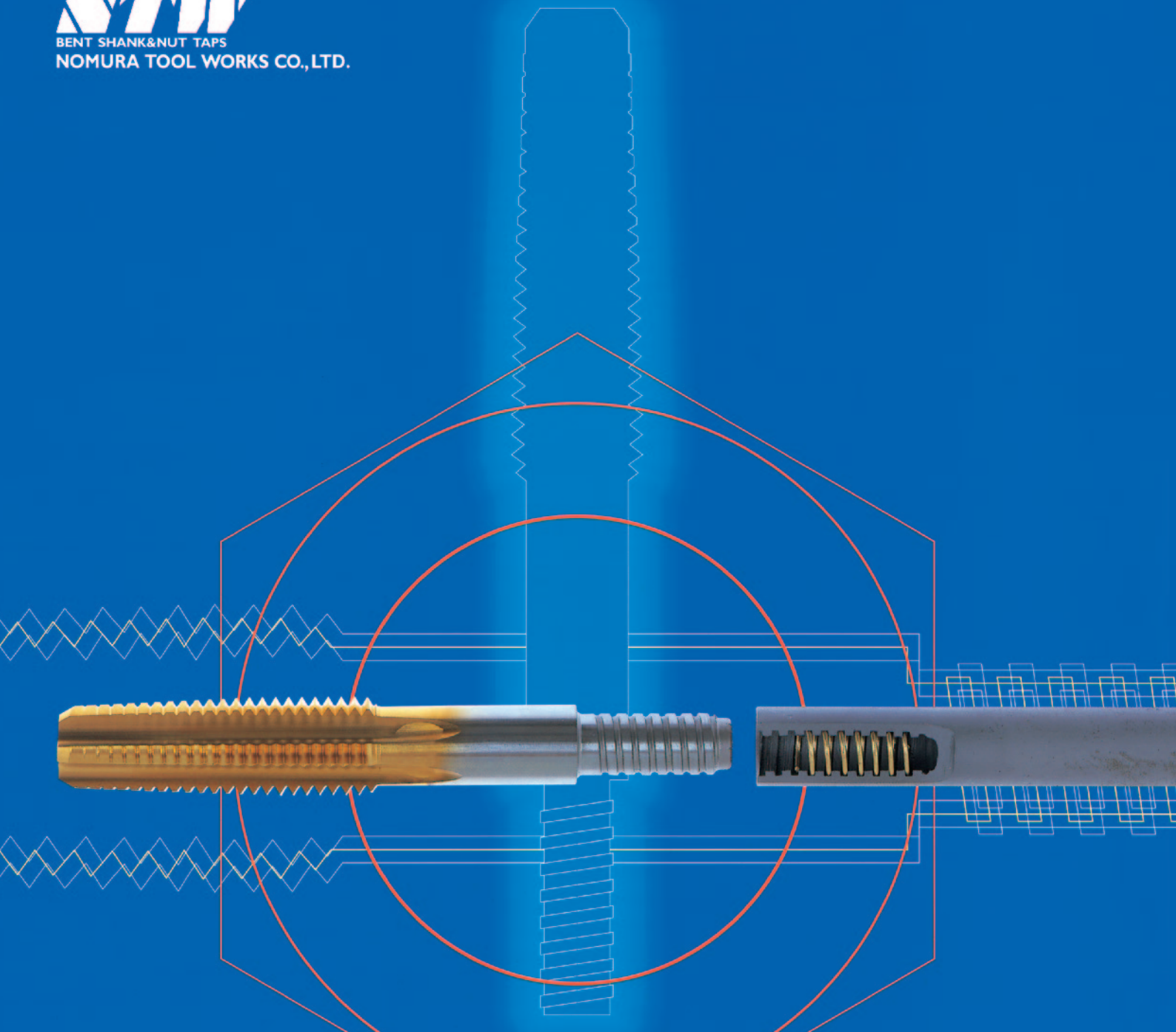
NTW

BENT SHANK&NUT TAPS

NOMURA TOOL WORKS CO., LTD.



A Commitment to the Quality Solutions Your Needs

The Catalogue of
Nomura Tool Works Co., Ltd.

Tool manufacturing since 1954

Bent Shank Taps

Nib Taps

Nut Taps

Introduction

In today's highly developed machine industry, a tap is a cutting tool that requires extremely high level of quality and high performance. Nomura Tool Works responds to the challenge of the industry by researching and developing new steel tools and shapes for taps that are ahead of their time.

Since 1954 we have been producing and shipping taps to various countries in the world. Our long experience has convinced us that the key to success is “Kaizen” (continuous improvement). By Kaizen activities, we nurture our human resources to spot waste (*muda*) in business operations and find the ways to eliminate waste. As a company, we are committed to the Kaizen philosophy to improve continuously our capabilities in production, cost management and service. This results in high quality service for our customers who have high requirements for taps and their performance. As we manufacture a huge variety of different taps, the purpose of this catalogue is only to introduce samples of our taps. Therefore, if your requirements are different, please feel free to contact us.

