8-71FL-S12-L121-C	11,8	71	12	121
KUD5D-11.9-71FL-S12-L121-C	11,9	71	12	121
KUD5D-12.0-71FL-S12-L121-C	12,0	71	12	121
KUD5D-12.1-75FL-S13-L125-C	12,1	75	13	125
KUD5D-12.2-75FL-S13-L125-C	12,2	75	13	125
KUD5D-12.3-75FL-S13-L125-C	12,3	75	13	125
KUD5D-12.4-75FL-S13-L125-C	12,4	75	13	125
KUD5D-12.5-75FL-S13-L125-C	12,5	75	13	125
KUD5D-12.6-75FL-S13-L125-C	12,6	75	13	125
KUD5D-12.7-75FL-S13-L125-C	12,7	75	13	125

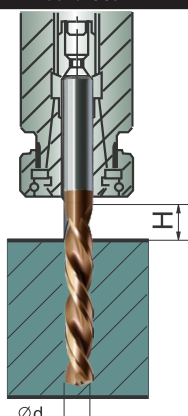
Guia de aplicação das brocas

Fixação da broca



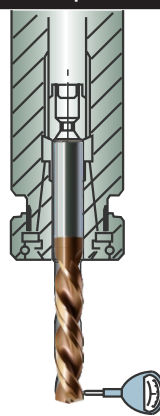
Garanta uma fixação rígida usando o mandril de pinça do tipo rolamento axial.

Comprimento de aperto da broca



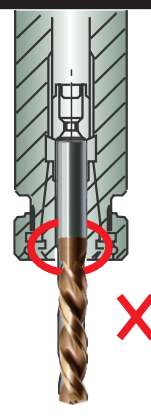
Certifique-se de que a cota H é acima de $1,5 \times d$

Batimento radial da broca presa



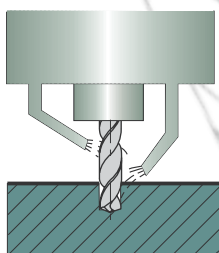
O batimento radial deve estar abaixo de 0,02 mm.

Fixação da broca errada



Não prenda na hélice da broca

Método correto de refrigeração externa



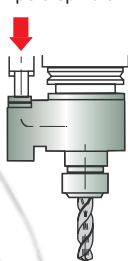
A refrigeração deve ser direcionada na ponta e no meio da broca conforme a figura

Métodos de refrigeração interna:

Refrigeração através do spindle



Refrigeração não passa pelo spindle



A pressão da refrigeração varia entre 5 - 10Bar (porém quando o diâmetro é inferior a 5mm a pressão da refrigeração pode ficar entre 20 e 30Bar)
O volume da refrigeração é de 1,5-4LPM

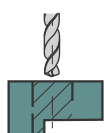
Cuidados ao usar refrigeração

Quando usar refrigeração interna

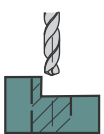
; Pequenas partículas de cavacos e poeira poderão causar obstrução na saída do óleo. Um filtro de malha fina deve ser usado para evitar tal obstrução, especialmente para brocas de diâmetros pequenos.

; Partículas de sujeira e poeira irão aderir na saída do furo da broca e tornar o fluxo de refrigeração irregular. Recomenda-se a manutenção ou troca da refrigeração o mais breve possível

Cuidados com cortes interrompidos



Para ser furado
Reduza a taxa de avanço ao furar peças interrompidas

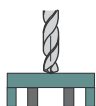


Pré usine antes de furar
Rebaixar com fresa de topo antes da furação

Método correto para peças finas

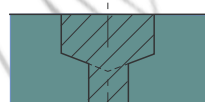


Ocorrência de flexão



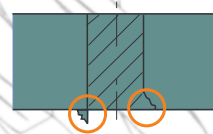
Adicionar um apoio

Método de furos escalonados



; Divida a operação em dois processos;
; Primeiro faça o diâmetro maior;
; Conclua com o diâmetro menor

Rebarbas e lascas na saída do furo



; Reduza a taxa de avanço ao se aproximar da saída.
; Chanfre a saída do furo
< Altere o ângulo da ponta.

