

Plunging Tools

PDL

Indexable Plunge Drill

PCT

Indexable Plunge Mill



- Achieving stable and high efficiency machining in long overhang conditions.
- Producing nearly flat bottom profiles with a straight cutting edge design.
- A variety of inserts available to cover a wide range of work materials. (Using the same type of inserts as the SumiDrill WDX series)



Indexable Plunge Drill / Plunge Mill

PDL Type / PCT Type



Description

The tool cuts in the Z axis direction where tool rigidity is highest, allowing high efficiency roughing for aeronautic components and dies with long tool overhang must be used to machine deep holes and pockets.

Characteristics:

The flat cutting edge design produces near-flat bottom profiles to reduce depth of cut variation during finishing.

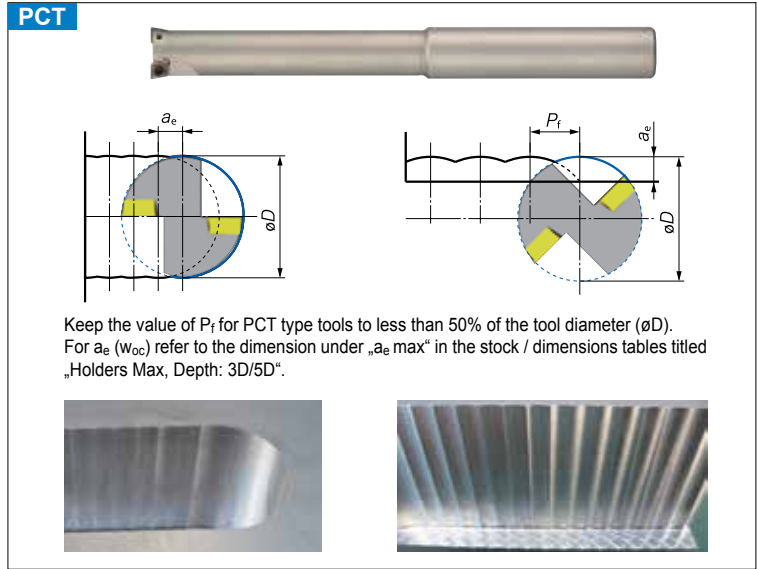
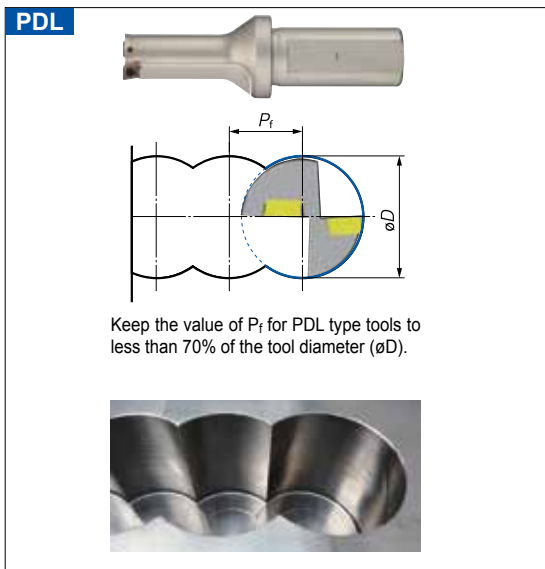
All sizes come with an air hole for supplying coolant internally to improve chip evacuation.

Durable body with special surface treatment offers improved tool life and reliability.

The tools use SumiDrill WDX type inserts for handling a wide range of work materials, from steel to non-ferrous metals and exotic alloys.

The **PDL type** has a central insert making it possible to make radial cuts beyond the tool's radius, pitch feed cutting and drilling. (Pocketing milling, etc.)

Although the **PCT type** has limited radial cutting ability, the tool has many effective teeth enabling it to perform high feed cutting. (Medium finishing of corners, hole expansion, deep grooving, etc.)