Lineup of NTW Taps

Bent Shank Taps

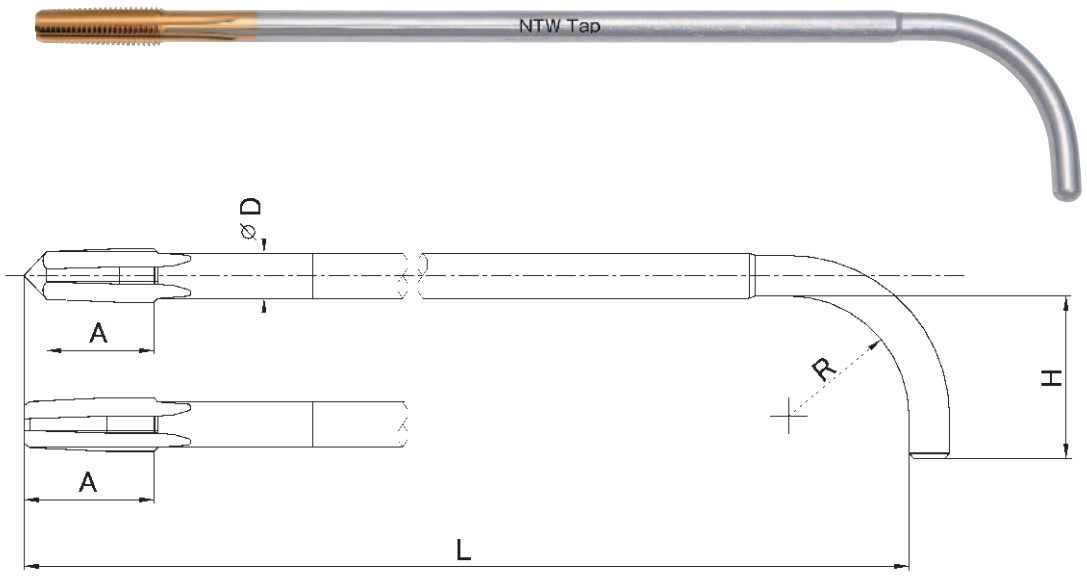


Table 1. Metric Coarse Threads

Nominal size	Threaded portion A (only indicative)	Shank ϕD	No. of flutes	Reference (LxRxH)
M4x0.7	17	3	3	Depends on Machine type. Please contact us about the details.
M4.5x0.75	18	3.5	3	
M5x0.8	19	3.8	3,4,5	
M6x1.0	24	4.5	3,4,5	
M7x1.0	24	5.5	3,4,5	
M8x1.25	30	6.4	3,4,5,6	
M9x1.25	30	7.3	3,4,5,6	
M10x1.5	36	7.8	3,4,5,6	
M11x1.5	36	8.5	3,4,5,6	
M12x1.75	42	9.5	3,4,5,6	
M14x2.0	48	11	3,4,5,6	

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 2. Metric Fine Threads

Nominal size	Threaded portion A (only indicative)	Shank ϕD	No. of flutes	Reference (LxRxH)
M4x0.5	12	3.3	3,4,5	Depends on Machine type. Please contact us about the details.
M5x0.5	12	4	3,4,5	
M6x0.75	18	5	3,4,5	
M7x0.75	18	6	3,4,5	
M8x1.0	24	6.4	3,4,5,6	
M8x0.75	18	7	3,4,5,6	
M9x1.0	24	7.5	3,4,5,6	
M9x0.75	18	8	3,4,5,6	
M10x1.25	30	8.2	3,4,5,6	
M10x1.0	24	8.5	3,4,5,6	
M10x0.75	18	9	3,4,5,6	
M11x1.0	24	9.5	3,4,5,6	
M11x0.75	18	10	3,4,5,6	
M12x1.5	36	9.5	3,4,5,6	
M12x1.25	30	10	3,4,5,6	
M12x1.0	24	10.5	3,4,5,6	

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 3. Unified Coarse Threads

Nominal size	Threaded portion A (only indicative)	Shank ϕD	No. of flutes	Reference (LxRxH)
No.6-32UNC	19	2.5	3	Depends on Machine type. Please contact us about the details.
No.8-32UNC	19	3	3	
No.10-24 UNC	25	3.5	3,4,5	
No.12-24 UNC	25	4	3,4,5	
1/4-20 UNC	30	4.5	3,4,5	
5/16-18UNC	34	6	3,4,5,6	
3/8-16UNC	38	7.3	3,4,5,6	
7/16-14UNC	44	8.5	3,4,5,6	
1/2-13UNC	47	10	3,4,5,6	
9/16-12UNC	51	11	3,4,5,6	

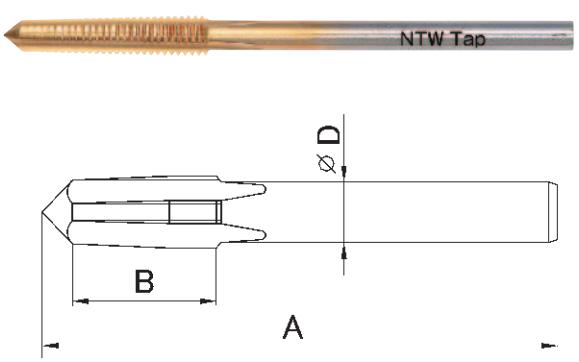
The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 4. Unified Fine Threads

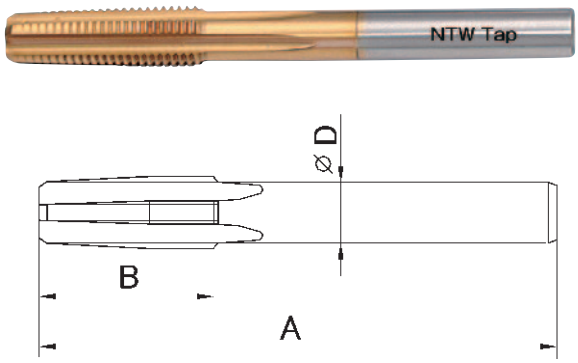
Nominal size	Threaded portion A (only indicative)	Shank ϕD	No. of flutes	Reference (LxRxH)
No.8-36UNF	17	3.3	3	Depends on Machine type. Please contact us about the details.
No.10-32UNF	19	3.8	3,4,5	
No.12-28UNF	22	4	3,4,5	
1/4-28UNF	22	5	3,4,5	
5/16-24UNF	25	6.4	3,4,5,6	
3/8-24UNF	25	8.2	3,4,5,6	
7/16-20UNF	30	9	3,4,5,6	
1/2-20UNF	30	10.5	3,4,5,6	

The above mentioned dimensions are examples only. Please tell us your exact requirements.

H Nib Taps



M6 · ¼ and smaller



M7 · 5/16 and larger

Table 1. Metric Coarse Threads

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
M4x0.7	60	17	3	3
M4.5x0.75	60	18	3.5	3
M5x0.8	65	19	3.8	3,4,5
M6x1.0	70	24	4.5	3,4,5
M7x1.0	70	24	5.5	3,4,5
M8x1.25	77	30	6.05	3,4,5,6
M9x1.25	77	30	7.1	3,4,5,6
M10x1.5	89	36	7.8	3,4,5,6
M11x1.5	89	36	8.8	3,4,5,6
M12x1.75	102	42	9.5	3,4,5,6
M14x2.0	114	48	11.2	3,4,5,6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 2. Metric Fine Threads

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
M4x0.5	60	12	3.3	3
M5x0.5	65	12	4	3,4,5
M6x0.75	70	18	5	3,4,5
M7x0.75	70	18	6	3,4,5
M8x1.0	77	24	6.4	3,4,5,6
M8x0.75	77	18	7	3,4,5,6

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
M9x1.0	77	24	7.5	3,4,5,6
M9x0.75	77	18	8	3,4,5,6
M10x1.25	89	30	8.2	3,4,5,6
M10x1.0	89	24	8.5	3,4,5,6
M10x0.75	89	18	9	3,4,5,6
M11x1.0	89	24	9.5	3,4,5,6
M11x0.75	89	18	10	3,4,5,6
M12x1.5	102	36	9.5	3,4,5,6
M12x1.25	102	30	10	3,4,5,6
M12x1.0	102	24	10.5	3,4,5,6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 3. Unified Coarse Threads