Recomendações de corte

Material	Dureza	Dureza HB	Dureza HRC	Velocidade de corte m / min	Avanço (mm / rev)/ Diâmetro				
					Ø1-Ø3	>Ø3-Ø6	>Ø6-Ø9	>Ø9-Ø12	>Ø12-Ø12,7
Aços estruturais	< 500 N/mm ²	149	–	90	0,05 – 0,08	0,085 – 0,1	0,1 – 0,15	0,15 – 0,2	0,2 – 0,25
	< 650 N/mm ²	190	–	80	0,05 – 0,08	0,085 – 0,1	0,1 – 0,15	0,15 – 0,2	0,2 – 0,25
	< 850 N/mm ²	250	25	70	0,03 – 0,05	0,05 – 0,085	0,085 – 0,12	0,1 – 0,18	0,15 – 0,2
Aços endurecidos	< 800 N/mm ²	238	22	75	0,05 – 0,08	0,085 – 0,1	0,1 – 0,15	0,15 – 0,2	0,2 – 0,25
	< 1000 N/mm ²	300	31,5	70	0,03 – 0,05	0,05 – 0,085	0,085 – 0,12	0,1 – 0,18	0,15 – 0,2
Aços nitretados	< 1000 N/mm ²	300	31,5	70	0,03 – 0,05	0,05 – 0,085	0,085 – 0,12	0,1 – 0,18	0,15 – 0,2
	< 1300 N/mm ²	383	41	60	0,03 – 0,05	0,05 – 0,085	0,085 – 0,12	0,1 – 0,18	0,15 – 0,2
Aços tratados	< 700 N/mm ²	208	–	85	0,05 – 0,08	0,085 – 0,1	0,1 – 0,15	0,15 – 0,2	0,2 – 0,25
	< 900 N/mm ²	266	27	75	0,05 – 0,08	0,085 – 0,1	0,1 – 0,15	0,15 – 0,2	0,2 – 0,25
	< 1200 N/mm ²	354	38	60	0,01 – 0,02	0,025 – 0,06	0,06 – 0,09	0,085 – 0,13	0,1 – 0,15
	< 1400 N/mm ²	413	44	45	0,01 – 0,02	0,025 – 0,06	0,06 – 0,09	0,085 – 0,13	0,1 – 0,15
Aços ferramentas	< 800 N/mm ²	238	22	45	0,01 – 0,03	0,02 – 0,06	0,05 – 0,08	0,075 – 0,1	0,08 – 0,12
	< 1000 N/mm ²	300	31,5	35	0,01 – 0,03	0,02 – 0,06	0,05 – 0,08	0,075 – 0,1	0,08 – 0,12
	< 1200 N/mm ²	354	38	30	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1
	< 1400 N/mm ²	413	44	25	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1
	> 1400 N/mm ²	413	44	20	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1
Aço fundido	< 500 N/mm ²	149	–	70	0,02 – 0,06	0,05 – 0,09	0,07 – 0,12	0,09 – 0,15	0,1 – 0,18
	< 650 N/mm ²	190	–	55	0,02 – 0,06	0,05 – 0,09	0,07 – 0,12	0,09 – 0,15	0,1 – 0,18
	> 650 N/mm ²	190	–	35	0,02 – 0,06	0,05 – 0,09	0,07 – 0,12	0,09 – 0,15	0,1 – 0,18
Aço fundido (duro)	–	–	–	35	0,01 – 0,03	0,02 – 0,06	0,05 – 0,08	0,06 – 0,09	0,07 – 0,1
Aço inoxidável	< 700 N/mm ²	208	–	45	0,015 – 0,03	0,025 – 0,06	0,05 – 0,1	0,075 – 0,13	0,1 – 0,17
	< 850 N/mm ²	250	–	25	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1
	< 950 N/mm ²	280	–	20	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1
Ferro fundido nodular	–	< 200 HB	–	75	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
	–	> 200 HB	–	55	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
Ferro fundido cinzento	–	< 200 HB	–	95	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
	–	> 200 HB	–	75	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
Alumínio	–	–	–	180	0,03 – 0,05	0,05 – 0,125	0,1 – 0,18	0,15 – 0,2	0,17 – 0,3
Alumínio (alto teor de silício)	–	–	–	110	0,03 – 0,05	0,05 – 0,125	0,1 – 0,18	0,15 – 0,2	0,17 – 0,3
Ligas resistentes ao calor	< 700 N/mm ²	208	–	30	0,01 – 0,03	0,02 – 0,05	0,04 – 0,055	0,05 – 0,075	0,06 – 0,1
	< 900 N/mm ²	266	27	20	0,01 – 0,03	0,02 – 0,05	0,04 – 0,055	0,05 – 0,075	0,06 – 0,1
	< 1100 N/mm ²	321	35,5	15	0,01 – 0,03	0,02 – 0,05	0,04 – 0,055	0,05 – 0,075	0,06 – 0,1
	< 1250 N/mm ²	365	39,5	13	0,01 – 0,02	0,015 – 0,04	0,035 – 0,045	0,04 – 0,06	0,05 – 0,08
	< 1400 N/mm ²	413	44	10	0,008 – 0,01	0,01 – 0,03	0,025 – 0,035	0,03 – 0,04	0,035 – 0,05
	> 1400 N/mm ²	413	44	7	0,008 – 0,01	0,01 – 0,03	0,025 – 0,035	0,03 – 0,04	0,035 – 0,05
Ligas de titânio	< 550 N/mm ²	165	–	35	0,01 – 0,03	0,02 – 0,05	0,04 – 0,055	0,05 – 0,075	0,06 – 0,1
	< 950 N/mm ²	280	29,5	25	0,01 – 0,025	0,015 – 0,04	0,035 – 0,045	0,04 – 0,06	0,05 – 0,08
	>1200 N/mm ²	354	38	15	0,01 – 0,025	0,015 – 0,04	0,035 – 0,045	0,04 – 0,06	0,05 – 0,08
Cobre	< 500 N/mm ²	149	–	75	0,015 – 0,03	0,025 – 0,06	0,05 – 0,08	0,075 – 0,09	0,08 – 0,12
Ligas de cobre	–	–	–	100	0,015 – 0,03	0,025 – 0,06	0,05 – 0,08	0,075 – 0,09	0,08 – 0,12
Ligas de magnésio	–	–	–	160	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
Ligas de zinco	–	–	–	120	0,03 – 0,05	0,05 – 0,085	0,085 – 0,12	0,1 – 0,18	0,15 – 0,2
Plásticos	–	–	–	120	0,03 – 0,06	0,04 – 0,1	0,08 – 0,15	0,09 – 0,17	0,12 – 0,23
Fibra de plástico	–	–	–	100	0,01 – 0,02	0,015 – 0,04	0,035 – 0,055	0,045 – 0,08	0,075 – 0,1

** As recomendações de corte devem ser inicialmente consideradas como referência, podendo haver variações para alcançar os melhores resultados.



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