Application Examples

PDL

Pocketing
Work Material: Ti Alloy

Tool: PDL400D2S40 ($\phi 40$)
Insert: WDXT125012 G
Grade: ACK300

Cutting Data:
 $v_c = 40\text{m/min}$
 $f = 0,07\text{mm/rev}$
($v_f = 22,3\text{mm/min}$)
 $P_f = 25\text{mm}$

PDL

Drilling
Work Material: X4CrNiMo17122

Tool: PDL200D3S25 ($\phi 20$)
Insert: WDXT063006 G
Grade: ACP300

Cutting Data:
 $v_c = 180\text{m/min}$
 $f = 0,10\text{mm/rev}$
($v_f = 286\text{mm/min}$)
 $\phi D = 20\text{mm}$

PCT

Corner Finishing
Work Material: Ti Alloy

Tool: PCT320D3S32 ($\phi 32$)
PCT250D3S25 ($\phi 25$)
PCT200D3S20 ($\phi 20$)
Grade: ACK300

Insert: WDXT094008 G
WDXT073506 G
WDXT063006 G

Cutting Data:
 $v_c = 50\text{m/min}$
 $f_t = 0,08\text{mm/tooth}$
($v_f = 80 \sim 127\text{mm/min}$)
 a_e (W_{oc}) = 3,2~6,5mm

PCT

Grooving
Work Material: Ti Alloy

Tool: PCT320D5S32 ($\phi 32$)
Insert: WDXT094008 G
Grade: ACK300

Cutting Data:
 $v_c = 40\text{m/min}$
 $f_t = 0,07\text{mm/tooth}$
($v_f = 56\text{mm/min}$)
 a_e (P_f) = 5,0mm

PCT

Aeronautic Components
Work Material: X5CrNi1810

Tool: PCT320D3S32 ($\phi 32$)
Insert: WDXT094008 G
Grade: ACP300

Cutting Data:
 $v_c = 180\text{m/min}$
 $f_t = 0,15\text{mm/tooth}$
($v_f = 537\text{mm/min}$)
 a_e (W_{oc}) = 7,0mm, $P_f = 5,0\text{mm}$

PCT

Machine Components
Work Material: 34CrNi4

Tool: PCT200D5S20 ($\phi 20$)
Insert: WDXT063006 G
Grade: ACK300

Cutting Data:
 $v_c = 150\text{m/min}$
 $f_t = 0,15\text{mm/tooth}$
($v_f = 716\text{mm/min}$)
 a_e (W_{oc}) = 3,5mm

Indexable Plunge Drill / Plunge Mill PDL Type / PCT Type

Indexable Plunge Drill - PDL Type (2D, 3D)

Fig. 1

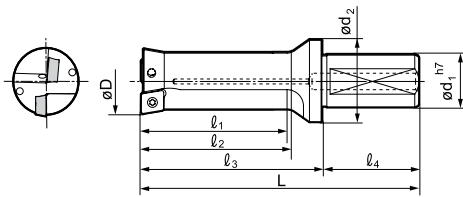
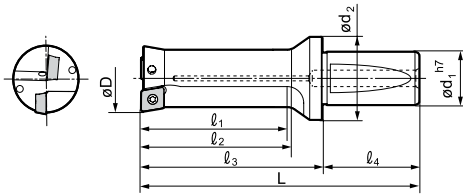


Fig. 2



Holder (max D_{oc}: 2D)

Cat. No.	Stock	Dimensions (mm)								Applicable Insert	Fig.
		ØD	L	l ₁	l ₂	l ₃	l ₄	Ød ₁	Ød ₂		
PDL 160D2S20	●	16,0	94	32	35	50	44	20	20	WDXT052504	1
200D2S25	●	20,0	114	40	43	58	56	25	25	WDXT063006	
250D2S25	●	25,0	127	50	53	71	56	25	25	WDXT073506	
PDL 320D2S40	●	32,0	162	64	68	92	70	40	40	WDXT094008	2
400D2S40	●	40,0	185	80	85	115	70	40	40	WDXT125012	

Holder (max D_{oc}: 3D)

Cat. No.	Stock	Dimensions (mm)								Applicable Insert	Fig.
		ØD	L	l ₁	l ₂	l ₃	l ₄	Ød ₁	Ød ₂		
PDL 160D3S20	●	16,0	110	48	51	66	44	20	20	WDXT052504	1
200D3S25	●	20,0	134	60	63	78	56	25	25	WDXT063006	
250D3S25	●	25,0	152	75	78	96	56	25	25	WDXT073506	
PDL 320D3S40	●	32,0	194	96	100	124	70	40	40	WDXT094008	2
400D3S40	●	40,0	225	120	125	155	70	40	40	WDXT125012	

