

Recoil® STI Taps

Recoil Insert Taps

Recoil taps differ from standard taps dimensionally and only Recoil Screw Thread Insert (STI) Taps are suitable for use with Recoil Wire Thread Inserts. Recoil taps are manufactured to precise standards from either High Speed Steel (HSS) with ground threads and are available with taper, intermediate, and bottoming leads. They have a larger diameter but the same pitch as a standard tap in order to accommodate the wire insert. Spiral point and spiral flute machine taps are also available for volume production purposes. For all sparkplug applications, pilot nose taps are recommended and are available for common metric thread sizes. The Recoil thread insert when installed into a correctly tapped hole will provide the applicable internal thread tolerance for the installed bolt.

Note: Tapped hole size can be significantly affected by variations in drill size, parent material, or lubricant so in close tolerance applications some testing for an optimum combination is recommended.

Metric thread tolerance equivalents standards		
	Standards	Recoil Standards
Medium	Metric 6H	5H
Close	Metric 5H	4H5H

Tap Type and Applications

The most commonly used type of Recoil taps are defined together with their typical applications. The Taper, Intermediate, and Bottoming are short machine taps (suitable for hand tapping), while the Spiral Point and Spiral Flute are used in production applications.

Surface Coatings

Recoil taps can be supplied in different surface coatings for special order requirements. Benefits of surface coatings include:

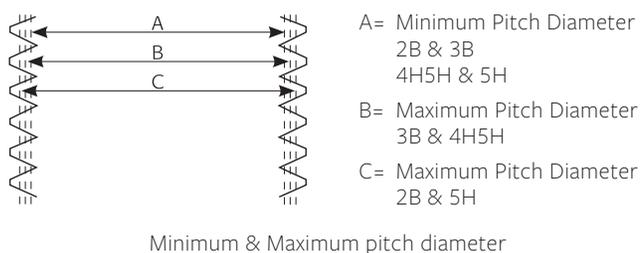
- Longer tool life
- Increased productivity
- Tools can be run at higher feeds and speeds
- Lower maintenance costs

Unified Thread Class

In the unified thread system, the minimum pitch diameter for a 2B hole (medium fit) or 3B hole (close fit) are the same, while the maximum pitch diameter is greater on the 2B hole (medium fit). Recoil taps for unified threads are made to a 3B hole (close fit) tolerance.

Metric Thread Class

In the metric thread system the minimum pitch diameter for a 5H hole (medium fit) or 4H5H hole (close fit) are the same, while the maximum pitch diameter is greater on the 5H hole (medium fit). Recoil taps for metric threads are made to 4H5H hole (close fit) tolerance.



Titanium Carbonitride - TiCNite (TiCN)

TiCNite coated taps have a very high surface hardness and are generally tougher than other coating materials. It has a high resistance to edge chipping.

Titanium Nitride - TiNite (TiN)

TiNite coating is a good choice for protecting the tap. It can achieve a longer life than uncoated taps and can be used at higher speeds.

Chromium Nitride (CrN)

This PVD coating was developed for use in non-ferrous areas where titanium based coatings were not successful. It is recommended for the machining and forming of titanium and copper and is harder than conventional chrome plating. The PVD coating process has no environmental side effects.

Recoil® STI Taps

Taper

Taper (or Roughing Taps) are used for starting precision and difficult holes. This tap has a lead of eight threads, but no size reduction.



Intermediate

Intermediate (or Plug/Second), used in most general purpose applications to facilitate thread cutting true to the drilled hole. The tap has a lead of four threads, but no size reduction.



Bottoming

Bottoming Taps are used to ensure the minimum thread run-out when tapping to the bottom of blind holes. The tap has a lead of two threads and would normally be preceded by a taper or an intermediate tap.



Pilot Nose

Pilot nose taps have been developed for repairing damaged threads without the need for drilling prior to tapping. This style of tap allows the use of the existing thread as a guide in tapping a straight hole. This style of tap is widely used in repairing damaged spark plug threads.



Spiral Flute

Spiral Flute taps are recommended for machine tapping for all blind hole applications, particularly in soft materials such as copper, magnesium and aluminium which produce long stringy swarf.



Spiral Point

Spiral Point Taps are recommended for machine tapping through holes. These taps provide for chip clearance within the lead of the tap.



