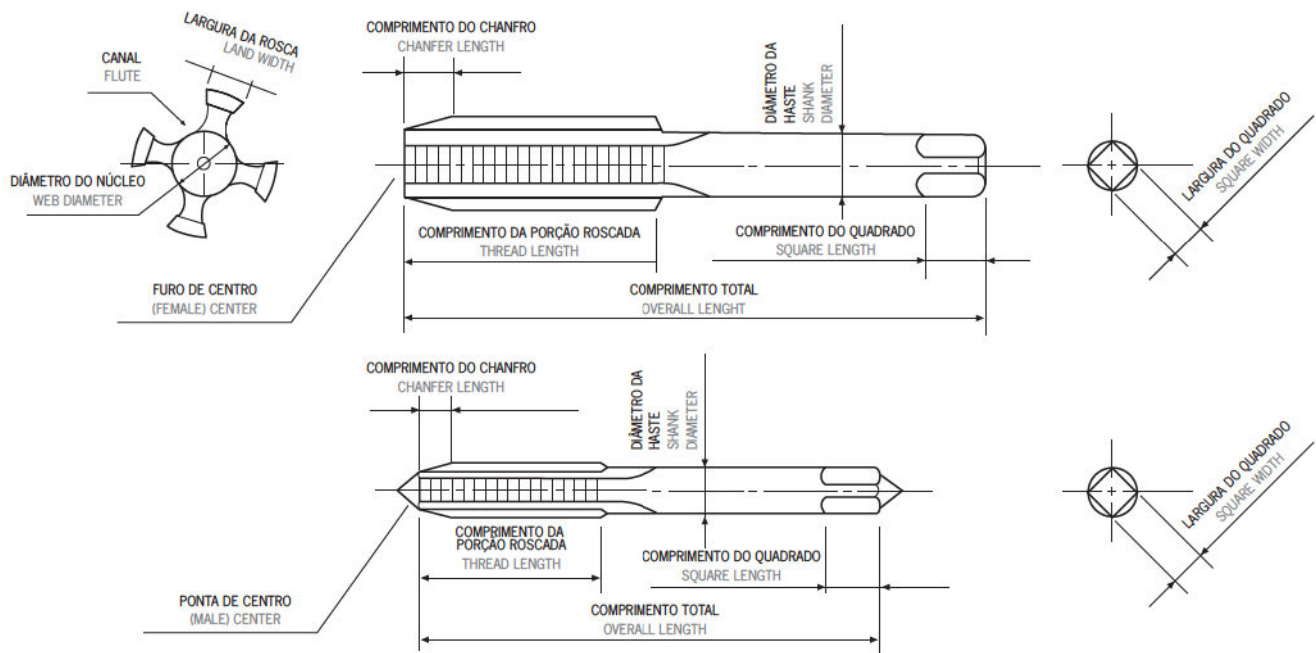






TERMINOLOGIA TERMINOLOGY



TIPOS DE MACHO E CARACTERÍSTICAS TYPE OF TAPS & FEATURES

TIPO TYPE	CARACTERÍSTICAS FEATURES	APLICAÇÃO APPLICATIONS
<p>Macho Ponta Helicoidal Spiral Pointed Taps</p> 	<ul style="list-style-type: none"> - Ponta helicoidal (direciona o cavaco) - Empurra o cavaco para Frente com baixo torque de corte - Canal raso de formato único proporciona uma estrutura resistente - Boa ação de corte - Spiral point (Chip Drive) - Pushes chips forward with low cutting torque - Shallow and unique flute form provides strong structure - Good cutting action 	<ul style="list-style-type: none"> - Para furos passantes - Para materiais em que o cavaco gerado é de forma espiral contínua - Alta velocidade de rosqueamento - For both through - Materials where chips come out continuously in coil shape - High speed tapping
<p>Macho Canal Helicoidal Spiral Fluted Taps</p> 	<ul style="list-style-type: none"> - Canal Helicoidal - Saída do cavaco em direção à Haste - Torque de rosqueamento baixo e aplicável para rosqueamento até o fundo do furo - Boa ação de corte - Spiral flute - Chips flow out against tapping direction (ejected from holes) - Lower tapping torque and applicable for tapping to the bottom of holes - Good cutting action 	<ul style="list-style-type: none"> - Para furos cegos - Para materiais em que o cavaco gerado é de forma espiral contínua - For blind holes - Materials where chips come out continuously in coil shape
<p>Macho Canal Reto Straight Fluted Taps (Hand Taps)</p> 	<ul style="list-style-type: none"> - Canal reto - Arestas de corte resistentes - Fácil de reafiar - Straight flute - Strong cutting edges - Applicable for various cutting conditions - Easy to regrind 	<ul style="list-style-type: none"> - Para ambos os tipos de furo: cego e passante - Para materiais onde o cavaco é gerado na forma de pó - Para materiais duros - For both through & blind holes (Short thread depth only) - Materials where chips come out in powder form - Hard materials
<p>Macho Laminador Fluteless Taps (Forming Taps)</p> 	<ul style="list-style-type: none"> - Sem canal - Não produz cavaco - Uniformidade precisa do limite da rosca feita - Excelente rigidez - Fluteless - Taps do not produce chips - Precise uniformity of tapped thread limit - Excellent rigidity 	<ul style="list-style-type: none"> - Para ambos os tipos de furo: cego e passante - Para materiais com boa plasticidade - For both through & blind holes - Materials with formability

DIÂMETROS DE FUROS PARA ROSCAR

Hole Diameter for Thread

MACHOS
TUBOS

M DIN 13. ISO 724/965.1		
D (mm)	P	ø Furo
M 1.0	0.25	0.8
M 1.1	0.25	0.9
M 1.2	0.25	1.0
M 1.4	0.3	1.1
M 1.6	0.35	1.3
M 1.8	0.35	1.5
M 2.0	0.4	1.6
M 2.2	0.45	1.8
M 2.5	0.45	2.1
M 3.0	0.5	2.5
M 3.5	0.6	2.9
M 4.0	0.7	3.3
M 4.5	0.75	3.8
M 5.0	0.8	4.2
M 6.0	1	5.0
M 7.0	1	6.0
M 8.0	1.25	6.8
M 9.0	1.25	7.8
M 10.0	1.5	8.5
M 11.0	1.5	9.5
M 12.0	1.75	10.3
M 14.0	2	12.1
M 16.0	2	14.1
M 18.0	2.5	15.6
M 20.0	2.5	17.6
M 22.0	2.5	19.6
M 24.0	3	21.1
M 27.0	3	24.1
M 30.0	3.5	26.6
M 33.0	3.5	29.6
M 36.0	4	32.1
M 39.0	4	35.1
M 42.0	4.5	37.6
M 45.0	4.5	40.6
M 48.0	5	43.1
M 52.0	5	47.1
M 56.0	5.5	50.6
M 60.0	5.5	54.6
M 64.0	6	58.2
M 68.0	6	62.2

M DIN 13		
D (mm)	P	ø Furo
M 1.7	0.35	1.4
M 2.3	0.4	1.9
M 2.6	0.45	2.2

BSW (W) BS 84 DIN 11		
D" (in)	N/1"	ø Furo
W 1/16	60	1.1
W 3/32	48	1.8
W 1/8	40	2.4
W 5/32	32	3.1
W 3/16	24	3.5
W 7/32	24	4.3
W 1/4	20	4.9
W 5/16	18	6.3
W 3/8	16	7.7
W 7/16	14	9.0
W 1/2	12	10.3
W 9/16	12	11.8
W 5/8	11	13.2
W 11/16	11	14.8
W 3/4	10	16.1
W 7/8	9	19.0
W 1	8	21.7
W 1 1/8	7	24.4
W 1 1/4	7	27.6
W 1 3/8	6	30.0
W 1 1/2	6	33.2
W 1 5/8	5	35.4
W 1 3/4	5	38.6
W 1 7/8	4 1/2	41.1
W 2	4 1/2	44.3
W 2 1/4	4	49.8
W 2 1/2	4	56.2
W 2 3/4	3 1/2	61.5
W 3	3 1/2	67.8

MF DIN 13. ISO 724/965.1		
D (mm)	P	ø Furo
M 1.0	0.2	0.8
M 1.1	0.2	0.9
M 1.2	0.2	1.0
M 1.4	0.2	1.2
M 1.6	0.2	1.4
M 1.8	0.2	1.6
M 2.0	0.25	1.8
M 2.2	0.25	2.0
M 2.5	0.35	2.2
M 3.0	0.35	2.7
M 3.5	0.35	3.2
M 4.0	0.5	3.5
M 4.5	0.5	4.0
M 5.0	0.5	4.5
M 5.5	0.5	5.0
M 6.0	0.75	5.3
M 7.0	0.75	6.3
M 8.0	0.75	7.3
M 9.0	0.75	8.3
M 10.0	0.75	9.3
M 11.0	0.75	10.3
M 8.0	1	7.0
M 9.0	1	8.0
M 10.0	1	9.0
M 11.0	1	10.0
M 12.0	1	11.0
M 14.0	1	13.0
M 15.0	1	14.0
M 16.0	1	15.0
M 17.0	1	16.0
M 18.0	1	17.0
M 20.0	1	19.0
M 22.0	1	21.0
M 24.0	1	23.0
M 25.0	1	24.0
M 27.0	1	26.0
M 28.0	1	27.0
M 30.0	1	29.0
M 10.0	1.25	8.8
M 12.0	1.25	10.8
M 14.0	1.25	12.8
M 12.0	1.5	10.5
M 14.0	1.5	12.5
M 15.0	1.5	13.5
M 16.0	1.5	14.5
M 17.0	1.5	15.5
M 18.0	1.5	16.5
M 20.0	1.5	18.5
M 22.0	1.5	20.5
M 24.0	1.5	22.5
M 25.0	1.5	23.5
M 26.0	1.5	24.5

G (BSP) ISO228/1.DIN259.BS2779		
D" (in)	N/1"	ø Furo
G 1/16	28	6.7
G 1/8	28	8.7
G 1/4	19	11.6
G 3/8	19	15.1
G 1/2	14	18.9
G 5/8	14	20.8
G 3/4	14	24.3
G 7/8	14	28.1
G 1	11	30.6
G 1 1/8	11	35.2
G 1 1/4	11	39.2
G 1 3/8	11	41.7
G 1 1/2	11	45.1
G 1 3/4	11	51.1
G 2	11	57.0
G 2 1/4	11	63.0
G 2 1/2	11	72.5
G 2 3/4	11	78.9
G 3	11	85.2
G 3 1/4	11	91.3
G 3 1/2	11	97.7
G 3 3/4	11	104.4
G 4	11	110.4