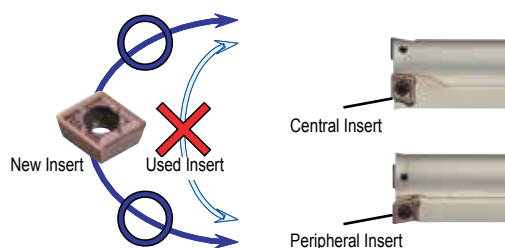
Spare Parts

Screw	Wrench	Wrench	Recommended Torque (N·m)	Applicable Holder
BFTX0204N	TRX06	-	0,5	PDL 160 D2 S20 PCT 160 D3 S20
BFTY02206	-	TRD07	1,0	PCT 160 D3 S16 160 D5 S16
BFTX02506N	-	TRD08	1,5	PDL 200 D2 S25 200 D3 S25
BFTX03584	-	TRD15	3,5	PCT 200 D3 S20 200 D5 S20
BFTX0511N	-	TRD20	5,0	PDL 250 D2 S25 250 D3 S25
				PCT 250 D3 S25 250 D5 S25
				PDL 320 D2 S40 320 D3 S40
				PCT 320 D3 S32 350 D5 S32
				PDL 400 D2 S40 400 D3 S40
				PCT 400 D3 S42 400 D5 S42

● Euro stock

○ Japan stock

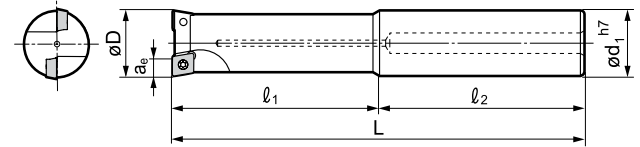
Notes about Mounting Inserts



PDL type: Inserts can be used on either the centre or the outside.
Inserts used on the outside cannot be used in the centre.
Similarly, inserts used in the centre cannot be used on the outside.
PCT type: 2 corners can be used only for the outer inserts.

Indexable Plunge Mill - PCT Type (3D, 5D)

Fig. 3



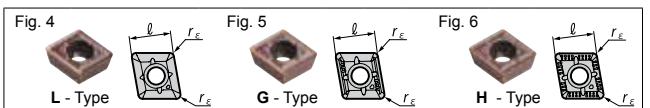
Holder (max D_{oc}: 3D)

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Applicable Insert	Fig.
		ØD	a _e max	L	l ₁	l ₂	Ød ₁					
PCT 160D3S16	●	16,0	4,0	123	53	70	16			2	WDXT052504	3
200D3S20	●	20,0	5,0	145	65	80	20			2	WDXT063006	
250D3S25	●	25,0	6,5	160	80	80	25			2	WDXT073506	
PCT 320D3S32	●	32,0	8,5	191	101	90	32			2	WDXT094008	3
400D3S42	●	40,0	11,0	225	125	100	42			3	WDXT125012	

Holder (max D_{oc}: 5D)

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Applicable Insert	Fig.
		ØD	a _e max	L	l ₁	l ₂	Ød ₁					
PCT 160D5S16	●	16,0	4,0	155	85	70	16			2	WDXT052504	3
200D5S20	●	20,0	5,0	185	105	80	20			2	WDXT063006	
250D5S25	●	25,0	6,5	210	130	80	25			2	WDXT073506	
PCT 320D5S32	●	32,0	8,5	255	165	90	32			2	WDXT094008	3
400D5S42	●	40,0	11,0	305	205	100	42			3	WDXT125012	

Inserts



Application	Grade
High Speed / Light cutting	N
General Purpose	M
Roughing	P, K

Cat. No.	ACP300	ACK300	DL1500	Fig.	Dimensions (mm)			Applicable Holder
					l	Thick-ness	r _ε	
WDXT 052504 L	●	●	○	4				PDL 160 D2 S20
052504 G	●	●	○	5	5,0	2,5	0,4	PCT 160 D3 S20
052504 H	●	●	○	6				PCT 160 D3 S16
								160 D5 S16
WDXT 063006 L	●	●	○	4				PDL 200 D2 S25
063006 G	●	●	○	5	6,0	3,0	0,6	PCT 200 D3 S25
063006 H	●	●	○	6				PCT 200 D3 S20
								200 D5 S20
WDXT 073506 L	●	●	○	4				PDL 250 D2 S25
073506 G	●	●	○	5	7,5	3,5	0,6	PCT 250 D3 S25
073506 H	●	●	○	6				PCT 250 D5 S25
WDXT 094008 L	●	●	○	4				PDL 320 D2 S40
094008 G	●	●	○	5	9,6	4,0	0,8	PCT 320 D3 S40
094008 H	●	●	○	6				PCT 320 D3 S32
								320 D5 S32
WDXT 125012 L	○	○	○	4				PDL 400 D2 S40
125012 G	○	○	○	5	12,4	5,0	1,2	PCT 400 D3 S40
125012 H	○	○	○	6				PCT 400 D3 S42
								400 D5 S42