Thredflo 'Roll Thread' Taps

These taps are designed for machine tapping in ductile materials with higher elasticity e.g. materials with a low silicon content, aluminium and some stainless steels. This tap is designed without flutes or cutting faces, but with special roll forming lobes. It has short tapered leads for through or blind holes and is made from HSS.

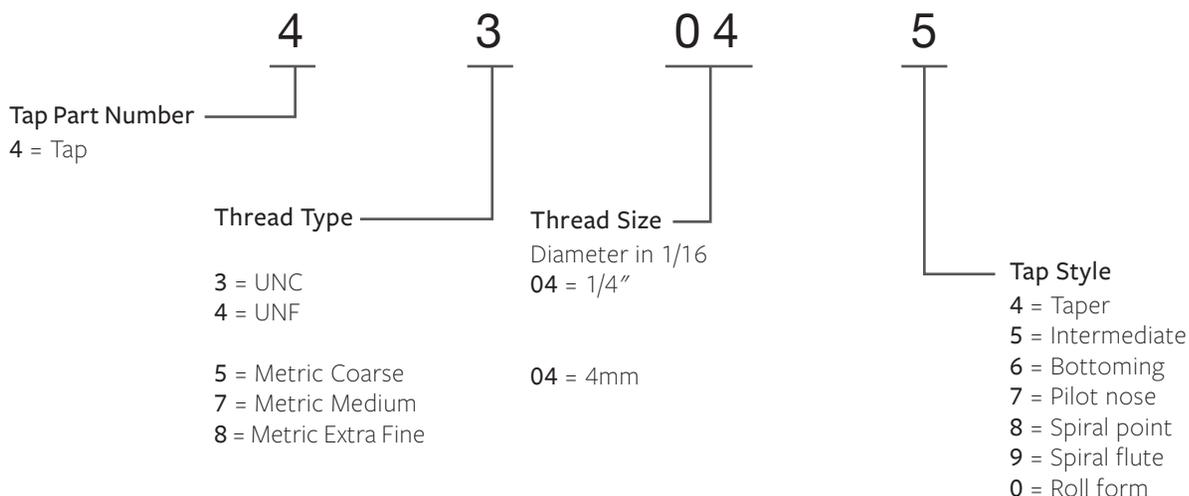


Recoil® STI Taps

Recoil Tap Part Numbering System

The system of identification used for Recoil taps is categorized into two primary sections: Inch threads and Metric threads.

The tap annotation for both thread designations is very similar and therefore easy to follow.