MF DIN 13. ISO 724/965.1		
D (mm)	P	ø Furo
M 27	1.5	25.5
M 28	1.5	26.5
M 30	1.5	28.5
M 32	1.5	30.5
M 33	1.5	31.5
M 35	1.5	33.5
M 36	1.5	34.5
M 38	1.5	36.5
M 39	1.5	37.5
M 40	1.5	38.5
M 42	1.5	40.5
M 45	1.5	43.5
M 48	1.5	46.5
M 50	1.5	48.5
M 52	1.5	50.5
M 18	2	16.1
M 20	2	18.1
M 22	2	20.1
M 24	2	22.1
M 25	2	23.1
M 27	2	25.1
M 28	2	26.1
M 30	2	28.1
M 32	2	30.1
M 33	2	31.1
M 36	2	34.1
M 39	2	37.1
M 40	2	38.1
M 42	2	40.1
M 45	2	43.1
M 48	2	46.1
M 50	2	48.1
M 52	2	50.1
M 30	3	27.1
M 33	3	30.1
M 36	3	33.1
M 39	3	36.1
M 40	3	37.1
M 42	3	39.1
M 45	3	42.1
M 48	3	45.1
M 50	3	47.1
M 52	3	49.1
M 42	4	38.1
M 45	4	41.1
M 48	4	44.1
M 52	4	48.1

BA			
D" (in)	P mm	ø d1 máx mm	Broca ø Furo mm
N.º 0	0	5,175	5,1
N.º 1	0,9	4,560	4,5
N.º 2	0,81	4,035	4
N.º 3	0,73	3,495	3,5
N.º 4	0,66	3,060	3
N.º 5	0,59	2,710	2,6
N.º 6	0,53	2,360	2,3
N.º 7	0,48	2,100	2
N.º 8	0,43	1,840	1,8
N.º 9	0,39	1,575	1,5
N.º 10	0,35	1,410	1,3
N.º 11	0,31	1,245	1,2

UNC ASME B1.1		
D" (in)	P	ø Furo
Nº 1	64	1.5
Nº 2	56	1.8
Nº 3	48	2.0
Nº 4	40	2.3
Nº 5	40	2.6
Nº 6	32	2.8
Nº 8	32	3.4
Nº 10	24	3.9
Nº 12	24	4.5
1/4	20	5.2
5/16	18	6.7
3/8	16	8.1
7/16	14	9.5
1/2	13	10.9
9/16	12	12.4
5/8	11	13.8
3/4	10	16.8
7/8	9	19.7
1	8	22.5
1 1/8	7	25.3
1 1/4	7	28.5
1 3/8	6	31.1
1 1/2	6	34.3
1 3/4	5	39.9
2	4 1/2	45.1
2 1/4	4 1/2	51.5
2 1/2	4	57.8
2 3/4	4	64.1
3	4	70.5

UNF ASME B1.1		
D" (in)	P	ø Furo
Nº 0	80	1.0
Nº 1	72	1.5
Nº 2	64	1.8
Nº 3	56	2.1
Nº 4	48	2.4
Nº 5	44	2.6
Nº 6	40	2.9
Nº 8	36	3.5
Nº 10	32	4.1
Nº 12	28	4.6
1/4	28	5.5
5/16	24	7.0
3/8	24	8.6
7/16	20	10.0
1/2	20	11.6
9/16	18	13.0
5/8	18	14.6
3/4	16	17.6
7/8	14	20.6
1	12	23.5
1 1/8	12	26.6
1 1/4	12	29.9
1 3/8	12	32.5
1 1/2	12	36.2

Pg Rosca Para Tubo Blindado		
D	ø d1 máx mm	Broca ø Furo mm
Pg 7	11,43	11,4
Pg 9	14,01	14
Pg 11	17,41	17,3
Pg 13,5	19,21	19
Pg 16	21,31	21,25
Pg 21	27,03	26,8
Pg 29	35,73	35,5
Pg 36	45,73	45,5
Pg 42	52,73	52,5
Pg 48	58,03	58

NPT		ANSI B2.1	
D" (in)	N/1"	ø Furo	
1/16	27	6.2	
1/8	27	8.4	
1/4	18	11.1	
3/8	18	14.3	
1/2	14	17.9	
3/4	14	23.0	
1	11 1/2	29.0	
1 1/4	11 1/2	37.7	
1 1/2	11 1/2	43.5	
2	11 1/2	56.0	
2 1/2	8	66.7	
3	8	83.0	

NPSM		ANSI B2.1	
D" (in)	N/1"	ø Furo	
1/16	27	6.2	
1/8	27	9.1	
1/4	18	12.0	
3/8	18	15.5	
1/2	14	19.1	
3/4	14	24.5	
1	11 1/2	30.6	
1 1/4	11 1/2	39.4	
1 1/2	11 1/2	45.4	
2	11 1/2	57.5	
2 1/2	8	67.1	

UNEF		ANSI B2.1	
D" (in)	N/1"	ø Furo	
Nº 12	32	4.8	
1/4	32	5.6	
5/16	32	7.2	
3/8	32	8.8	
7/16	28	10.3	
1/2	28	11.9	
9/16	24	13.3	
5/8	24	14.9	
1 1/16	24	16.5	
3/4	20	17.9	
1 3/16	20	19.5	
7/8	20	21.1	
1 5/16	20	22.7	
1	20	24.3	
1 1/16	18	25.7	
1 1/8	18	27.3	
1 3/16	18	28.9	
1 1/4	18	30.5	
1 5/16	18	32.1	
1 3/8	18	33.7	
1 7/16	18	35.2	
1 1/2	18	36.8	
1 9/16	18	38.4	
1 5/8	18	40.0	
1 11/16	18	41.6	

FÓRMULA:
 ϕ da broca = D - P
 D: DIÂMETRO EXTERNO
 P: PASSO
 Exemplo:
 M14 x 2
 ϕ da broca = 14.0 - 2.0 = 12.0

Obs.: Aplicar a fórmula somente para roscas Métrica e Unificada.

NPTF		ANSI B2.1	
D" (in)	N/1"	ø Furo	
1/16	27	6.2	
1/8	27	8.6	
1/4	18	11.1	
3/8	18	14.7	
1/2	14	17.9	
3/4	14	23.4	
1	11 1/2	29.4	
1 1/4	11 1/2	38.1	
1 1/2	11 1/2	44.0	
2	11 1/2	56.4	
2 1/2	8	67.1	
3	8	83.0	

NPSM		ANSI B2.1	
D" (in)	N/1"	ø Furo	
1/16	27	6.2	
1/8	27	8.7	
1/4	18	11.2	
3/8	18	14.7	
1/2	14	18.3	
3/4	14	23.4	
1	11 1/2	29.4	
1 1/4	11 1/2	38.1	
1 1/2	11 1/2	44.5	
2	11 1/2	56.4	
2 1/2	8	67.1	

NPSF / NPSI		ANSI B2.1	
D" (in)	N/1"	ø Furo	
1/16	27	6.4	
1/8	27	8.7	
1/4	18	11.4	
3/8	18	14.8	
1/2	14	18.3	
3/4	14	23.6	
1	11 1/2	29.7	

MACHO LAMINADOR

UNC		ASME B1.1	
D" (in)	N/1"	ø Furo	
Nº 1	64	1.7	
Nº 2	56	2.0	
Nº 3	48	2.3	
Nº 4	40	2.6	
Nº 5	40	2.9	
Nº 6	32	3.1	
Nº 8	32	3.8	
Nº 10	24	4.3	
Nº 12	24	5.0	
1/4	20	5.8	
5/16	18	7.3	
3/8	16	8.8	
7/16	14	10.3	
1/2	13	11.8	
9/16	12	13.3	
5/8	11	14.8	

UNF		ASME B1.1	
D" (in)	N/1"	ø Furo	
Nº 1	72	1.7	
Nº 2	64	2.0	
Nº 3	56	2.3	
Nº 4	48	2.6	
Nº 5	44	2.9	
Nº 6	40	3.2	
Nº 8	36	3.8	
Nº 10	32	4.5	
Nº 12	28	5.1	
1/4	28	5.9	
5/16	24	7.5	
3/8	24	9.0	

M		ANSI B2.1	
D (mm)	N/1"	ø Furo	
M 1.0	0.25	0.9	
M 1.1	0.25	1.0	
M 1.2	0.25	1.1	
M 1.4	0.3	1.3	
M 1.6	0.35	1.4	
M 1.7	0.35	1.5	
M 1.8	0.35	1.6	
M 2.0	0.4	1.8	
M 2.2	0.45	2	
M 2.3	0.4	2.1	
M 2.5	0.45	2.3	
M 2.6	0.45	2.4	
M 3.0	0.5	2.8	
M 3.5	0.6	3.2	
M 4.0	0.7	3.7	
M 4.5	0.75	4.2	
M 5.0	0.8	4.6	
M 6.0	1	5.5	
M 7.0	1	6.5	
M 8.0	1.25	7.4	
M 9.0	1.25	8.4	
M 10.0	1.5	9.3	
M 11.0	1.5	10.3	
M 12.0	1.75	11.2	
M 14.0	2	13.1	
M 16.0	2	15.1	

MF DIN 13.ISO724/965.1		
D (mm)	N/1"	ø Furo
M 4	0.5	3.8
M 5	0.5	4.8
M 6	0.5	5.8
M 6	0.75	5.7
M 8	0.75	7.7
M 8	1	7.5
M 10	1	9.5
M 12	1	11.5
M 14	1	13.5
M 16	1	15.5
M 12	1.5	11.3
M 14	1.5	13.3
M 16	1.5	15.3
M 18	1.5	17.3
M 20	1.5	19.3

FÓRMULA:
 ϕ da broca = D - (P/2)
 D: DIÂMETRO EXTERNO
 P: PASSO
 Exemplo:
 M14 x 2
 ϕ da broca = 14.0 - (2/2) = 13.0

Obs.: Aplicar a fórmula somente para roscas Métrica e Unificada.