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
No.6-32UNC	60	19	2.4	3
No.8-32UNC	60	19	3.1	3
No.10-24UNC	70	25	3.4	3,4,5
No.12-24UNC	70	25	4	3,4,5
1/4-20UNC	70	30	4.5	3,4,5
5/16-18UNC	77	34	6	3,4,5,6
3/8-16UNC	89	38	7.3	3,4,5,6
7/16-14UNC	102	44	8.6	3,4,5,6
1/2-13UNC	102	47	10	3,4,5,6
9/16-12UNC	114	51	11	3,4,5,6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

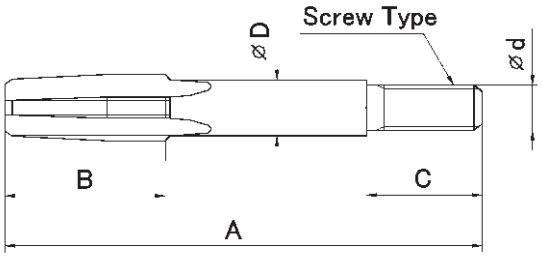
Table 4. Unified Fine Threads

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
No.8-36UNF	60	17	3.3	3
No.10-32UNF	70	19	3.8	3,4,5
No.12-28UNF	70	22	4	3,4,5
1/4-28UNF	70	22	5	3,4,5

Nominal size	Length A	Threaded portion B (Only indicative)	Shank ϕD	No. of flutes
5/16-24UNF	77	25	6.4	3,4,5,6
3/8-24UNF	89	25	8.2	3,4,5,6
7/16-20UNF	102	30	9	3,4,5,6
1/2-20UNF	102	30	10.5	3,4,5,6

The above mentioned dimensions are indicative only. Please tell us your exact requirements.
We make also other sizes and types. Please feel free, ask us.

NTW Screw Type and Torsert Type Nib Taps



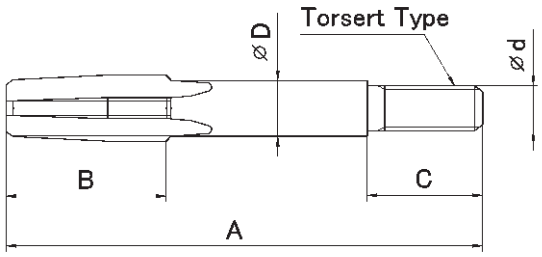


Table 1. Metric Coarse Threads

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
M8x1.25	80		30		6.4	20	M5.3x0.8
M10x1.5	90		36		8	20	M6.5x1
M12x1.75	105		42		9.8	25	M8.5x1.25
M14x2.0	110	130	48	60	11.5	30	9
M16x2.0	120	140	48	60	13.5	30	10
M18x2.5	130	150	60	75	14.5	30	11
M20x2.5	130	150	60	75	16.5	30	12
M22x2.5	140	165	60	75	18.5	35	14
M24x3.0	150	180	72	90	20	40	15
M27x3.0	160	180	72	90	23	45	18
M30x3.5	180	200	84	105	25.5	45	20
M33x3.5		200		105	28.5	45	M22x2
M36x4.0		220		125	30.5	45	M24x2
M39x4.0		220		125	33.5	45	M26x2
M42x4.5		230		135	36	45	M27x1.5
M45x4.5		230		135	39	45	M30x1.5
M48x5.0		250		150	41.5	50	M33x1.5
M52x5.0		250		150	45.5	50	M36x2

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
M56x5.5		270		165	49	55	M39x2
M60x5.5		270		165	53	55	M42x2
M64x6.0		300		180	56.5	60	M45x2

*1 Other lengths available by order.
*2 The shanks for torsert nib taps are used with helical coil. The coil acts as breakage prevention device if torque becomes too high. The torsert type is employed with the sizes of M14 — M30. Screw type nib taps do not use helical coil.

Table 2. Metric Fine Threads

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
M10x1.25	90		30		8.2	20	M6.5x1
M10x1.0	90		24		8.5	20	M6.5x1
M12x1.5	105		36		10	25	M8.5x1.25
M12x1.25	105		30		10	25	M8.5x1.25
M14x1.5	110	130	36	55	12	30	9
M14x1.0	110	130	24	45	12	30	9
M15x1.5	120	130	36	55	13	30	10
M15x1.0	120	130	24	45	13	30	10
M16x1.5	120	130	36	60	14	30	10
M16x1.0	120	130	24	45	14	30	10
M17x1.5	120	130	36	60	15	30	11
M17x1.0	120	130	24	45	15	30	11
M18x2.0	130	150	48	70	15	30	11
M18x1.5	130	140	36	65	15.5	30	12
M18x1.0	120	130	24	45	16	30	12
M20x2.0	130	150	48	70	17	30	12
M20x1.5	130	140	36	65	17.5	30	12
M20x1.0	120	130	24	50	18	30	12
M22x2.0	130	150	48	75	19	35	14
M22x1.5	130	150	36	70	19.5	35	14
M22x1.0	120	130	24	50	20	35	14
M24x2.0	130	150	48	75	21	40	16
M24x1.5	130	150	36	70	21.5	40	16
M24x1.0	120	130	24	50	22	40	16

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
M25x2.0		150		75	22	40	16
M25x1.5		150		70	22.5	40	16
M25x1.0		140		50	23	40	16
M26x1.5		150		70	23.5	40	16
M27x2.0		160		80	24	40	18
M27x1.5		160		75	24.5	40	18
M27x1.0		140		50	25	40	18
M28x2.0		160		80	25	40	18
M28x1.5		160		75	25.5	40	18
M28x1.0		140		50	26	40	18
M30x3.0		200		100	26	45	20
M30x2.0		160		80	27	40	20
M30x1.5		160		75	27.5	40	20
M30x1.0		140		50	28	40	20
M32x2.0		170		85	29	40	M22x2
M32x1.5		160		75	29.5	40	M22x2
M33x3.0		200		100	29	45	M22x2
M33x2.0		170		85	30	40	M22x2
M33x1.5		160		75	30.5	40	M22x2
M35x1.5		160		75	32.5	40	M24x2
M36x3.0		200		105	32	45	M24x2
M36x2.0		180		90	33	40	M24x2
M36x1.5		160		75	33.5	40	M24x2
M38x1.5		160		75	35.5	40	M27x1.5
M39x3.0		200		105	34.5	45	M26x2
M39x2.0		180		90	36	40	M27x1.5
M39x1.5		160		75	36.5	40	M27x1.5
M40x1.5		160		75	37.5	40	M27x1.5
M42x3.0		200		105	37.5	45	M27x1.5
M42x1.5		160		75	39.5	40	M30x1.5

＊1 Other lengths available by order.

＊2 The shanks for torsert nib taps are used with helical coil. The coil acts as breakage prevention device if torque becomes too high. The torsert type is employed with the sizes of M14 — M30. Screw type nib taps do not use helical coil.