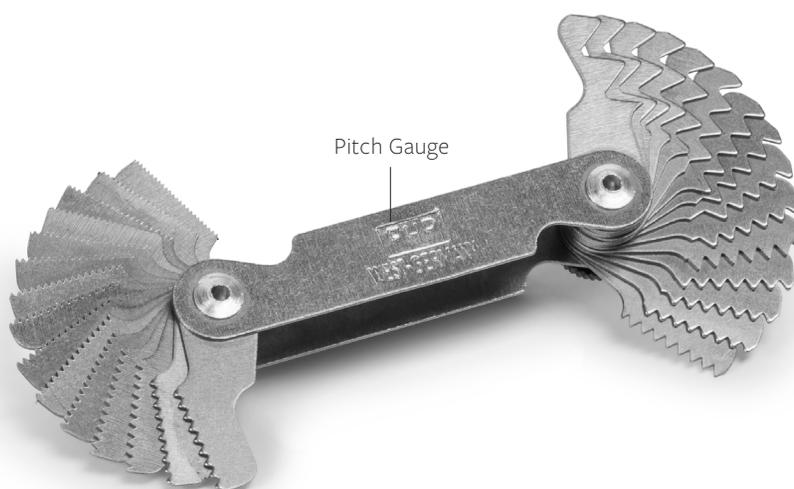


Example: 43045 = 1/4-20 UNC Intermediate Tap

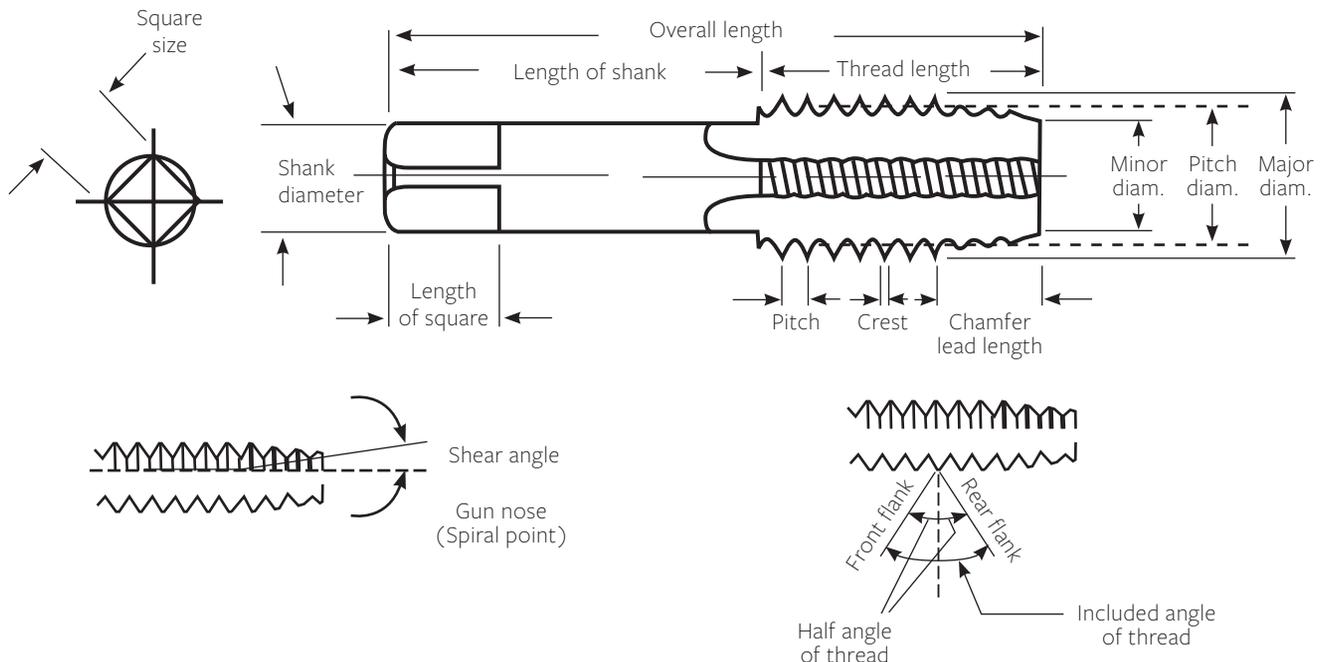
Screw Pitch Gauge

It is critical that inserts match the tapped hole exactly as some inch and metric are very close but only one is exactly right. A screw pitch gauge is the perfect tool to identify exact TPI or pitch. The bolt diameter should be measured and matched

to the closest size over, relating to the TPI or pitch of the thread. In general, major diameter of bolt or male thread will always be slightly less than the exact diameter listed in the thread identification and drill chart.



Tap Terminology



Actual Size

An actual size is a measured size.

Allowance

An allowance is the prescribed difference between the design (maximum material) size and the basic size. It is numerically equal to the absolute value of the ISO term fundamental deviation.

Angle of Thread

The included angle between the flanks of a thread measured in an axial plane.

Back Taper

A slight taper on the threaded portion of the tap making the pitch diameter near the shank smaller than that at the centre.

Basic

The theoretical or nominal standards size from which all variations are made.

Chamfer

The tapered and relieved cutting teeth at the front end of the threaded section. Common types of chamfer are taper, intermediate or bottoming.

Crest

The top joining the two sides or flanks of a thread.

Crest Clearance

The space between the crest of a thread and the root of its component.

Cutting Face

The leading face of the land.

Flank

The surface of the thread, sometimes referred to as the side of the thread which connects the crest with the root.

Flute

The longitudinal channels formed on a tap to create cutting edges on the thread profile.

Hand of Threads

- A Right Hand Thread is advanced by turning it to the right or clockwise
- A Left Hand Thread is advanced by turning it to the left or anti clock wise
- All left handed threads are designated LH

Heel

The following side of the land.

Height of the Thread

In profile, the distance between the crest and bottom section of the thread measured normal to the axis.

Helix Angle - Flute

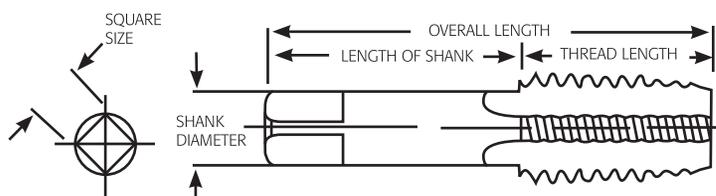
Flutes of taps are sometimes cut helically instead of straight. This helix angle is the angle made by the flute with the axis of the tap. (Helical Flutes are commonly referred to as spiral flutes.)