Identification

Holder:	PCT	250	D3	S25	
	Tool Diameter (Ø 25,0)		Max. Depth L/D (3D)	Shank Size (Ø 25,0)	
Insert:	WDXT	07	35	06	G
	Width Across Flats (7.5)	Thickness x 10 (3.5)	Corner Radius x 10 (R0.6)	Chipbreaker Type	

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PDL Type / PCT Type

Recommended Cutting Conditions

(min. - optimal - max.)

	ISO	Material		(HB)	Chipbreaker / Grade	Cutting Speed v _c (m/min)	Feed Rate (mm/rev)			
						Ø 16,0	Ø 20,0 - Ø 25,0	Ø 32,0	Ø 40,0	
2D	P	Carbon steel		125	G	120-180-240	0,05-0,08-0,10	0,05-0,08-0,10	0,05-0,08-0,11	0,05-0,08-0,12
				125	L	130-170-220	0,04-0,08-0,12	0,04-0,08-0,12	0,04-0,08-0,13	0,05-0,10-0,15
				190	G	100-150-200	0,08-0,13-0,24	0,08-0,13-0,24	0,08-0,14-0,26	0,09-0,16-0,29
				250	G	80-120-160	0,06-0,11-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22
				270	G	100-130-160	0,08-0,13-0,22	0,08-0,13-0,22	0,08-0,14-0,23	0,09-0,16-0,26
				300	G	70-100-140	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
		Low alloyed steel		180	L	100-140-180	0,05-0,08-0,14	0,05-0,08-0,14	0,05-0,08-0,16	0,06-0,09-0,17
				275	G	80-120-160	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
				300	G	75-110-140	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
				350	G	60-85-110	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
				200	G	100-130-160	0,08-0,13-0,24	0,08-0,13-0,24	0,08-0,14-0,26	0,09-0,16-0,29
	High alloyed steel		325	G	80-100-120	0,06-0,11-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22	
		M	Stainless steel,	martensitic / ferritic martensitic / tempered austenitic / quenched austenitic / ferritic (Duplex)	200	G	100-140-180	0,06-0,11-0,18	0,06-0,11-0,18	0,06-0,12-0,19
	240				G	90-120-150	0,06-0,11-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22
	180				G	100-140-180	0,06-0,08-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22
	230				G	80-120-150	0,04-0,08-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22
	K	Cast iron (GG)	180	H	ACK300	120-160-200	0,09-0,20-0,32	0,10-0,22-0,36	0,11-0,24-0,39	0,12-0,26-0,44
			260	H	ACP300	90-120-150	0,09-0,20-0,32	0,10-0,22-0,36	0,11-0,24-0,39	0,12-0,26-0,44
	S	Heat resistant alloy	200	G	ACP300	25- 50- 70	0,06-0,11-0,18	0,06-0,11-0,18	0,06-0,12-0,19	0,07-0,13-0,22
	N	Aluminium alloy Copper alloy		G	DL1500	200-260-320	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
				G	DL1500	180-230-280	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
3D	P	Carbon steel		125	G	120-180-240	0,05-0,07-0,10	0,05-0,07-0,10	0,05-0,08-0,11	0,05-0,08-0,12
				125	L	130-170-220	0,04-0,07-0,10	0,04-0,07-0,10	0,04-0,08-0,11	0,05-0,09-0,12
				190	G	100-150-200	0,08-0,12-0,20	0,08-0,12-0,20	0,08-0,13-0,22	0,09-0,14-0,24
				250	G	80-120-160	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18
				270	G	100-130-160	0,08-0,12-0,18	0,08-0,12-0,18	0,08-0,13-0,19	0,09-0,14-0,22
				300	G	70-100-140	0,06-0,10-0,14	0,06-0,10-0,14	0,06-0,11-0,15	0,07-0,12-0,17
		Low alloyed steel		180	L	100-140-180	0,05-0,07-0,12	0,05-0,07-0,12	0,05-0,07-0,13	0,06-0,07-0,15
				275	G	80-120-160	0,06-0,10-0,14	0,06-0,10-0,14	0,06-0,11-0,15	0,07-0,12-0,17
				300	G	75-110-140	0,06-0,10-0,14	0,06-0,10-0,14	0,06-0,11-0,15	0,07-0,12-0,17