TIPO DE MATERIAL	VELOCIDADE DE CORTE (m/min)			LAMINADOR	ÓLEO DE CORTE
	MT	SFT	POT		
Aço com baixo teor de Carbono 0,2%	8 ~ 13	8 ~ 13	15 ~ 25	8 ~ 13	Sulfoclorado
Aço com médio teor de Carbono 0,25% ~ 0,40%	7 ~ 12	7 ~ 12	10 ~ 15	7 ~ 10	
Aço com alto teor de Carbono 0,45%	6 ~ 9	6 ~ 9	8 ~ 13	5 ~ 8	
Aço com liga de Cromo	7 ~ 12	7 ~ 12	10 ~ 15	5 ~ 8	
Aço para tratamentos diversos 25 ~ 45 HrC	3 ~ 5	3 ~ 5	4 ~ 6		
Aço Inoxidável Ferrítico	4 ~ 7	5 ~ 8	8 ~ 13	5 ~ 10	
Aço Inoxidável Austenítico	3 ~ 5	3 ~ 5	4 ~ 6		
Aço Ferramenta	6 ~ 9	6 ~ 9	7 ~ 10		
Aço Forjado	6 ~ 11	6 ~ 11	10 ~ 15		
Aço Fundido Cinzento	10 ~ 15				Solúvel Seco
Aço Fundido Nodular	7 ~ 12	7 ~ 12	7 ~ 20		
Cobre	6 ~ 9	6 ~ 11	7 ~ 12	7 ~ 12	Integral Solúvel Querosene
Latão	6 ~ 11	6 ~ 11	10 ~ 20	7 ~ 12	
Alumínio	10 ~ 20	10 ~ 20	15 ~ 25	10 ~ 20	
Liga de Alumínio	10 ~ 15	10 ~ 15	15 ~ 20	10 ~ 15	
Liga de Magnésio	7 ~ 12	7 ~ 12	10 ~ 15		
Plástico Duro	10 ~ 20				Seco com ar Integral Água
Termo Plástico	10 ~ 20	10 ~ 15	10 ~ 20		

MT = Macho máquina Canal Reto

SFT = Macho máquina Canal Helicoidal

POT = Macho máquina Ponta Helicoidal

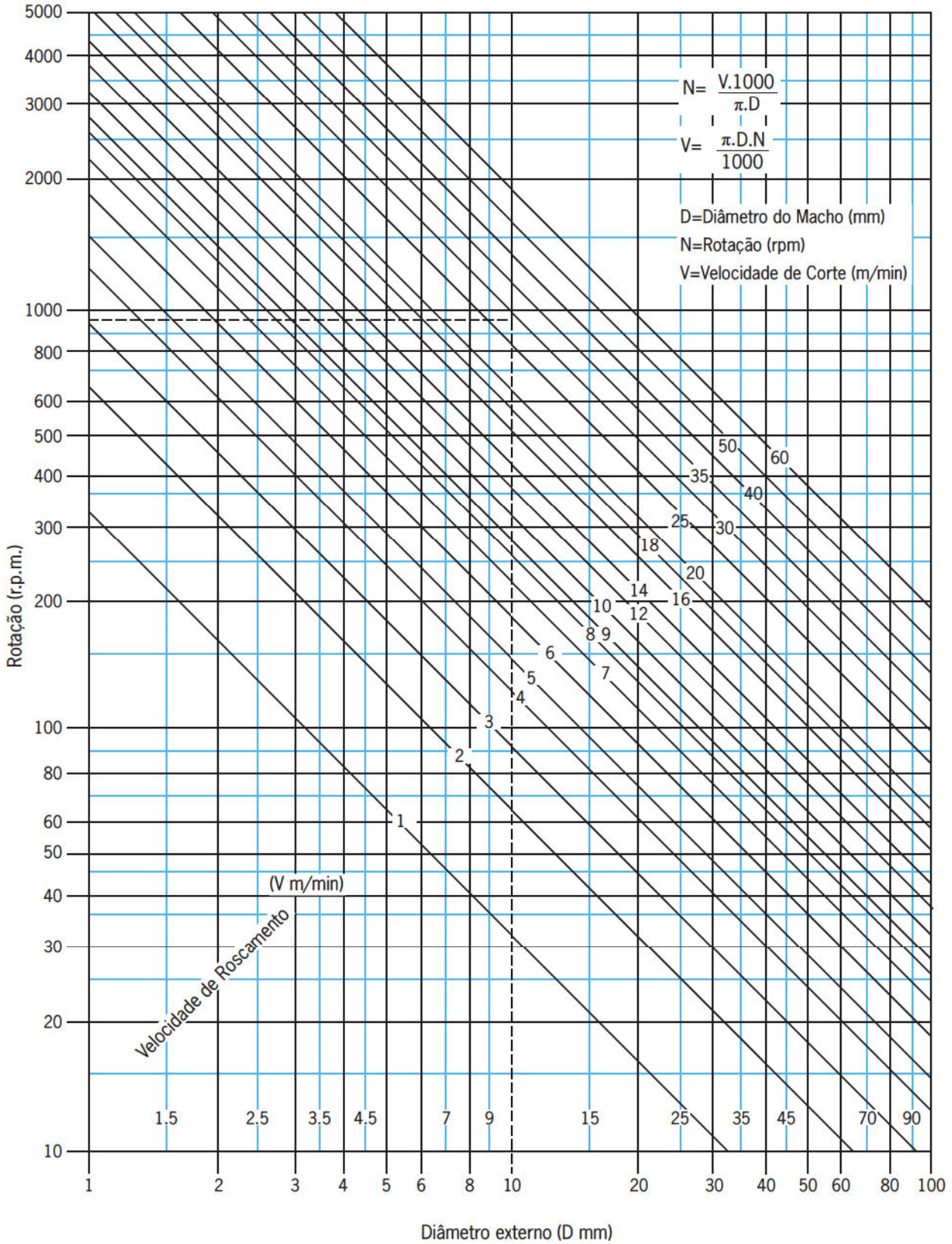


TABELA DE CONVERSÃO DE DUREZAS

Hardness Conversion Table

(HRC) DUREZA ROCKWELL ESCALA C 150g CONE DE DIAMANTE	DUREZA VICKERS PIRÂMIDE DE DIAMANTE	DUREZA BRINELL			DUREZA ROCKWELL			DUREZA ROCKWELL SUPERFICIAL			(HS) NÚMERO DE DUREZA SHORE	RESISTÊNCIA APROXIMADA N/mm²	(HRC) DUREZA ROCKWELL ESCALA C 150g CONE DE DIAMANTE
		ESFERA PADRÃO 10mm	ESFERA HULTGREN 10mm	ESFERA DE METAL DURO 10mm	(HRA) ESCALA A 60kg CONE DE DIAMANTE	(HRB) ESCALA B 100kg ESFERA DE 1/16 POL.	(HRD) ESCALA D 100kg CONE DE DIAMANTE	15N	30N	45N			
68	940	-	-	-	85.6	-	76.9	93.2	84.4	75.4	97	-	68
67	900	-	-	-	85.0	-	76.1	92.9	83.6	74.2	95	-	67
66	865	-	-	-	84.5	-	75.4	92.5	82.8	73.3	92	-	66
65	832	-	-	739	83.9	-	74.5	92.2	81.9	72.0	91	-	65
64	800	-	-	722	83.4	-	73.8	91.8	81.1	71.0	88	-	64
63	772	-	-	705	82.8	-	73.0	91.4	80.1	69.9	87	-	63
62	746	-	-	688	82.3	-	72.2	91.1	79.3	68.8	85	-	62
61	720	-	-	670	81.8	-	71.5	90.7	78.4	67.7	83	-	61
60	697	-	613	654	81.2	-	70.7	90.2	77.5	66.6	81	-	60
59	674	-	599	634	80.7	-	69.9	89.8	76.6	65.5	80	-	59
58	653	-	587	615	80.1	-	69.2	89.3	75.7	64.3	78	-	58
57	633	-	575	595	79.6	-	68.5	88.9	74.8	63.2	76	-	57
56	613	-	561	577	79.0	-	67.7	88.3	73.9	62.0	75	-	56
55	595	-	546	560	78.5	-	66.9	87.9	73.0	60.9	74	2079	55
54	577	-	534	543	78.0	-	66.1	87.4	72.0	59.8	72	2010	54
53	560	-	519	525	77.4	-	65.4	86.9	71.2	58.6	71	1952	53
52	544	500	508	512	76.8	-	64.6	86.4	70.2	57.4	69	1883	52
51	528	487	494	496	76.3	-	63.8	85.9	69.4	56.1	68	1824	51
50	513	475	481	481	75.9	-	63.1	85.5	68.5	55.0	67	1755	50
49	498	464	469	469	75.2	-	62.1	85.0	67.6	53.8	66	1687	49
48	484	451	455	455	74.7	-	61.4	84.5	66.7	52.5	64	1638	48
47	471	442	443	443	74.1	-	60.8	83.9	65.8	51.4	63	1579	47
46	458	432	432	432	73.6	-	60.0	83.5	64.8	50.3	62	1530	46
45	446	421	421	421	73.1	-	59.2	83.0	64.0	49.0	60	1481	45
44	434	409	409	409	72.5	-	58.5	82.5	63.1	47.8	58	1432	44
43	423	400	400	400	72.0	-	57.7	82.0	62.2	46.7	57	1383	43
42	412	390	390	390	71.5	-	56.9	81.5	61.3	45.5	56	1334	42
41	402	381	381	381	70.9	-	56.2	80.9	60.4	44.3	55	1294	41
40	392	371	371	371	70.4	-	55.4	80.4	59.5	43.1	54	1245	40
39	382	362	362	362	69.9	-	54.6	79.9	58.6	41.9	52	1216	39
38	372	353	353	353	69.4	-	53.8	79.4	57.7	40.8	51	1177	38
37	363	344	344	344	68.9	-	53.1	78.8	56.8	39.6	50	1157	37
36	354	336	336	336	68.4	(109.0)	52.3	78.3	55.9	38.4	49	1118	36
35	345	327	327	327	67.9	(108.5)	51.5	77.7	55.0	37.2	48	1079	35
34	336	319	319	319	67.4	(108.0)	50.8	77.2	54.2	36.1	47	1059	34
33	327	311	311	311	66.8	(107.5)	50.0	76.6	53.3	34.9	46	1030	33
32	318	301	301	301	66.3	(107.0)	49.2	76.1	52.1	33.7	44	1000	32
31	310	294	294	294	65.8	(106.0)	48.4	75.6	51.3	32.5	43	981	31
30	302	286	286	286	65.3	(105.5)	47.7	75.0	50.4	31.3	42	951	30
29	294	279	279	279	64.7	(104.5)	47.0	74.5	49.5	30.1	41	932	29
28	286	271	271	271	64.3	(104.0)	46.1	73.9	48.6	28.9	41	912	28
27	279	264	264	264	63.8	(103.0)	45.2	73.3	47.7	27.8	40	883	27
26	272	258	258	258	63.3	(102.5)	44.6	72.8	46.8	26.7	38	863	26
25	266	253	253	253	62.8	(101.5)	43.8	72.2	45.9	25.5	38	843	25
24	260	247	247	247	62.4	(101.0)	43.1	71.6	45.0	24.3	37	824	24
23	254	243	243	243	62.0	100.0	42.1	71.0	44.0	23.1	36	804	23
22	248	237	237	237	61.5	99.0	41.6	70.5	43.2	22.0	35	785	22
21	243	231	231	231	61.0	98.5	40.9	69.9	42.3	20.7	35	775	21
20	238	226	226	226	60.5	97.8	40.1	69.4	41.5	19.6	34	755	20
(18)	230	219	219	219	-	96.7	-	-	-	-	33	736	(18)
(16)	222	212	212	212	-	95.5	-	-	-	-	32	706	(16)
(14)	213	203	203	203	-	93.9	-	-	-	-	31	677	(14)
(12)	204	194	194	194	-	92.3	-	-	-	-	29	647	(12)
(10)	196	187	187	187	-	90.7	-	-	-	-	28	618	(10)
(8)	188	179	179	179	-	89.5	-	-	-	-	27	598	(8)
(6)	180	171	171	171	-	87.1	-	-	-	-	26	579	(6)
(4)	173	165	165	165	-	85.5	-	-	-	-	25	549	(4)
(2)	166	158	158	158	-	83.5	-	-	-	-	24	530	(2)
(0)	160	152	152	152	-	81.7	-	-	-	-	24	520	(0)

Na tabela acima, valores entre parenteses não são comumente usados. Escalas Rockwell A, C e D são usadas com penetrador de diamante.