Recoil® STI Taps - Part Numbers and Dimensions

Thread Size	Taper	Intermediate	Bottoming	Spiral Point	Spiral Flute	Overall Length	Thread Length	Shank Diameter	Square Drive
Metric Coarse									
M2 - 0.4	45024	45025	45026	45028	45029	45	10	2.80	2.24
M2.2 - 0.45	45014	45015	45016	45018	45019	48	11	3.15	2.50
M2.5 - 0.45	45254	45255	45256	45258	45259	48	11	3.15	2.50
M3 - 0.5	45034	45035	45036	45038	45039	50	13	3.55	2.80
M3.5 - 0.6	45354	45355	45356	45358	45359	53	13	4.50	3.55
M4 - 0.7	45044	45045	45046	45048	45049	58	16	5.00	4.00
M5 - 0.8	45054	45055	45056	45058	45059	66	19	6.30	5.00
M6 - 1	45064	45065	45066	45068	45069	72	22	8.00	6.30
M7 - 1	45074	45075	45076	-	-	72	22	9.00	7.10
M8 - 1.25	45084	45085	45086	45088	45089	80	24	10.00	8.00
M9 - 1.25	45094	45095	45096	-	-	85	25	8.00	6.30
M10 - 1.5	45104	45105	45106	45108	45109	89	29	9.00	7.10
M11 - 1.5	45114	45115	45116	-	-	89	29	9.00	7.10
M12 - 1.75	45124	45125	45126	45128	45129	95	30	11.20	9.00
M14 - 2	45144	45145	45146	-	-	102	32	12.50	10.00
M15 - 2	45154	45155	45156	-	-	112	37	14.00	11.20
M16 - 2	45164	45165	45166	45168	45169	112	37	14.00	11.20
M18 - 2.5	45184	45185	45186	-	-	118	38	16.00	12.50
M20 - 2.5	45204	45205	45206	-	-	130	45	18.00	14.00
M22 - 2.5	45224	45225	45226	-	-	135	48	20.00	16.00
M24 - 3	45244	45245	45246	-	-	135	48	20.00	16.00
M27 - 3	45274	45275	45276	-	-	151	51	22.40	18.00
M30 - 3.5	45304	45305	45306	-	-	162	57	25.00	20.00
M30 - 3	45304-3	45305-3	45306-3	-	-	162	57	25.00	20.00
M33 - 3.5	45334	45335	45336	-	-	170	60	28.00	22.40
M36 - 4	45364	45365	45366	-	-	170	60	28.00	22.40
M39 - 4	45394	45395	45396	-	-	187	67	31.50	25.00
M42 - 4.5	45424	45425	45426	-	-	187	67	31.50	25.00
M42 - 4	45424-4	45425-4	45426-4	-	-	200	70	35.50	28.00
M52 - 5	45524	45525	45526	-	-	221	76	40.00	31.50

Note: The taps listed above represent the most popular of the Recoil taps available. Other sizes and types are available including BSW,BSF, NPT, BA, 8UN etc.

Tap dimensions based upon international (ISO) standard. Dimensions are reference only and may be changed without notice.