Table 3. Unified Coarse Threads

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
7/16-14UNC	95		44		8.7	20	M7.4x1
1/2-13UNC	105		47		10	25	M8.5x1.25
9/16-12UNC	110	130	51		11.5	30	9
5/8-11UNC	120	140	55	70	13	30	10
3/4-10UNC	130	150	60	75	15.5	30	12
7/8-9UNC	140	165	68	85	18.5	35	14
1 – 8UNC	150	180	76	95	21	40	16
1.1/8-7UNC		200		110	24	45	18
1.1/4-7UNC		200		110	27	45	20
1.3/8-6UNC		220		125	29.5	45	M22x2
1.1/2-6UNC		220		125	32.5	45	M24x2
1.3/4-5UNC		250		155	37.5	50	M30x1.5
2-4.1/2UNC		270		170	43.5	50	M35x1.5

＊1 Other lengths available by order.
＊2 The shanks for torsert nib taps are used with helical coil. The coil acts as breakage prevention device if torque becomes too high. The torsert type is employed with the sizes of 9/16-12UNC — 1.1/4-7UNC. Screw type nib taps do not use helical coil.

Table 4. Unified Fine Threads

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
7/16-20UNF	95		30		9.5	25	M8.5x1.25
1/2-20UNF	105		30		10.5	25	M8.5x1.25
9/16-18UNF	110	130	35	50	12	30	9
5/8-18UNF	120	130	35	55	14	30	10
3/4-16UNF	120	130	38	60	16.5	30	12
7/8-14UNF	130	150	45	75	19.5	35	14
1-12UNF	140	160	50	80	22.5	40	16
1.1/8-12UNF		170		85	25.5	40	18
1.1/4-12UNF		170		85	28.5	40	20
1.3/8-12UNF		180		90	31.5	45	M24X2
1.1/2-12UNF		180		90	35	45	M26X2

＊1 Other lengths available by order.
＊2 The shanks for torsert nib taps are used with helical coil. The coil acts as breakage prevention device if torque becomes too high. The torsert type is employed with the sizes of 9/16-18UNF — 1.1/4-12UNF. Screw type nib taps do not use helical coil.

Table 5. Unified Threads

Nominal size	Length A*1		Threaded portion B (Only indicative)		Shank ϕD	Connecting part	
	H	N				C	ϕd or size*2
1.1/8-8UN		200		100	24.5	45	18
1.1/4-8UN		200		100	27.5	45	20
1.3/8-8UN		200		105	30.5	45	M22X2
1.1/2-8UN		200		105	33.5	45	M24X2
1.5/8-8UN		200		105	36.5	45	M27X1.5
1.3/4-8UN		200		105	40	45	M30X1.5
1.7/8-8UN		200		110	43	45	M33X1.5
2-8UN		200		110	46	45	M35X1.5
1-14UN	140	160	45	75	22.5	40	16
1.1/8-16UN	130	160	38	75	26	40	18

＊1 Other lengths available by order.
＊2 The shanks for torsert nib taps are used with helical coil. The coil acts as breakage prevention device if torque becomes too high. The torsert type is employed with the sizes of 1.1/8-8UN, 1.1/4-8UN, 1-14UN and 1.1/8-16UN. Screw type nib taps do not use helical coil.

Nut Taps

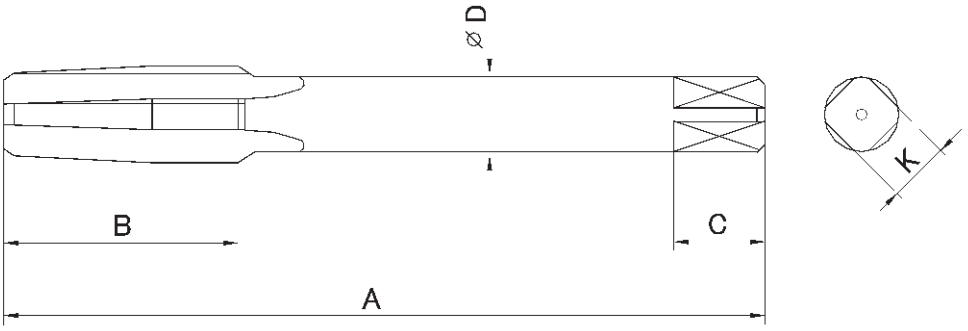


Table 1. Metric Coarse Threads

Nominal size	Length A		Threaded portion B	Shank ϕD	Square part		No. of flutes
	N-type	L-type			K	C	
M7x1.0	130		35	5.5	4.5	8	3
M8x1.25	140		40	6.2	5	10	3
M9x1.25	150		45	7.2	5.5	10	3
M10x1.5	155		50	7.8	6	11	3
M11x1.5	160		50	8.5	6.5	12	3
M12x1.75	170		60	9	7	12	3
M14x2.0	170		65	11	9	13	3
M16x2.0	180	200	70	13	10	14	3
M18x2.5	200	220	80	14	11	14	3
M20x2.5	200	240	85	16	12	15	3
M22x2.5	210	250	90	18	14	17	3
M24x3.0	220	260	100	19	15	18	3
M27x3.0	220	280	105	22	17	20	3
M30x3.5	230	300	120	24	19	22	3
M33x3.5	240	310	125	26	21	24	3
M36x4.0	250	320	135	28	21	24	4
M39x4.0	260	330	140	31	23	26	4
M42x4.5	280	340	155	33	26	30	4
M45x4.5	290	355	160	36	29	32	4
M48x5.0	310	370	170	39	29	32	4

Nominal size	Length A		Threaded portion B	Shank ϕD	Square part		No. of flutes
	N-type	L-type			K	C	
M52x5.0	320		180	42	32	35	4
M56x5.5	340		190	44	35	38	4
M60x5.5	350		200	46	35	38	4
M64x6.0	370		210	48	38	42	6
M68x6.0	380		220	50	38	42	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 2. Metric Fine Threads

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M7x0.75	130	35	5.5	4.5	8	3
M8x1.0	140	40	6.2	5	10	3
M8x0.75	140	35	6.2	5	10	3
M9x1.0	150	40	7.3	5.5	11	3
M9x0.75	150	35	7.3	5.5	11	3
M10x1.25	155	45	7.8	6	12	3
M10x1.0	155	40	7.8	6	12	3
M10x0.75	155	35	7.8	6	12	3
M11x1.0	160	45	8.5	6.5	12	3
M11x0.75	160	40	8.5	6.5	12	3
M12x1.5	170	55	9.5	7	12	3
M12x1.25	170	50	9.5	7	12	3
M12x1.0	170	45	9.5	7	12	3
M14x1.5	170	60	11.5	9	13	3
M14x1.0	170	50	11.5	9	13	3
M15x1.5	180	65	12	9	13	3
M15x1.0	180	50	12	9	13	3
M16x1.5	180	65	13	10	14	3
M16x1.0	180	50	13	10	14	3
M17x1.5	180	65	13.5	10	14	3
M17x1.0	180	50	13.5	10	14	3
M18x2.0	200	75	14	11	14	3
M18x1.5	180	65	14	11	14	3