In above chart, figures with () are not commonly used. Rockwell scale A, C and D are scaled with diamond brale.

CONVERSÃO DE POLEGADA PARA MILÍMETRO

Decimal Equivalent
of Tool Sizes

OSG SULAMERICANA

Polegada		Unidade de Polegada (milímetros)								
Fração	Decimal	0	1	2	3	4	5	6	7	8
0	0	0	25,400 0	50,800 0	76,200 0	101,600 0	127,000 0	152,400 0	177,800 0	203,200 0
1/64	0,015 625	0,396 9	25,796 9	51,196 9	76,596 9	101,996 9	127,396 9	152,796 9	178,196 9	203,596 9
1/32	0,031 25	0,793 8	26,193 8	51,593 8	76,993 8	102,393 8	127,793 8	153,193 8	178,593 8	203,993 8
3/64	0,046 875	1,190 6	26,590 6	51,990 6	77,390 6	102,790 6	128,190 6	153,590 6	178,990 6	204,390 6
1/16	0,062 5	1,587 5	26,987 5	52,387 5	77,787 5	103,187 5	128,587 5	153,987 5	179,387 5	204,787 5
5/64	0,078 125	1,984 4	27,384 4	52,784 4	78,184 4	103,584 4	128,984 4	154,384 4	179,784 4	205,184 4
3/32	0,093 75	2,381 2	27,781 2	53,181 2	78,581 2	103,981 2	129,381 2	154,781 2	180,181 2	205,581 2
7/64	0,109 375	2,778 1	28,178 1	53,578 1	78,978 1	104,378 1	129,778 1	155,178 1	180,578 1	205,978 1
1/8	0,125	3,175 0	28,575 0	53,975 0	79,375 0	104,775 0	130,175 0	155,575 0	180,975 0	206,375 0
9/64	0,140 625	3,571 9	28,971 9	54,371 9	79,771 9	105,171 9	130,571 9	155,971 9	181,371 9	206,771 9
5/32	0,156 25	3,968 8	29,368 8	54,768 8	80,168 8	105,568 8	130,968 8	156,368 8	181,768 8	207,168 8
11/64	0,171 875	4,365 6	29,765 6	55,165 6	80,565 6	105,965 6	131,365 6	156,765 6	182,165 6	207,565 6
3/16	0,187 5	4,762 5	30,162 5	55,562 5	80,962 5	106,362 5	131,762 5	157,162 5	182,562 5	207,962 5
13/64	0,203 125	5,159 4	30,559 4	55,959 4	81,359 4	106,759 4	132,159 4	157,559 4	182,959 4	208,359 4
7/32	0,218 75	5,556 2	30,956 2	56,356 2	81,756 2	107,156 2	132,556 2	157,956 2	183,356 2	208,756 2
15/64	0,234 375	5,953 1	31,353 1	56,753 1	82,153 1	107,553 1	132,953 1	158,353 1	183,753 1	209,153 1
1/4	0,25	6,350 0	31,750 0	57,150 0	82,550 0	107,950 0	133,350 0	158,750 0	184,150 0	209,550 0
17/64	0,265 625	6,746 9	32,146 9	57,546 9	82,946 9	108,346 9	133,746 9	159,146 9	184,546 9	209,946 9
9/32	0,281 25	7,143 8	32,543 8	57,943 8	83,343 8	108,743 8	134,143 8	159,543 8	184,943 8	210,343 8
19/64	0,296 875	7,540 6	32,940 6	58,340 6	83,740 6	109,140 6	134,540 6	159,940 6	185,340 6	210,740 6
5/16	0,312 5	7,937 5	33,337 5	58,737 5	84,137 5	109,537 5	134,937 5	160,337 5	185,737 5	211,137 5
21/64	0,328 125	8,334 4	33,734 4	59,134 4	84,534 4	109,934 4	135,334 4	160,734 4	186,134 4	211,534 4
11/32	0,343 75	8,731 2	34,131 2	59,531 2	84,931 2	110,331 2	135,731 2	161,131 2	186,531 2	211,931 2
23/64	0,359 375	9,128 1	34,528 1	59,928 1	85,328 1	110,728 1	136,128 1	161,528 1	186,928 1	212,328 1
3/8	0,375	9,525 0	34,925 0	60,325 0	85,725 0	111,125 0	136,525 0	161,925 0	187,325 0	212,725 0
25/64	0,390 625	9,921 9	35,321 9	60,721 9	86,121 9	111,521 9	136,921 9	162,321 9	187,721 9	213,121 9
13/32	0,406 25	10,318 8	35,718 8	61,118 8	86,518 8	111,918 8	137,318 8	162,718 8	188,118 8	213,518 8
27/64	0,421 875	10,715 6	36,115 6	61,515 6	86,915 6	112,315 6	137,715 6	163,115 6	188,515 6	213,915 6
7/16	0,437 5	11,112 5	36,512 5	61,912 5	87,312 5	112,712 5	138,112 5	163,512 5	188,912 5	214,312 5
29/64	0,453 125	11,509 4	36,909 4	62,309 4	87,709 4	113,109 4	138,509 4	163,909 4	189,309 4	214,709 4
15/32	0,468 75	11,906 2	37,306 2	62,706 2	88,106 2	113,506 2	138,906 2	164,306 2	189,706 2	215,106 2
31/64	0,484 375	12,303 1	37,703 1	63,103 1	88,503 1	113,903 1	139,303 1	164,703 1	190,103 1	215,503 1
1/2	0,5	12,700 0	38,100 0	63,500 0	88,900 0	114,300 0	139,700 0	165,100 0	190,500 0	215,900 0
33/64	0,515 625	13,096 9	38,496 9	63,896 9	89,296 9	114,696 9	140,096 9	165,496 9	190,896 9	216,296 9
17/32	0,531 25	13,493 8	38,893 8	64,293 8	89,693 8	115,093 8	140,493 8	165,893 8	191,293 8	216,693 8
35/64	0,546 875	13,890 6	39,290 6	64,690 6	90,090 6	115,490 6	140,890 6	166,290 6	191,690 6	217,090 6
9/16	0,562 5	14,287 5	39,687 5	65,087 5	90,487 5	115,887 5	141,287 5	166,687 5	192,087 5	217,487 5
37/64	0,578 125	14,684 4	40,084 4	65,484 4	90,884 4	116,284 4	141,684 4	167,084 4	192,484 4	217,884 4
19/32	0,593 75	15,081 2	40,481 2	65,881 2	91,281 2	116,681 2	142,081 2	167,481 2	192,881 2	218,281 2
39/64	0,609 375	15,478 1	40,878 1	66,278 1	91,678 1	117,078 1	142,478 1	167,878 1	193,278 1	218,678 1
5/8	0,625	15,875 0	41,275 0	66,675 0	92,075 0	117,475 0	142,875 0	168,275 0	193,675 0	219,075 0
41/64	0,640 625	16,271 9	41,671 9	67,071 9	92,471 9	117,871 9	143,271 9	168,671 9	194,071 9	219,471 9
21/32	0,656 25	16,668 8	42,068 8	67,468 8	92,868 8	118,268 8	143,668 8	169,068 8	194,468 8	219,868 8
43/64	0,671 875	17,065 6	42,465 6	67,865 6	93,265 6	118,665 6	144,065 6	169,465 6	194,865 6	220,265 6
11/16	0,687 5	17,462 5	42,862 5	68,262 5	93,662 5	119,062 5	144,462 5	169,862 5	195,262 5	220,662 5
45/64	0,703 125	17,859 4	43,259 4	68,659 4	94,059 4	119,459 4	144,859 4	170,259 4	195,659 4	221,059 4
23/32	0,718 75	18,256 2	43,656 2	69,056 2	94,456 2	119,856 2	145,256 2	170,656 2	196,056 2	221,456 2
47/64	0,734 375	18,653 1	44,053 1	69,453 1	94,853 1	120,253 1	145,653 1	171,053 1	196,453 1	221,853 1
3/4	0,75	19,050 0	44,450 0	69,850 0	95,250 0	120,650 0	146,050 0	171,450 0	196,850 0	222,250 0
49/64	0,765 625	19,446 9	44,846 9	70,246 9	95,646 9	121,046 9	146,446 9	171,846 9	197,246 9	222,646 9
25/32	0,781 25	19,843 8	45,243 8	70,643 8	96,043 8	121,443 8	146,843 8	172,243 8	197,643 8	223,043 8
51/64	0,796 875	20,240 6	45,640 6	71,040 6	96,440 6	121,840 6	147,240 6	172,640 6	198,040 6	223,440 6
13/16	0,812 5	20,637 5	46,037 5	71,437 5	96,837 5	122,237 5	147,637 5	173,037 5	198,437 5	223,837 5
53/64	0,828 125	21,034 4	46,434 4	71,834 4	97,234 4	122,634 4	148,034 4	173,434 4	198,834 4	224,234 4
27/32	0,843 75	21,431 2	46,831 2	72,231 2	97,631 2	123,031 2	148,431 2	173,831 2	199,231 2	224,631 2
55/64	0,859 375	21,828 1	47,228 1	72,628 1	98,028 1	123,428 1	148,828 1	174,228 1	199,628 1	225,028 1
7/8	0,875	22,225 0	47,625 0	73,025 0	98,425 0	123,825 0	149,225 0	174,625 0	200,025 0	225,425 0
57/64	0,890 625	22,621 9	48,021 9	73,421 9	98,821 9	124,221 9	149,621 9	175,021 9	200,421 9	225,821 9
29/32	0,906 25	23,018 8	48,418 8	73,818 8	99,218 8	124,618 8	150,018 8	175,418 8	200,818 8	226,218 8
59/64	0,921 875	23,415 6	48,815 6	74,215 6	99,615 6	125,015 6	150,415 6	175,815 6	201,215 6	226,615 6
15/16	0,937 5	23,812 5	49,212 5	74,612 5	100,012 5	125,412 5	150,812 5	176,212 5	201,612 5	227,012 5
61/64	0,953 125	24,209 4	49,609 4	75,009 4	100,409 4	125,809 4	151,209 4	176,609 4	202,009 4	227,409 4
31/32	0,968 75	24,606 2	50,006 2	75,406 2	100,806 2	126,206 2	151,606 2	177,006 2	202,406 2	227,806 2
63/64	0,984 375	25,003 1	50,403 1	75,803 1	101,203 1	126,603 1	152,003 1	177,403 1	202,803 1	228,203 1