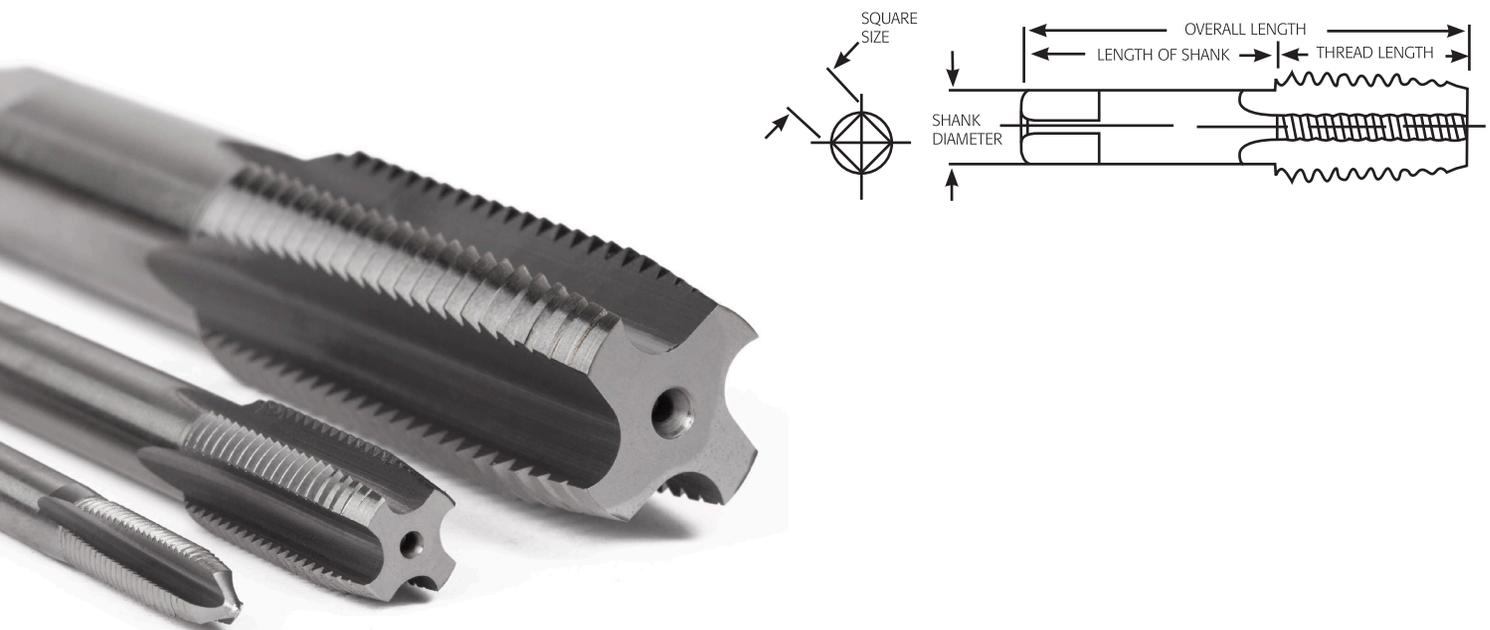


Recoil® STI Taps - Part Numbers and Dimensions

Thread Size	Taper	Intermediate	Bottoming	Spiral Point	Spiral Flute	Overall Length	Thread Length	Shank Diameter	Square Drive
Metric Fine									
M8 - 1	47084	47085	47086	-	-	80	24	10.00	8.00
M9 - 1	47094	47095	47096	-	-	85	25	8.00	6.30
M10 - 1.25	47104	47105	47106	47108	47109	85	25	8.00	6.30
M10 - 1	48104	48105	48106	48108	48109	85	25	8.00	6.30
M11 - 1.25	47114	47115	47116	-	-	89	29	9.00	7.10
M11 - 1	48114	48115	48116	-	-	89	29	9.00	7.10
M12 - 1.5	47124	47125	47126	-	-	95	30	11.20	9.00
M12 - 1.25	48124	48125	48126	-	-	95	30	11.20	9.00
M14 - 1.5	47144	47145	47146	-	-	102	32	12.50	10.00
M14 - 1.25	48144	48145	48146	-	-	102	32	12.50	10.00
M15 - 1.5	47154	47155	47156	-	-	112	37	14.00	11.20
M16 - 1.5	47164	47165	47166	-	-	112	37	14.00	11.20
M18 - 2	47184	47185	47186	-	-	112	37	14.00	11.20
M18 - 1.5	48184	48185	48186	-	-	112	37	14.00	11.20
M20 - 2	47204	47205	47206	-	-	118	38	16.00	12.50
M20 - 1.5	48204	48205	48206	-	-	118	38	16.00	12.50
M22 - 2	47224	47225	47226	-	-	130	45	18.00	14.00
M22 - 1.5	48224	48225	48226	-	-	130	45	18.00	14.00
M24 - 2	47244	47245	47246	-	-	135	48	20.00	16.00
M24 - 1.5	48244	48245	48246	-	-	135	48	20.00	16.00

Note: The taps listed above represent the most popular of the Recoil taps available. Other sizes and types are available including BSW,BSF, NPT, BA, 8UN etc.

Tap dimensions based upon international (ISO) standard. Dimensions are reference only and may be changed without notice.