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M18x1.0	180	55	14	11	14	3
M20x2.0	200	80	16	12	15	3
M20x1.5	190	70	16	12	15	3
M20x1.0	180	55	16	12	15	3
M22x2.0	200	80	18	14	17	3
M22x1.5	200	70	18	14	17	3
M22x1.0	190	60	18	14	17	3
M24x2.0	210	85	19	15	18	3
M24x1.5	210	75	19	15	18	3
M24x1.0	190	60	19	15	18	3
M25x2.0	210	85	20	15	18	3
M25x1.5	210	75	20	15	18	3
M25x1.0	190	60	20	15	18	3
M26x1.5	210	75	21	17	20	3
M27x2.0	210	85	22	17	20	3
M27x1.5	210	75	22	17	20	3
M27x1.0	190	65	22	17	20	3,4
M28x2.0	210	85	22	17	20	3
M28x1.5	210	75	22	17	20	3
M28x1.0	190	65	22	17	20	3,4
M30x3.0	230	110	24	19	22	3
M30x2.0	210	90	24	19	22	3
M30x1.5	210	80	24	19	22	3
M30x1.0	200	70	24	19	22	4
M32x2.0	210	90	24	19	22	3
M32x1.5	210	80	24	19	22	3
M33x3.0	230	115	26	21	24	3
M33x2.0	210	90	24	19	22	3
M33x1.5	210	80	24	19	22	4
M36x3.0	240	120	28	21	24	4
M36x2.0	220	95	26	21	24	4
M36x1.5	210	85	26	21	24	4
M38x1.5	210	85	26	21	24	4

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M39x3.0	240	120	30	23	26	4
M39x2.0	220	95	26	21	24	4
M39x1.5	210	85	26	21	24	4
M40x3.0	240	120	30	23	26	4
M40x2.0	220	95	26	21	24	4
M40x1.5	210	85	26	21	24	4
M42x4.0	280	140	33	26	30	4
M42x3.0	250	125	31	23	26	4
M42x2.0	230	100	28	21	24	4
M42x1.5	210	90	28	21	24	4
M45x4.0	280	145	36	29	32	4
M45x3.0	250	125	31	23	26	4
M45x2.0	230	100	28	21	24	4
M45x1.5	210	90	28	21	24	4
M48x4.0	290	150	39	29	32	4
M48x3.0	260	130	35	26	30	4
M48x2.0	240	105	31	23	26	4
M48x1.5	220	95	28	21	24	4
M50x3.0	260	130	35	26	30	4
M50x2.0	240	105	31	23	26	4,6
M50x1.5	220	95	28	21	24	6
M52x4.0	290	150	42	32	35	4
M52x3.0	270	140	35	26	30	4
M52x2.0	240	105	31	23	26	6
M52x1.5	220	95	28	21	24	6
M55x4.0	300	155	42	32	35	4
M55x3.0	270	140	38	29	32	4
M55x2.0	240	110	31	23	26	6
M55x1.5	220	95	28	21	24	6
M56x4.0	310	155	42	32	35	4
M56x3.0	280	140	38	29	32	4
M56x2.0	250	110	33	26	30	6
M56x1.5	230	100	30	23	26	6

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M58x4.0	310	155	42	32	35	4
M58x3.0	280	140	38	29	32	4
M58x2.0	250	110	33	26	30	6
M58x1.5	230	100	30	23	26	6
M60x4.0	310	160	42	32	35	4
M60x3.0	280	140	38	29	32	4
M60x2.0	250	115	33	26	30	6
M60x1.5	230	100	30	23	26	6
M62x4.0	310	160	42	32	35	4
M62x3.0	280	140	38	29	32	4
M62x2.0	250	115	33	26	30	6
M62x1.5	230	100	30	23	26	6
M64x4.0	320	165	45	35	38	4
M64x3.0	280	140	40	32	35	4
M64x2.0	260	120	35	26	30	6
M64x1.5	240	105	30	23	26	6
M65x4.0	320	165	45	35	38	4
M65x3.0	280	140	40	32	35	4
M65x2.0	260	120	35	26	30	6
M65x1.5	240	105	30	23	26	6
M68x4.0	320	165	45	35	38	6
M68x3.0	280	140	40	32	35	6
M68x2.0	260	120	38	29	32	6
M68x1.5	240	105	33	26	30	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 3. Metric Fine Threads (6 pitch)

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M70x6.0	380	220	50	38	42	6
M72x6.0	390	230	50	38	42	6
M76x6.0	390	230	50	38	42	6
M80x6.0	400	240	54	41	44	6

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M85x6.0	400	240	54	41	44	6
M90x6.0	400	250	60	46	50	6
M95x6.0	400	250	60	46	50	6
M100x6.0	410	260	65	50	52	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 4. Metric Fine Threads (4 Pitch)

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M70x4.0	320	170	45	35	38	6
M72x4.0	320	170	45	35	38	6
M75x4.0	330	175	45	35	38	6
M76x4.0	330	175	45	35	38	6
M80x4.0	330	180	49	38	42	6
M85x4.0	340	190	49	38	42	6
M90x4.0	350	200	55	41	44	6
M95x4.0	350	200	55	41	44	6
M100x4.0	360	210	60	46	50	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 5. Metric Fine Threads (3 Pitch)

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M70x3.0	290	150	42	32	35	6
M72x3.0	290	150	42	32	35	6
M75x3.0	290	150	45	35	38	6
M76x3.0	290	150	45	35	38	6
M80x3.0	310	160	49	38	42	6
M85x3.0	310	160	49	38	42	6
M90x3.0	310	160	53	41	44	6
M95x3.0	320	170	53	41	44	6
M100x3.0	320	170	58	46	50	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 6. Metric Fine Threads (2 Pitch)

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
M70x2.0	260	120	38	29	32	6
M72x2.0	260	120	38	29	32	6
M75x2.0	270	130	40	32	35	6
M76x2.0	270	130	40	32	35	6
M78x2.0	270	130	40	32	35	6
M80x2.0	270	130	40	32	35	6
M82x2.0	280	140	45	35	38	6
M85x2.0	280	140	45	35	38	6
M90x2.0	300	140	50	38	45	6

The above mentioned dimensions are examples only. When placing an order, please specify each dimension.