ROSCA UNIFICADA E AMERICANA							ROSCA INGLESA					
Ø	UNC (NC)	UNF (NF)	UNEF (NEF)	UN (N)	UNS (NS)	NPS NPT API	BSW	BSF	BRASS	BS Con.	WHIT	BSPT
1/16	-	-	-	-	-	27	60	-	-	-	-	-
3/32	-	-	-	-	-	-	48	-	-	-	-	-
1/8	-	-	-	-	-	27	40	-	-	-	-	28
5/32	-	-	-	-	-	-	32	-	-	-	-	-
3/16	-	-	-	-	-	-	24	32	-	-	-	-
7/32	-	-	-	-	-	-	24	32	-	-	-	-
Nº 0	-	80	-	-	-	-	-	-	-	-	-	-
Nº 1	64	72	-	-	-	-	-	-	-	-	-	-
Nº 2	56	64	-	-	-	-	-	-	-	-	-	-
Nº 3	48	56	-	-	-	-	-	-	-	-	-	-
Nº 4	40	48	-	-	-	-	-	-	-	-	-	-
Nº 5	40	44	-	-	-	-	-	-	-	-	-	-
Nº 6	32	40	-	-	-	-	-	-	-	-	-	-
Nº 8	32	36	-	-	-	-	-	-	-	-	-	-
Nº10	24	32	-	-	28-36-40-48-56	-	-	-	-	-	-	-
Nº12	24	28	32	-	36-40-48-56	-	-	-	-	-	-	-
1/4	20	28	32	-	24-27-36-40-48-56	18	20	26	26	-	32	19
9/32	-	-	-	-	-	-	-	26	-	-	-	-
5/16	18	24	32	20-28	27-36-40-48	-	18	22	26	-	32	-
3/8	16	24	32	20-28	18-27-36-40	18	16	20	26	-	32	19
7/16	14	20	28	16-32	18-24-27	-	14	18	26	-	-	-
1/2	13	20	28	16-32	12-14-18-24-27	14	12	16	26	18	20	14
9/16	12	18	24	16-20-28-32	14-27	-	12	16	26	-	20	-
5/8	11	18	24	12-16-20-28-32	14-27	-	11	14	26	18	20	14
11/16	-	-	24	12-16-20-28-32	-	-	11	14	26	-	16-20	-
3/4	10	16	20	12-28-32	14-18-24-27	14	10	12	26	16	16-20	14
13/16	-	-	20	12-16-28-32	18	-	-	-	-	-	16-20-26	-
7/8	9	14	20	12-16-28-32	10-18-24-27	-	9	11	26	-	20	14
15/16	-	-	20	12-16-28-32	-	-	-	-	-	-	12-20	-
1	8	12	20	16-28-32	10-14-18-24-27	11 1/2	8	10	26	16	12-20	11
1 1/16	-	-	18	8-12-16-20-28	-	-	-	-	-	-	12-20	-
1 1/8	7	12	18	8-16-20-28	10-14-24	-	7	9	26	-	12-20	11
1 3/16	-	-	18	8-12-16-20-28	-	-	-	-	-	-	12-20	-
1 1/4	7	12	18	8-16-20-28	10-14-24	11 1/2	7	9	26	16	12-20	11
1 5/16	-	-	18	8-12-16-20-28	-	-	-	-	-	-	12-20	-
1 3/8	6	12	18	8-16-20-28	10-14-24	-	6	8	-	-	12-20	11
1 7/16	-	-	18	6-8-12-16-20-28	-	-	-	-	-	-	12-20	-
1 1/2	6	12	18	8-16-20-28	10-14-24	11 1/2	6	8	26	14	12-20	11
1 9/16	-	-	18	6-8-12-16-20	-	-	-	-	-	-	-	-
1 5/8	-	-	18	6-8-12-16-20	10-14-24	-	5	8	26	-	12-16-20	11
1 11/16	-	-	18	6-8-12-16-20	-	-	-	-	-	-	-	-
1 3/4	5	-	-	6-8-12-16-20	10-14-18	-	5	7	26	-	12-16-20	11
1 13/16	-	-	-	6-8-12-16-20	-	-	-	-	-	-	-	-
1 7/8	-	-	-	6-8-12-16-20	10-14-18	-	4 1/2	-	26	-	12-16-20	-
1 15/16	-	-	-	6-8-12-16-20	-	-	-	-	-	-	-	-
2	4 1/2	-	-	6-8-12-16-20	10-14-18	11 1/2	4 1/2	7	26	14	12-16-20	11
2 1/16	-	-	-	-	16	-	-	-	-	-	-	-
2 1/8	-	-	-	6-8-12-16-20	-	-	-	-	-	-	8-12-16	-
2 3/16	-	-	-	-	16	-	-	-	-	-	-	-
2 1/4	4 1/2	-	-	6-8-12-16-20	10-14-18	-	4	6	-	-	8-12-16	11
2 5/16	-	-	-	-	16	-	-	-	-	-	-	-
2 3/8	-	-	-	6-8-12-16-20	-	-	-	-	-	-	8-12-16	11
2 7/16	-	-	-	-	16	-	-	-	-	-	-	-
2 1/2	4	-	-	6-8-12-16-20	10-14-18	8	4	6	-	14	8-12-16	11
2 5/8	-	-	-	4-6-8-12-16-20	-	-	-	-	-	-	8-12-16	-
2 3/4	4	-	-	6-8-12-16-20	10-14-18	-	3 1/2	6	-	-	8-12-16	11
2 7/8	-	-	-	4-6-8-12-16-20	-	-	-	-	-	-	8-12-16	-
3	4	-	-	6-8-12-16-20	10-14-18	8	3 1/2	5	-	-	8-12-16	11



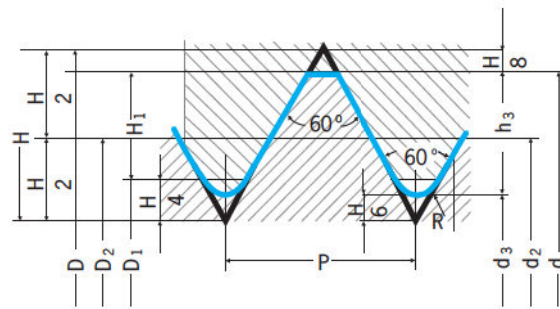
ROSCA UNIFICADA E AMERICANA Unified and American Screw Threads

BITOLA	FIOS p/ POL		CLASSE DE ROSCA				LIMITES DO DIÂMETRO EFETIVO				
	NC UNC	NF UNF	Class 2	Class 3	Class 2B	Class 3B	Min. (Basic)	Máx. Class 2	Máx. Class 3	Máx. Class 2B	Máx. Class 3B
0	-	80	GH1	GH1	GH2	GH1	.0519	.0536	.0532	.0542	.0536
1	64	-	GH1	GH1	GH2	GH1	.0629	.0648	.0643	.0655	.0648
1	-	72	GH1	GH1	GH2	GH1	.0640	.0658	.0653	.0665	.0659
2	56	-	GH1	GH1	GH2	GH1	.0744	.0764	.0759	.0772	.0765
2	-	64	GH1	GH1	GH2	GH1	.0759	.0778	.0773	.0786	.0779
3	48	-	GH1	GH1	GH2	GH1	.0855	.0877	.0871	.0885	.0877
3	-	56	GH1	GH1	GH2	GH1	.0874	.0894	.0889	.0902	.0895
4	40	-	GH2	GH1	GH2	GH2	.0958	.0982	.0975	.0991	.0982
4	-	48	GH1	GH1	GH2	GH1	.0985	.1007	.1001	.1016	.1008
5	40	-	GH2	GH1	GH2	GH2	.1088	.1112	.1105	.1121	.1113
5	-	44	GH1	GH1	GH2	GH1	.1102	.1125	.1118	.1134	.1126
6	32	-	GH2	GH1	GH3	GH2	.1177	.1204	.1196	.1214	.1204
6	-	40	GH2	GH1	GH2	GH2	.1218	.1242	.1235	.1252	.1243
8	32	-	GH2	GH1	GH3	GH2	.1437	.1464	.1456	.1475	.1465
8	-	36	GH2	GH1	GH2	GH2	.1460	.1485	.1478	.1496	.1487
10	24	-	GH3	GH1	GH3	GH3	.1629	.1662	.1653	.1672	.1661
10	-	32	GH2	GH1	GH3	GH2	.1697	.1724	.1716	.1736	.1726
12	24	-	GH3	GH1	GH3	GH3	.1889	.1922	.1913	.1933	.1922
12	-	28	GH3	GH1	GH3	GH3	.1928	.1959	.1950	.1970	.1959
1/4	20	-	GH3	GH2	GH5	GH3	.2175	.2211	.2201	.2223	.2211
1/4	-	28	GH3	GH1	GH4	GH3	.2268	.2299	.2290	.2311	.2300
5/16	18	-	GH3	GH2	GH5	GH3	.2764	.2805	.2794	.2817	.2803
5/16	-	24	GH3	GH1	GH4	GH3	.2854	.2887	.2878	.2902	.2890
3/8	16	-	GH3	GH2	GH5	GH3	.3344	.3389	.3376	.3401	.3387
3/8	-	24	GH3	GH1	GH4	GH3	.3479	.3512	.3503	.3528	.3516
7/16	14	-	GH5	GH3	GH5	GH3	.3911	.3960	.3947	.3972	.3957
7/16	-	20	GH3	GH1	GH5	GH3	.4050	.4086	.4076	.4104	.4091
1/2	13	-	GH5	GH3	GH5	GH3	.4500	.4552	.4537	.4565	.4548
1/2	-	20	GH3	GH1	GH5	GH3	.4675	.4711	.4701	.4731	.4717
9/16	12	-	GH5	GH3	GH5	GH3	.5084	.5140	.5124	.5152	.5135
9/16	-	18	GH3	GH2	GH5	GH3	.5264	.5305	.5294	.5323	.5308
5/8	11	-	GH5	GH3	GH5	GH3	.5660	.5719	.5702	.5732	.5714
5/8	-	18	GH3	GH2	GH5	GH3	.5889	.5930	.5919	.5949	.5934
3/4	10	-	GH5	GH3	GH5	GH5	.6850	.6914	.6895	.6927	.6907
3/4	-	16	GH3	GH2	GH5	GH3	.7094	.7139	.7126	.7159	.7143
7/8	9	-	GH6	GH4	GH6	GH4	.8028	.8098	.8077	.8110	.8089
7/8	-	14	GH4	GH2	GH6	GH4	.8286	.8335	.8322	.8356	.8339
1	8	-	GH6	GH4	GH6	GH4	.9188	.9264	.9242	.9276	.9254
1	-	12	GH4	GH2	GH6	GH4	.9459	.9515	.9499	.9535	.9516
1	-	14 NS	GH4	GH2	GH6	GH4	.9536	.9585	.9572	.9609	.9590
1 1/8	7	-	GH8	GH4	GH6	GH4	1.0322	1.0407	1.0381	1.0416	1.0393
1 1/8	-	12	GH4	GH4	GH6	GH4	1.0709	1.0765	1.0749	1.0787	1.0768
1 1/4	7	-	GH8	GH4	GH8	GH4	1.1572	1.1657	1.1631	1.1668	1.1644
1 1/4	-	12	GH4	GH4	GH6	GH4	1.1959	1.2015	1.1999	1.2039	1.2019
1 3/8	6	-	GH8	GH4	GH8	GH4	1.2667	1.2768	1.2738	1.2771	1.2745
1 3/8	-	12	GH4	GH4	GH6	GH4	1.3209	1.3265	1.3249	1.3291	1.3270
1 1/2	6	-	GH8	GH4	GH8	GH4	1.3917	1.4018	1.3988	1.4022	1.3996
1 1/2	-	12	GH4	GH4	GH6	GH4	1.4459	1.4515	1.4499	1.4542	1.4522

Os machos recomendados acima normalmente produzem a classe de rosca indicada na média dos materiais quando usados com cuidado. De qualquer forma se o macho especificado não der uma calibração satisfatória no trabalho é necessário a escolha de outro limite.