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Thread Size	Taper	Intermediate	Bottoming	Spiral Point	Spiral Flute	Overall Length	Thread Length	Shank Diameter	Square Drive
Unified Coarse									
#2 - 56	43524	43525	43526	43528	43529	1.875	0.562	0.141	0.110
#3 - 48	43534	43535	43536	43538	43539	1.937	0.625	0.141	0.110
#4 - 40	43544	43545	43546	43548	43549	2.000	0.687	0.141	0.110
#5 - 40	43554	43555	43556	43558	43559	2.125	0.750	0.168	0.131
#6 - 32	43564	43565	43566	43568	43569	2.375	0.875	0.194	0.152
#8 - 32	43584	43585	43586	43588	43589	2.375	0.937	0.220	0.165
#10 - 24	43604	43605	43606	43608	43609	2.500	1.000	0.255	0.191
#12 - 24	43624	43625	43626	43628	43629	2.718	1.125	0.318	0.238
1/4 - 20	43044	43045	43046	43048	43049	2.718	1.125	0.318	0.238
5/16 - 18	43054	43055	43056	43058	43059	2.937	1.250	0.381	0.286
3/8 - 16	43064	43065	43066	43068	43069	3.375	1.656	0.367	0.275
7/16 - 14	43074	43075	43076	43078	43079	3.593	1.656	0.429	0.322
1/2 - 13	43084	43085	43086	43088	43089	3.812	1.812	0.480	0.360
9/16 - 12	43094	43095	43096	43098	43099	4.031	1.812	0.542	0.406
5/8 - 11	43104	43105	43106	43108	43109	4.250	2.000	0.590	0.442
3/4 - 10	43124	43125	43126	43128	43129	4.687	2.218	0.697	0.523
7/8 - 9	43144	43145	43146	43148	43149	5.125	2.500	0.800	0.600
1 - 8	43164	43165	43166	43168	43169	5.750	2.562	1.021	0.766
1 1/8 - 7	43184	43185	43186	-	-	-	-	-	-
1 1/4 - 7	43204	43205	43206	-	-	-	-	-	-
1 3/8 - 6	43224	43225	43226	-	-	-	-	-	-
1 1/2 - 6	43244	43245	43246	-	-	-	-	-	-
Unified Fine									
#3 - 56	44534	44535	44536	43538	43589	1.937	0.625	0.141	0.110
#4 - 48	44544	44545	44546	44548	44549	2.000	0.687	0.141	0.110
#6 - 40	44564	44565	44566	44568	44569	2.125	0.750	0.168	0.131
#8 - 36	44584	44585	44586	44588	44589	2.375	0.937	0.220	0.165
#10 - 32	44604	44605	44606	44608	44609	2.500	1.000	0.255	0.191
#12 - 28	44624	44625	44626	-	-	2.718	1.125	0.318	0.238
1/4 - 28	44044	44045	44046	44048	44049	2.718	1.125	0.318	0.238
5/16 - 24	44054	44055	44056	44058	44059	2.937	1.250	0.381	0.286
3/8 - 24	44064	44065	44066	44068	44069	3.156	1.438	0.323	0.242
7/16 - 20	44074	44075	44076	44078	44079	3.375	1.656	0.367	0.275
1/2 - 20	44084	44085	44086	44088	44089	3.593	1.656	0.429	0.322
9/16 - 18	44094	44095	44096	44098	44099	3.812	1.812	0.480	0.360
5/8 - 18	44104	44105	44106	44108	44109	4.031	1.812	0.542	0.406
3/4 - 16	44124	44125	44126	44128	44129	4.468	2.000	0.652	0.489
7/8 - 14	44144	44145	44146	44148	44149	5.125	2.500	0.800	0.600
1 - 12	44164	44165	44166	44168	44169	5.437	2.562	0.896	0.672
1 - 14	44164-14	44165-14	44166-14	44168	44169	5.437	2.562	0.896	0.672
1 1/8 - 12	44184	44185	44186	-	-	-	-	-	-
1 1/4 - 12	44204	44205	44206	-	-	-	-	-	-
1 3/8 - 12	44224	44225	44226	-	-	-	-	-	-
1 1/2 - 12	44244	44245	44246	-	-	-	-	-	-

Note: Tap dimensions are based on American standard (ANSI). Dimensions are in inches. Dimensions are reference only and may be changed without notice.