Table 7. Unified Coarse Threads

Nominal size	Length A		Threaded portion B	Shank ϕD	Square part		No. of flutes
	N-type	L-type			K	C	
5/16-18UNC	140		45	6	4.5	8	3
3/8-16UNC	155		50	7.3	5.5	10	3
7/16-14UNC	160		55	8.5	6.5	12	3
1/2-13UNC	170		60	9.5	7	12	3
9/16-12UNC	170		65	11	9	13	3
5/8-11UNC	180	200	70	12.5	10	14	3
3/4-10UNC	200	230	80	15	12	15	3
7/8-9UNC	210	250	90	18	14	17	3
1-8UNC	220	270	100	20.5	17	20	3
1.1/8-7UNC	220	290	115	23	17	20	3
1.1/4-7UNC	230	300	120	26	21	24	3
1.3/8-6UNC	250	320	135	28	21	24	4
1.1/2-6UNC	260	330	140	31	23	26	4
1.3/4-5UNC	300		170	36	29	32	4
2-4.1/2UNC	330		190	42	32	35	4
2.1/4-4.1/2-UNC	340		200	46	35	38	4
2.1/2-4UNC	360		215	48	38	42	4
2.3/4-4UNC	380		220	55	41	44	4,6

Nominal size	Length A		Threaded portion B	Shank ϕD	Square part		No. of flutes
	N-type	L-type			K	C	
3-4UNC	390		230	58	46	50	6

The above mentioned dimensions are examples only. Please tell us your exact requirements.

Table 8. Unified Fine Threads

Nominal size	Length A	Threaded portion B	Shank ϕD	Square part		No. of flutes
				K	C	
5/16-24UNF	140	40	6	4.5	8	3
3/8-24UNF	155	45	7.3	5.5	10	3
7/16-20UNF	160	50	8.5	6.5	12	3
1/2-20UNF	170	55	9.5	7	12	3
9/16-18UNF	170	60	11.5	9	13	3
5/8-18UNF	180	65	13	10	14	3
3/4-16UNF	190	70	15	12	15	3
7/8-14UNF	200	80	18	14	17	3
1-12UNF	210	85	21	17	20	3
1.1/8-12UNF	210	85	23	17	20	3
1.1/4-12UNF	210	90	25	19	22	3
1.3/8-12UNF	220	95	28	21	24	4
1.1/2-12UNF	220	95	28	21	24	4

The above mentioned dimensions are examples only. When placing an order, please specify each dimension.

Other Tap Types

We also make the following tap types.

- Hand taps (short machine taps)

- Spiral pointed hand taps

- Spiral fluted hand taps

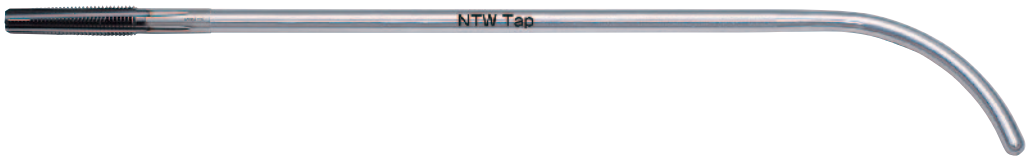
- Spiral fluted taps (with a bent shank)

- Spiral pointed taps

- Thread forming taps (fluteless taps)

- Thread forming taps with a pilot guide bush (with a bent shank)

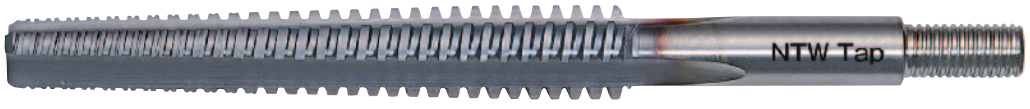
- Pilot guide taps (with a bent shank)



- The taps with a pilot guide bush

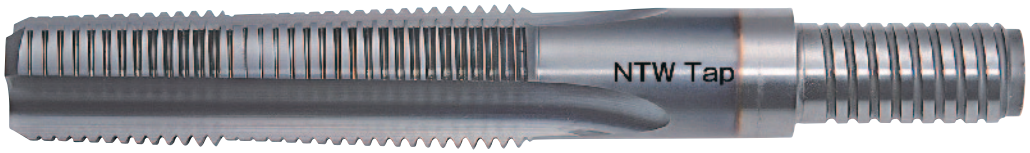
- Type R nib taps (solder type)

- Trapezoidal thread taps



- Pipe taps

- Tandem taps



- Multiple thread taps

- Reamers

The above taps are only samples of our taps. If you do not find a suitable tap type, please feel free to contact us.

Other thread types

Besides, metric threads and unified threads, we also make taps for other threads such as British Standard Whitworth, Taper Pipe Threads, and Cycle threads. Please contact us about the specifications.

Technical information

Surface Treatment of Taps

Various kinds of surface treatments are invented to prevent wear and galling on taps.

Types*	Effects	Maximum Temperature used	Hardness
Steam oxide treatment (HOMO)	Prevention of galling by means of porous oxide film	550° C	Hardness of base material
Nitride treatment (NH)	Improved wear resistance and galling-proofness by means of diffusing layer of nitride	550° C	HV 1100
Nitride & Steam oxide (NHH)	Improved wear resistance and galling-proofness	550° C	HV1100
Titanium Nitride (TiN)	Improved wear resistance and galling-proofness	600° C	HV 2300
Titanium Carbonitride (TiCN)	Improved wear resistance and galling-proofness	450° C	HV 3000

*Other treatments are also available. Please feel free to consult us.

How to choose right surface treatment

Surface treatment is selected based on nut material. Nut material and tap hardness should be good match. If a tap is too hard, it may easily break or it cuts too deeply, thus, causing NO-GO Gage troubles. If the tap is too soft, tap life becomes short.

Terms of taps for tapping nuts

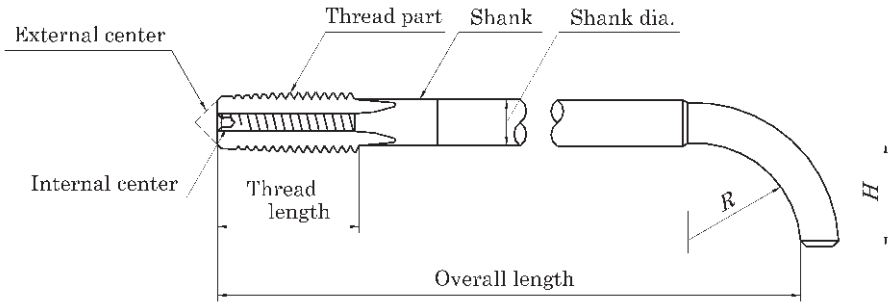


Fig. 1. Bent Shank Tap type

Chamfer : The tapering of the threads at the front end of each land by cutting away and relieving the crest to distribute the cutting action over several teeth. Chamfer Length of a bent shank tap is from usual 60 to 80 percent of the thread length.