The above recommended taps normally produce the Class of Thread indicated in average materials when used with reasonable care. However if the tap specified does not give a satisfactory gage fit in the work, a choice of some other limit tap will be necessary

Rosca Métrica Grossa: ISO (DIN 13)



$$D_1 = d - 2H_1$$

$$d_2 = D_2 = d - 0,64953 P$$

$$d_3 = d - 1,22687 P$$

$$H = 0,86603 P$$

$$H_1 = 0,54127 P$$

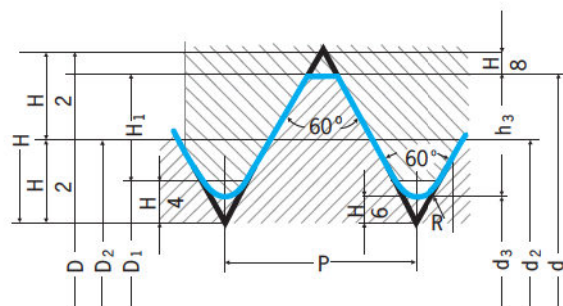
$$h_3 = 0,61343 P$$

$$R = \frac{H}{6} = 0,14434 P$$

d = D	Passo P	Diâmetro Efetivo d ₂ = D ₂	Diâmetro Menor		Altura do Filete		Raio R
			d ₃	D ₁	h ₃	H ₁	
M 1	0,25	0,838	0,693	0,729	0,153	0,135	0,036
M 1,1	0,25	0,938	0,793	0,829	0,153	0,135	0,036
M 1,2	0,25	1,038	0,893	0,929	0,153	0,135	0,036
M 1,4	0,3	1,205	1,032	1,075	0,184	0,162	0,043
M 1,6	0,35	1,373	1,170	1,221	0,215	0,189	0,051
M 1,8	0,35	1,573	1,370	1,421	0,215	0,189	0,051
M 2	0,4	1,740	1,509	1,567	0,245	0,217	0,058
M 2,2	0,45	1,908	1,648	1,713	0,276	0,244	0,065
M 2,5	0,45	2,208	1,948	2,013	0,276	0,244	0,065
M 3	0,5	2,675	2,387	2,459	0,307	0,271	0,072
M 3,5	0,6	3,110	2,764	2,850	0,368	0,325	0,087
M 4	0,7	3,545	3,141	3,242	0,429	0,379	0,101
M 4,5	0,75	4,013	3,580	3,688	0,460	0,406	0,108
M 5	0,8	4,480	4,019	4,134	0,491	0,433	0,115
M 6	1	5,350	4,773	4,917	0,613	0,541	0,144
M 7	1	6,350	5,773	5,917	0,613	0,541	0,144
M 8	1,25	7,188	6,466	6,647	0,767	0,677	0,180
M 9	1,25	8,188	7,466	7,647	0,767	0,677	0,180
M 10	1,5	9,026	8,160	8,376	0,920	0,812	0,217
M 11	1,5	10,026	9,160	9,376	0,920	0,812	0,217
M 12	1,75	10,863	9,853	10,106	1,074	0,947	0,253
M 14	2	12,701	11,546	11,835	1,227	1,083	0,289
M 16	2	14,701	13,546	13,835	1,227	1,083	0,289
M 18	2,5	16,376	14,933	15,294	1,534	1,353	0,361
M 20	2,5	18,376	16,933	17,294	1,534	1,353	0,361
M 22	2,5	20,376	18,933	19,294	1,534	1,353	0,361
M 24	3	22,051	20,319	20,752	1,840	1,624	0,433
M 27	3	25,051	23,319	23,752	1,840	1,624	0,433
M 30	3,5	27,727	25,706	26,211	2,147	1,894	0,505
M 33	3,5	30,727	28,706	29,211	2,147	1,894	0,505
M 36	4	33,402	31,093	31,670	2,454	2,165	0,577
M 39	4	36,402	34,093	34,670	2,454	2,165	0,577
M 42	4,5	39,077	36,479	37,129	2,760	2,436	0,650
M 45	4,5	42,077	39,479	40,129	2,760	2,436	0,650
M 48	5	44,752	41,866	42,587	3,067	2,706	0,722
M 52	5	48,752	45,866	46,587	3,067	2,706	0,722
M 56	5,5	52,428	49,252	50,046	3,374	2,977	0,794
M 60	5,5	56,428	53,252	54,046	3,374	2,977	0,794
M 64	6	60,103	56,639	57,505	3,681	3,248	0,866
M 68	6	64,103	60,639	61,505	3,681	3,248	0,866

Rosca Métrica DIN (Perfil DIN)							
M 1,7	0,35	1,473	1,246		0,227		0,04
M 2,3	0,4	2,040	1,780		0,260		0,04
M 2,6	0,45	2,308	2,016		0,292		0,05

Rosca Métrica Fina : ISO (DIN 13)



$$D_1 = d - 2H_1$$

$$d_2 = D_2 = d - 0,64953 P$$

$$d_3 = d - 1,22687 P$$

$$H = 0,86603 P$$

$$H_1 = 0,54127 P$$

$$h_3 = 0,61343 P$$

$$R = \frac{H}{6} = 0,14434 P$$

d = D	P	Diâmetro Efetivo $d_2 = D_2$	Diâmetro Menor		Altura do Filete		Raio R
			d_3	D_1	h_3	H_1	
M 1	0,2	0,870	0,755	0,783	0,123	0,108	0,029
M 1,1	0,2	0,970	0,855	0,883	0,123	0,108	0,029
M 1,2	0,2	1,070	0,955	0,983	0,123	0,108	0,029
M 1,4	0,2	1,270	1,155	1,183	0,123	0,108	0,029
M 1,6	0,2	1,470	1,355	1,383	0,123	0,108	0,029
M 1,8	0,2	1,670	1,555	1,583	0,123	0,108	0,029
M 2	0,25	1,838	1,693	1,729	0,153	0,135	0,036
M 2,2	0,25	1,038	1,893	1,929	0,153	0,135	0,036
M 2,5	0,35	2,273	2,071	2,121	0,215	0,189	0,051
M 3	0,35	2,773	2,571	2,621	0,215	0,189	0,051
M 3,5	0,35	3,273	3,071	3,121	0,215	0,189	0,051
M 4	0,35	3,773	3,571	3,621	0,215	0,189	0,051
M 4	0,5	3,675	3,387	3,459	0,307	0,271	0,072
M 4,5	0,5	4,175	3,887	3,959	0,307	0,271	0,072
M 5	0,5	6,675	4,387	4,459	0,307	0,271	0,072
M 5,5	5,5	5,175	4,887	4,959	0,307	0,271	0,072
M 6	0,5	5,675	5,387	5,459	0,307	0,271	0,072
M 6	0,75	5,513	5,080	5,188	0,460	0,406	0,108
M 7	0,75	6,513	6,080	6,188	0,460	0,406	0,108
M 8	0,5	7,675	7,387	7,459	0,307	0,271	0,072
M 8	0,75	7,513	7,080	7,188	0,460	0,406	0,108
M 8	1	7,350	6,773	6,917	0,613	0,541	0,144
M 9	0,75	8,513	8,080	8,188	0,460	0,406	0,108
M 9	1	8,350	7,773	7,917	0,613	0,541	0,144
M 10	0,5	9,675	9,387	9,459	0,307	0,271	0,072
M 10	0,75	9,513	9,080	9,188	0,460	0,406	0,108
M 10	1	9,350	8,773	8,917	0,613	0,541	0,144
M 10	1,25	9,188	8,466	8,647	0,767	0,677	0,180
M 11	0,75	10,513	10,080	10,188	0,460	0,406	0,108
M 11	1	10,350	9,773	9,917	0,613	0,541	0,144
M 12	0,75	11,513	11,080	11,188	0,460	0,406	0,108
M 12	1	11,350	10,773	10,917	0,613	0,541	0,144
M 12	1,25	11,188	10,466	10,647	0,767	0,677	0,180
M 12	1,15	11,026	10,160	10,376	0,920	0,812	0,217
M 13	1	12,350	11,773	11,917	0,613	0,541	0,144
M 14	1	13,350	12,773	12,917	0,613	0,541	0,144
M 14	1,25	13,188	12,466	12,647	0,767	0,677	0,180
M 14	1,5	13,026	12,160	12,376	0,920	0,812	0,217
M 15	1	14,350	13,773	13,917	0,613	0,541	0,144
M 15	1,5	14,026	13,160	13,376	0,620	0,812	0,217
M 16	1	15,350	14,773	14,917	0,613	0,541	0,144
M 16	1,5	15,026	14,160	14,376	0,920	0,812	0,217
M 17	1	16,350	15,773	15,917	0,613	0,541	0,144
M 17	1,5	16,026	15,160	15,376	0,920	0,812	0,217
M 18	1	17,350	16,773	16,917	0,613	0,541	0,144
M 18	1	17,026	16,160	16,376	0,920	0,812	0,217
M 18	2	16,701	15,546	15,835	1,227	1,0825	0,289
M 20	1	19,350	18,773	18,917	0,613	0,541	0,144
M 20	1,5	19,026	18,160	18,376	0,920	0,812	0,217
M 20	2	18,701	17,546	17,835	1,227	1,0825	0,289