				350	G	60-85-110	0,06-0,10-0,14	0,06-0,10-0,14	0,06-0,11-0,15	0,07-0,12-0,17
				200	G	100-130-160	0,08-0,12-0,20	0,08-0,12-0,20	0,08-0,13-0,22	0,09-0,14-0,24
	High alloyed steel		325	G	80-100-120	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18	
		M	Stainless steel,	martensitic / ferritic martensitic / tempered austenitic / quenched austenitic / ferritic (Duplex)	200	G	100-140-180	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16
	240				G	90-120-150	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18
	180				G	100-140-180	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18
	230				G	80-120-150	0,04-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18
	K	Cast iron (GG)	180	H	ACK300	120-160-200	0,09-0,18-0,27	0,10-0,20-0,30	0,11-0,22-0,32	0,12-0,24-0,36
			260	H	ACP300	90-120-150	0,09-0,18-0,27	0,10-0,20-0,30	0,11-0,22-0,32	0,12-0,24-0,36
	S	Heat resistant alloy	200	G	ACP300	25- 50- 70	0,06-0,10-0,15	0,06-0,10-0,15	0,06-0,11-0,16	0,07-0,12-0,18
	N	Aluminium alloy Copper alloy		G	DL1500	200-260-320	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
				G	DL1500	180-230-280	0,06-0,11-0,17	0,06-0,11-0,17	0,06-0,12-0,18	0,07-0,13-0,20
5D	P	Carbon steel		125	G	120-180-240	0,05-0,06-0,09	0,05-0,06-0,09	0,05-0,06-0,09	0,05-0,07-0,09
				125	L	130-170-220	0,04-0,06-0,08	0,04-0,06-0,08	0,04-0,06-0,08	0,05-0,07-0,09
				190	G	100-150-200	0,07-0,10-0,15	0,07-0,10-0,15	0,08-0,11-0,17	0,09-0,12-0,19
				250	G	80-120-160	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14
				270	G	100-130-160	0,07-0,10-0,14	0,07-0,10-0,14	0,08-0,11-0,15	0,09-0,12-0,17
				300	G	70-100-140	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,13
		Low alloyed steel		180	L	100-140-180	0,05-0,06-0,09	0,05-0,06-0,09	0,05-0,06-0,10	0,05-0,07-0,11
				275	G	80-120-160	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,13
				300	G	75-110-140	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,13
				350	G	60-85-110	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,13
				200	G	100-130-160	0,07-0,10-0,15	0,07-0,10-0,15	0,08-0,11-0,17	0,09-0,12-0,19
	High alloyed steel		325	G	80-100-120	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14	
		M	Stainless steel,	martensitic / ferritic martensitic / tempered austenitic / quenched austenitic / ferritic (Duplex)	200	G	100-140-180	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12
	240				G	90-120-150	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14
	180				G	100-140-180	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14
	230				G	80-120-150	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14
	K	Cast iron (GG)	180	H	ACK300	120-160-200	0,08-0,15-0,21	0,09-0,17-0,23	0,09-0,18-0,25	0,11-0,20-0,28
			260	H	ACP300	90-120-150	0,08-0,15-0,21	0,09-0,17-0,23	0,09-0,18-0,25	0,11-0,20-0,28
	S	Heat resistant alloy	200	G	ACP300	25- 50- 70	0,05-0,09-0,11	0,05-0,09-0,11	0,06-0,09-0,12	0,06-0,10-0,14
	N	Aluminium alloy Copper alloy		G	DL1500	200-260-320	0,05-0,10-0,15	0,05-0,10-0,15	0,06-0,11-0,16	0,06-0,12-0,18
				G	DL1500	180-230-280	0,05-0,10-0,15	0,05-0,10-0,15	0,06-0,11-0,16	0,06-0,12-0,18



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