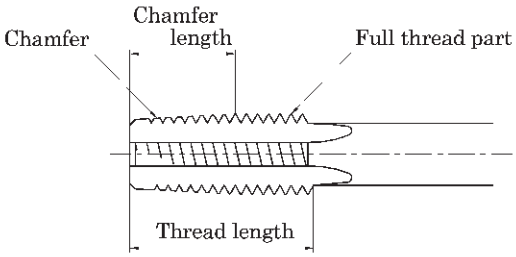


Fig.2. Chamfer

Chamfer Angle is formed between the chamfer and axis of the tap measured in an axial plane at the cutting edge. The point diameter is designed to start cutting when a tap pass from 50 to 70 percent of the height of a nut.

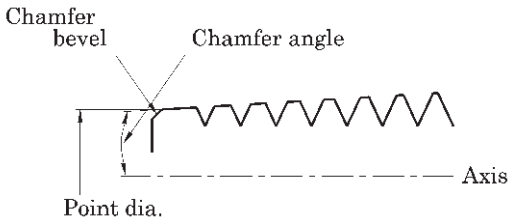


Fig. 3. Chamfer Angle

Chamfer Relief is the gradual decrease in land height from cutting edge to heel on the chamfered portion, to provide clearance for the cutting action as the tap advances.

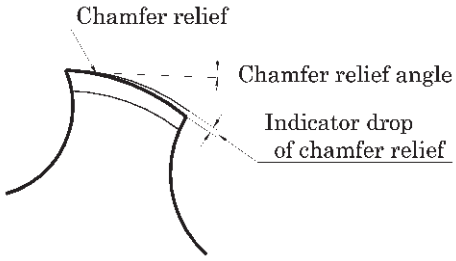


Fig. 4. Chamber relief

Chamfer Relief Angle is the complement of the angle formed between a tangent to the relieved surface at the cutting edge and a radial line to the same point on the cutting edge. (Please see Fig.5)

a) The angle usually ranges from 2° to 10° and it depends on cutting conditions.

b) If the angle is too big, the tap cuts very deeply, but the nut goes often through NO GO-Gage and the surface of a nut flank is chattering.

In contrast, in the case the angle is too small, the life span of the tap gets short because of abrasion and the surface of a nut flank is plucking off.

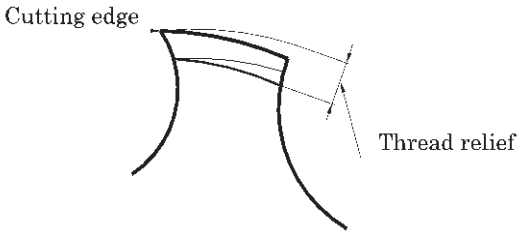


Fig. 5. Thread Relief

Thread Relief is the clearance produced by removal of metal from behind the cutting edge. When the thread angle is relieved, starting at the cutting edge and continuing to the heel, the tap is said to have “eccentric” relief.

Back Taper is a gradual decrease in the diameter of the thread form on a tap from the chamfered end of the land towards the back which creates a slight radial-relief in the threads.

Land is one of the thread sections between the flutes of a tap. The wide land gives a better influence to the thread accuracy of a nut than the narrow land. However, if the land is too wide, it will increase the cutting resistance and the chip flow is not good.

Flute is longitudinal channels formed in a tap to create cutting edge on the thread profile and provide space for chips and cutting oil to pass through.

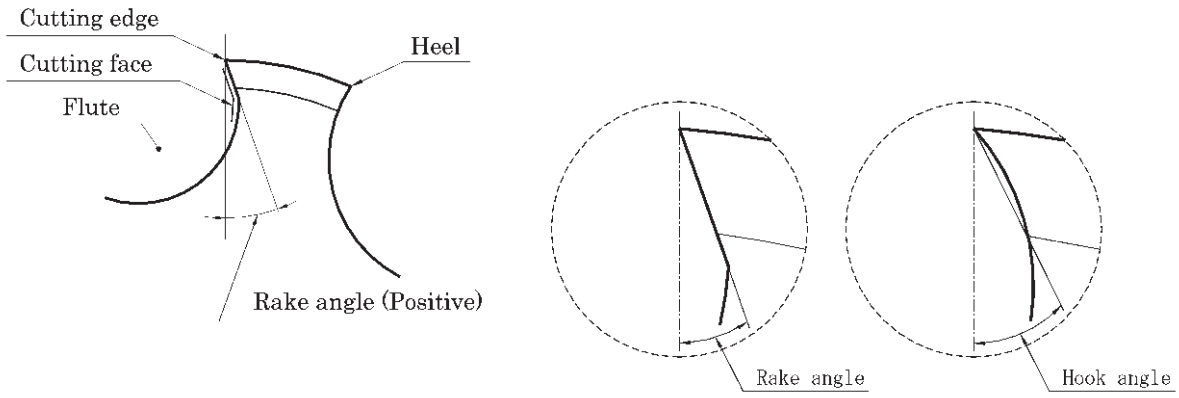


Fig. 6. Terms of cutting edge

Rake is angular relationship of the straight cutting face of a tooth with respect to a radial line through the crest of the tooth at the cutting edge. Rake is a general name for hook angle and rake angle. Positive rake means that the crest of the cutting face is angular a head of the balance of the cutting face of the tooth. Negative rake means that the crest of the cutting face is angularly behind the balance of the cutting face of the tooth. Zero rake means that the cutting face is directly on a radial line.

Hook angle is usually specified either chordal hook or tangential hook. Chordal hook angle means [*a concave face having an angle of inclination specified between a chord passing through the root and crest of a thread form at the cutting face, and a radial line through the crest at the cutting edge*]. Whereas, tangential hook angle means [*a concave face having an angle of inclination specified between a line tangent to the hook surface at the cutting edge and a radial line to the same point*].

The angle and the form of a flute have an influence on the form of chips, the sharp condition, the tool life and the surface of a nut flank. Hook angle is usually applied to low carbon steel nuts and rake angle to medium carbon steel nuts and the nut hardened by heat treatment.

Trouble shooting

While tapping nuts by bent shank taps, the following troubles are found frequently:

1. Accuracy of female threads
    a. Oversize pitch diameter (goes through NO-GO Gage)
    b. Undersize pitch diameter (does not go through GO Gage)
    c. Oversize minor diameter (goes through NO-GO Plain Gage)
    d. Over inclination bearing surface
2. Finished Surface of female threads
    a. Thorn or rough thread
    b. Chattering on tapped thread
3. Tap life
    a. Breakage
    b. Chipping
    c. Wear

These troubles are, theoretically, caused by incorrect tap and improper cutting conditions (nut material, cutting speed, cutting oil, tapping machine, etc.), but they are related each other in a complicated way and in some cases it is quite difficult to specify single or simple cause and to take effective counter-measures.