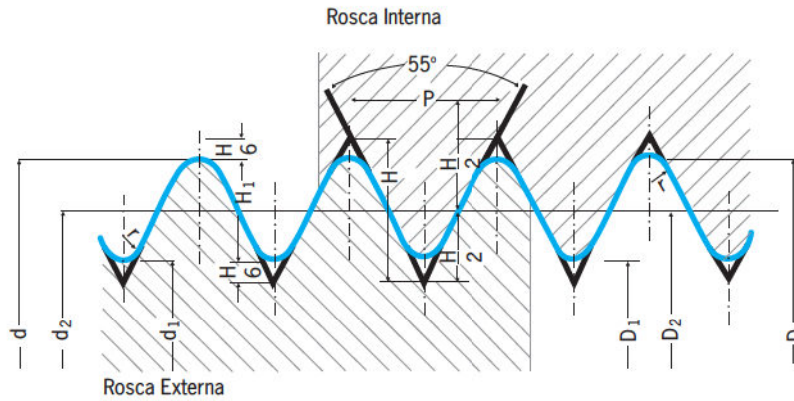


d = D	Passo P	Diâmetro Efetivo d ₂ = D ₂	Diâmetro Menor		Altura do Filete		Raio R
			d ₃	D ₁	h ₃	H ₁	
M 22	1	21,350	20,773	20,917	0,613	0,541	0,144
M 22	1,5	21,026	20,160	20,376	0,920	0,812	0,217
M 22	2	20,701	19,546	19,835	1,227	1,0825	0,289
M 24	1	23,350	22,773	22,917	0,613	0,541	0,144
M 24	1,5	23,026	22,160	22,376	0,920	0,812	0,217
M 24	2	22,701	21,546	21,835	1,227	1,0825	0,289
M 25	1	24,350	23,773	23,917	0,613	0,541	0,144
M 25	1,5	24,026	23,160	23,376	0,920	0,812	0,217
M 25	2	23,701	22,546	22,835	1,227	1,0825	0,289
M 26	1,5	25,026	24,160	24,376	0,920	0,812	0,217
M 27	1	26,350	25,773	25,917	0,613	0,541	0,144
M 27	1,5	26,026	25,160	25,376	0,920	0,812	0,217
M 27	2	25,701	24,546	24,835	1,227	1,0825	0,289
M 28	1	27,350	26,773	26,917	0,613	0,541	0,144
M 28	1,5	27,026	26,160	26,376	0,920	0,812	0,217
M 28	2	26,701	25,546	25,835	1,227	1,0825	0,289
M 30	1	29,350	28,773	28,917	0,613	0,541	0,144
M 30	1,5	29,026	28,160	28,376	0,920	0,812	0,217
M 30	2	28,701	27,546	27,835	1,227	1,0825	0,289
M 30	3	28,051	26,319	26,752	1,840	1,624	0,433
M 32	1,5	31,026	30,160	30,376	0,920	0,821	0,217
M 32	2	30,701	29,546	29,835	1,227	1,0825	0,289
M 33	1,5	32,026	31,160	31,376	0,920	0,812	0,217
M 33	2	31,701	30,546	30,835	1,227	1,0825	0,289
M 33	3	31,051	29,319	29,752	1,840	1,624	0,433
M 35	1,5	34,026	33,160	33,376	0,920	0,812	0,217
M 36	1,5	35,026	34,160	34,376	0,920	0,812	0,217
M 36	2	34,701	33,546	33,835	1,227	1,0825	0,289
M 36	3	34,051	32,319	32,752	1,840	1,624	0,433
M 38	1,5	37,026	36,160	36,376	0,920	0,812	0,217
M 39	1,5	38,026	37,160	37,376	0,920	0,812	0,217
M 39	2	37,701	36,546	36,835	1,227	1,0825	0,289
M 39	3	37,051	35,319	35,752	1,840	1,624	0,433
M 40	1,5	39,026	38,160	38,376	0,920	0,812	0,217
M 40	2	37,701	37,546	37,835	1,227	1,0825	0,289
M 40	3	38,051	36,319	36,752	1,840	1,624	0,433
M 42	1,5	41,026	40,160	40,376	0,920	0,812	0,217
M 42	2	40,701	39,546	39,835	1,227	1,0825	0,289
M 42	3	40,051	38,319	38,752	1,840	1,624	0,433
M 42	4	39,402	37,093	37,670	2,454	2,165	0,577
M 44	1,5	43,026	42,160	42,376	0,920	0,812	0,217
M 45	1,5	44,026	43,160	43,376	0,920	0,812	0,217
M 45	2	43,701	42,546	42,835	1,227	1,0825	0,289
M 45	3	43,051	41,319	41,752	1,840	1,624	0,433
M 48	1,5	47,026	46,160	46,376	0,920	0,812	0,217
M 48	2	46,701	45,546	45,835	1,227	1,0825	0,289
M 48	3	46,051	44,319	44,752	1,840	1,624	0,433
M 50	1,5	49,026	48,160	48,376	0,920	0,812	0,217
M 50	2	48,701	47,546	47,835	1,227	1,0825	0,289
M 50	3	48,051	46,319	46,752	1,840	1,624	0,433
M 52	1,5	51,026	50,160	50,376	0,920	0,812	0,217
M 52	2	50,701	49,546	49,835	1,227	1,0825	0,289
M 52	3	50,051	48,319	48,752	1,840	1,624	0,433
M 55	1,5	54,026	53,160	53,376	0,920	0,812	0,217
M 55	2	53,701	52,546	52,835	1,227	1,0825	0,289
M 55	3	53,051	51,319	51,752	1,840	1,624	0,433
M 56	1,5	55,026	54,160	54,376	0,920	0,812	0,217
M 56	2	54,701	53,546	53,835	1,227	1,0825	0,289
M 56	3	54,051	52,319	52,752	1,840	1,624	0,433
M 58	1,5	57,026	56,160	56,376	0,920	0,812	0,217
M 58	2	56,701	55,546	55,835	1,227	1,0825	0,289
M 58	3	56,051	54,319	54,752	1,840	1,624	0,433
M 60	1,5	59,026	58,160	58,376	0,920	0,812	0,217
M 60	2	58,701	57,546	57,835	1,227	1,0825	0,289
M 60	3	58,051	56,319	56,752	1,840	1,624	0,433

Rosca Métrica DIN (Perfil DIN)							
M 2,3	0,25	2,138	1,976	1,976	0,162	0,162	0,03
M 2,6	0,35	2,373	2,146	2,146	0,227	0,227	0,04



Rosca Whitworth Grossa : BS 84 (DIN 11)



$$P = \frac{25,400}{N}$$

$$r = 0,137 \ 329 \ P$$

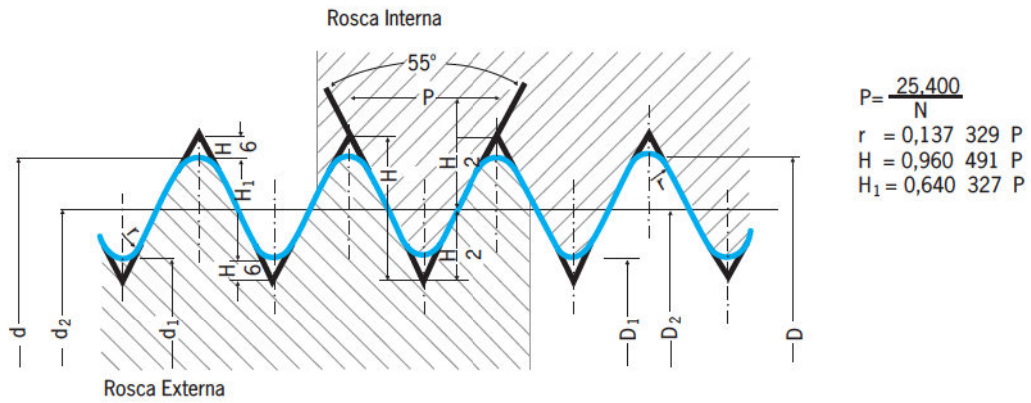
$$H = 0,960 \ 491 \ P$$

$$H_1 = 0,640 \ 327 \ P$$

d = D in	N/1"	Diâmetro Maior d = D	Diâmetro Efetivo d ₂ = D ₂	Diâmetro Menor d ₁ = D ₁	Altura do Filete H ₁	Raio R
1/16	60	1,588	1,317	1,046	0,270	0,058
3/32	48	2,381	2,042	1,704	0,388	0,072
1/8	40	3,175	2,768	2,362	0,406	0,087
5/32	32	3,969	3,461	2,952	0,507	0,108
3/16	24	4,762	4,084	3,407	0,677	0,145
7/32	24	5,556	4,879	4,201	0,677	0,145
1/4	20	6,350	5,537	4,724	0,813	0,174
5/16	18	7,938	7,034	6,130	0,904	0,194
3/8	16	9,525	8,509	7,493	1,017	0,218
7/16	14	11,113	9,950	8,788	1,162	0,249
1/2	12	12,700	11,345	9,990	1,355	0,291
5/8	11	15,875	14,396	12,917	1,479	0,317
3/4	10	19,050	17,424	15,798	1,627	0,349
7/8	9	22,225	20,418	18,611	1,807	0,388
1	8	25,400	23,367	21,334	2,033	0,436
1 1/8	7	28,575	26,252	23,929	2,324	0,498
1 1/4	7	31,750	29,427	27,104	2,324	0,498
1 3/8	6	34,925	32,214	29,503	2,711	0,581
1 1/2	6	38,100	35,389	32,678	2,711	0,581
1 5/8	5	41,275	38,022	34,769	3,253	0,698
1 3/4	5	44,450	41,197	37,944	3,253	0,698
1 7/8	4 1/2	47,625	44,011	40,397	3,614	0,775
2	4 1/2	50,800	47,186	43,572	3,614	0,775
2 1/4	4	57,150	53,084	49,018	4,066	0,872
2 1/2	4	63,500	59,434	55,368	4,066	0,872
2 3/4	3 1/2	69,850	65,203	60,556	4,647	0,997
3	3 1/2	76,200	71,553	66,906	4,647	0,997