It is possible and recommended, however, to narrow the causes down by observing the following condition in detail:

(1) Condition of tap wear
(2) Change of tap color due to contact by nut blank or chips
(3) Condition of the hole before tapping (taper, hardened surface, scale, etc.)
(4) Inconsistent hardness of nut blanks
(5) Abnormal noise, vibration and heat
(6) Volume and cleanness of cutting oil and oil supply frequency

The following are examples of causes of troubles and countermeasures and can be utilized to shoot troubles:

Trouble Contents	Causes	Countermeasures
1.a) Oversize Pitch Dia. (goes through NO-GO Gage)	Incorrect pitch diameter of tap	Use correct pitch diameter tap. (Use smaller pitch diameter tap.)
	Run-out of tap shank axis	Correct bending and run-out of tap shank. / Use larger diameter shank. / Adjust clearance between the guide of the machine and a nut blank.
	Improper biting of tap	Enlarge rake angle of tap. / Increase indicator drop for chamfer relief. / Make the point diameter of chamfer to fit the inner hole of the nut. / Use a combined tap. / Increase the pressure of the pushrod of machine.
	Built-up edge and galling	Use coated tap. / Correct cutting speed (slow down). / Increase cutting oil volume. / Put addition agent into cutting oil. / Change the oil type / Improve the way of oil supply.
	Over cutting	Use tap with no thread relief. / Keep margin portion. / Decrease rake angle. / Decrease chamfer relief angle. / Decrease the pressure of pushrod of the machine.
	Wear of NO-GO Gage	Replace with a new gage.

Trouble Contents	Causes	Countermeasures
1.b) Undersize Pitch Diameter (do not go through GO Gage)	Incorrect pitch diameter	Use accurate tolerance pitch diameter. (Use larger pitch diameter tap.)
	Insufficient cutting	Increase rake angle and use better performance tap.
	Flaws and dents of nut thread	Eliminate incomplete threads on the side of the shank. / Increase the radius (R) of bent shank and decrease shank diameter to improve flow of tapped nuts through the shank. / Adjust the cycle of pushrod to rpm.
	Chips remaining	Use the tap which discharges chips well. / Increase cutting oil volume. / Increase oil supply pressure.
	The roundness of female threads is bad	Decrease chamfer relief angle of the tap.
	Too hard nut blanks	Use wear resistance taps. / Anneal nut blanks. / Employ suitable forming method to decrease work hardening of nut blanks. /Avoid irregular hardness from quenching.
	Tap wear	Use wear resistance taps. / Replace the tap earlier. / Regrind flutes of the tap. / Increase cutting oil volume. / Put addition agent into cutting oil. / Use different cutting oil.
	Dented GO Gage	Remove the dent. / Replace with a new gage.

Trouble Contents	Causes	Countermeasures
1.c) Oversize internal thread	Oversize of mouth taper of hole before tapping	Improve forming method of nut blanks. / Increase the chamfer angle of the tap.
	Improper biting	Increase the pressure of the pushrod of the tapping machine. / Increase rake angle. / Increase chamfer relief angle of the tap. / Align the point diameter of chamfer with the inner diameter of the nut. / Use combined taps. / Change the tap/ Regrind the flutes.
1.d) Minor diameter too small	Tap wear	Use wear resistant taps. / Change the tap more often. / Regrind the flutes. / Increase the amount of cutting oil. /put addition agent into oil. / Change the type of the oil.
	Poor performance of tap	Increase rake angle. / Increase chamfer relief angle of the tap. / Change the tap. / Regrind the flutes.
1.e) Large inclination of bearing surface	Improper adjustment of machine	Adjust guide, etc. of the machine to avoid inclination. / Adjust the width and thickness of the chute. / Revise or change the point diameter of pushrod.
	Cutting quality is poor	Use a pilot tap. / Make point diameter smaller.

Trouble Contents	Causes	Countermeasures
2.a) Thorn or Rough Thread	Poor cutting quality of tap	Increase of rake angle of the tap. / Increase chamfer relief angle. / Change the tap. / Regrind the flutes
	Galling	Use coated taps. / Apply suitable cutting speed (slow down). / Increase cutting oil volume. / Put addition agent in cutting oil. / Use different cutting oil. / Improve the way of cutting oil supply.
	Tap wear	Use wear resistance taps. / Replace a tap earlier. / Regrind tap flutes. / Increase cutting oil volume. / Put addition agent in cutting oil. / Use different cutting oil.
	Chip packing	Use tap flutes which are designed to cutting conditions given. / Reduce a number of flutes (especially for high nuts).
2.b) Chattering	Over cutting	Decrease rake angle or chamfer relief angle of the tap. / Use a tap with no thread relief. / Keep margin portion.
	Improper adjustment of machine	Improve stiffness of the machine. / Use a different machine.

Trouble Contents	Causes	Countermeasures
3.a) Chipping	Improper choice of tap	Use taps which suit cutting conditions.
	Galling	Use coated taps. /Apply proper cutting speed (slow down). / Increase cutting oil volume. /Put addition agent in cutting oil. / Improve cutting oil supply.
	Improper adjustment of machine	Avoid empty tapping. (Arrange consistent feeding from the chute.)
3.b) Breakage	Chip packing	Increase volume of the flutes. / Reduce the number of flutes. / Use spiral taps or similar taps that eject chips forward.
	Prepared hole (Inner thread) is small	If possible, make the hole (of inner thread) bigger.
	Improper adjustments of machine	Avoid tapping two pcs at the same time.
3.c) Wear	Improper choice of a tap	Use the taps which suit materials, surface treatments and other cutting conditions.
	Nut blanks are too hard	Use wear resistance taps. / Anneal nut blanks. / Examine suitable forming method to decrease hardening of nut blanks. / Avoid irregularity of hardness from quenching.
	A scale on the hole of nut blank (hot forging).	Remove a scale by shot blasting before tapping.
	Heat	Increase cutting oil volume. / Put addition agent in cutting oil. / Use different cutting oil. / Improve cutting oil supply method.
	Improper adjustment of machine	Avoid empty tapping of the guide by preventing hitting the pushrod.

Thank you for your interest in our company

Please feel free to ask for more information or a quotation

Nomura Tool Works Co., Ltd.

Sales Office:

4-2-3, Saikujyo-cho, Nara, 630-8453, Japan

Tel: +81-742-64-3119 Fax: +81-742-64-3109

Head Office:

113, Misasagi-cho, Nara, 631-0803, Japan

Tel +81-742-33-3281 Fax +81-742-34-3528

Kitanosho Factory:

2-2-5, Kitanosho Nishimachi, Nara, 630-8452, Japan

Tel +81-742-63-0501 Fax +81-742-61-9123

E-mail: export@nomuratool.co.jp

www.nomuraltool.co.jp

BENT SHANK&NUT TAPS

NOMURA TOOL WORKS CO., LTD.