Rosca Whitworth para Tubo: DIN 259 (BS 2779)



d = D in	N/1"	Diâmetro Maior d = D	Diâmetro Efetivo d₂ = D₂	Diâmetro Menor d₁ = D₁	Altura do Filete H₁	Raio R
G 1/8	28	9,728	9,147	8,566	0,581	0,125
G 1/4	19	13,157	12,301	11,445	0,856	0,184
G 3/8	19	16,662	15,806	14,950	0,856	0,184
G 1/2	14	20,955	19,793	18,631	1,162	0,249
(G 5/8)	14	22,911	21,749	20,587	1,162	0,249
G 3/4	14	26,441	25,279	24,117	1,162	0,249
(G 7/8)	14	30,201	29,039	27,877	1,162	0,249
G1	11	33,249	31,770	30,291	1,479	0,317
(G 1 1/8)	11	37,897	36,418	34,939	1,479	0,317
G 1 1/4	11	41,910	40,431	38,952	1,479	0,317
(G 1 3/8)	11	44,323	42,844	41,365	1,479	0,317
G 1 1/2	11	47,803	46,324	44,845	1,479	0,317
(G 1 3/4)	11	53,746	52,267	50,788	1,479	0,317
G 2	11	59,614	58,135	56,656	1,479	0,317
(G 2 1/4)	11	65,710	64,231	62,752	1,479	0,317
G 2 1/2	11	75,184	73,705	72,226	1,479	0,317
(G 2 3/4)	11	81,534	80,055	78,576	1,479	0,317
G 3	11	87,884	86,406	84,926	1,479	0,317
(G 3 1/4)	11	93,980	92,501	91,022	1,479	0,317
G 3 1/2	11	100,330	98,851	97,372	1,479	0,317
(G 3 3/4)	11	106,680	105,201	103,722	1,479	0,317
G 4	11	113,030	111,551	110,072	1,479	0,317
(G 4 1/2)	11	125,730	124,251	122,772	1,479	0,317
G 5	11	138,430	136,951	135,472	1,479	0,317
(G 5 1/2)	11	151,130	149,651	148,172	1,479	0,317
G 6	11	163,830	162,351	160,872	1,479	0,317

Tolerância do D₂ do Macho - DIN 802

D (mm)		P mm	μm							
Acima	Até		4H		6H		6G		7G	
0,99	1,4	0,2	+15	+3	+ 25	+15	-	-	-	-
		0,25	+17	+6	+ 28	+17	-	-	-	-
		0,3	+18	+6	+ 30	+18	-	-	-	-
1,4	2,8	0,2	+16	+6	+ 26	+16	-	-	-	-
		0,25	+18	+6	+ 30	+18	-	-	-	-
		0,35	+20	+6	+ 34	+20	-	-	-	-
		0,4	+21	+7	+ 35	+21	+ 49	+ 35	-	-
		0,45	+23	+8	+ 38	+23	+ 53	+ 38	-	-
2,8	5,6	0,35	+21	+6	+ 36	+21	-	-	-	-
		0,5	+24	+8	+ 40	+24	+ 56	+ 40	+ 72	+ 56
		0,6	+27	+9	+ 45	+27	+ 63	+ 45	+ 81	+ 63
		0,7	+29	+10	+ 48	+29	+ 67	+ 48	+ 86	+ 67
		0,75	+29	+10	+ 48	+29	+ 67	+ 48	+ 86	+ 67
		0,8	+30	+10	+ 50	+30	+ 70	+ 50	+ 90	+ 70
5,6	11,2	0,5	+27	+9	+ 45	+27	+ 63	+ 45	+ 81	+ 63
		0,75	+32	+11	+ 53	+32	+ 74	+ 53	+ 95	+ 74
		1	+35	+11	+ 59	+35	+ 83	+ 59	+107	+ 83
		1,25	+38	+13	+ 63	+38	+ 88	+ 63	+113	+ 88
11,2	22,4	1,5	+42	+14	+ 70	+42	+ 98	+ 70	+126	+ 98
		0,5	+29	+10	+ 48	+29	+ 67	+ 48	+ 86	+ 67
		0,75	+34	+12	+ 56	+34	+ 78	+ 56	+100	+ 78
		1	+38	+13	+ 63	+38	+ 88	+ 63	+113	+ 88
		1,25	+42	+14	+ 70	+42	+ 98	+ 70	+126	+ 98
		1,5	+45	+15	+ 75	+45	+105	+ 75	+135	+105
		1,75	+48	+16	+ 80	+48	+112	+ 80	+144	+112
22,4	45	2	+51	+17	+ 85	+51	+119	+ 85	+153	+119
		2,5	+54	+18	+ 90	+54	+126	+ 90	+162	+126
		0,5	+30	+10	+ 50	+30	+ 70	+ 50	+ 90	+ 70
		0,75	+36	+12	+ 60	+36	+ 84	+ 60	+108	+ 84
		1	+40	+14	+ 66	+40	+ 92	+ 66	+118	+ 92
		1,5	+48	+16	+ 80	+48	+112	+ 80	+144	+112
		2	+54	+18	+ 90	+54	+126	+ 90	+162	+126
		3	+64	+22	+106	+64	+148	+106	+190	+148
45	90	3,5	+67	+22	+112	+67	+157	+112	+202	+157
		4	+71	+24	+118	+71	+165	+118	+212	+165
		4,5	+75	+25	+125	+75	+175	+125	+225	+175
		0,5	+34	+12	+ 56	+34	+ 78	+ 56	+100	+ 78
		0,75	+38	+13	+ 63	+38	+ 88	+ 63	+113	+ 88
		1	+45	+15	+ 75	+45	+105	+ 75	+135	+105
		1,5	+51	+17	+ 85	+51	+119	+ 85	+153	+119
90	180	2	+57	+19	+ 95	+57	+133	+ 95	+171	+133
		3	+67	+22	+112	+67	+157	+112	+202	+157
		4	+75	+25	+125	+75	+175	+125	+225	+175
		5	+80	+27	+133	+80	+186	+133	+239	+186
		5,5	+84	+28	+140	+84	+196	+140	+252	+196
		6	+90	+30	+150	+90	+210	+150	+270	+210



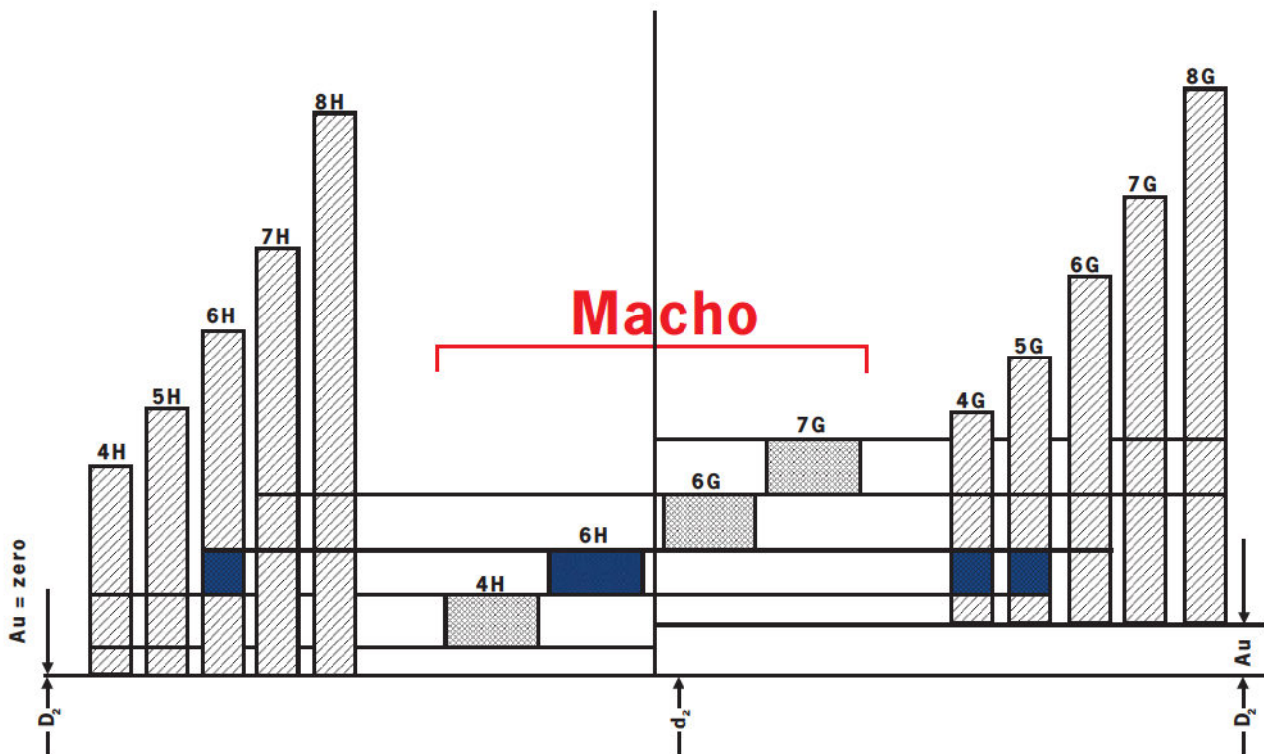
Gráfico do D₂

Rosca Interna

Rosca Interna

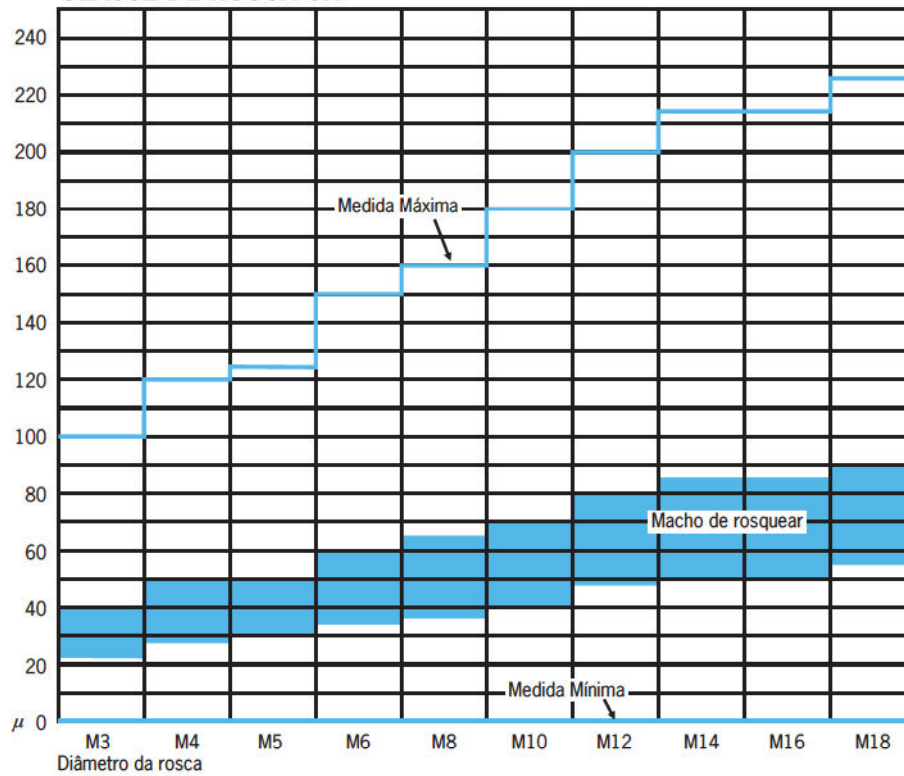
Posição de Tolerância H

Posição de Tolerância G

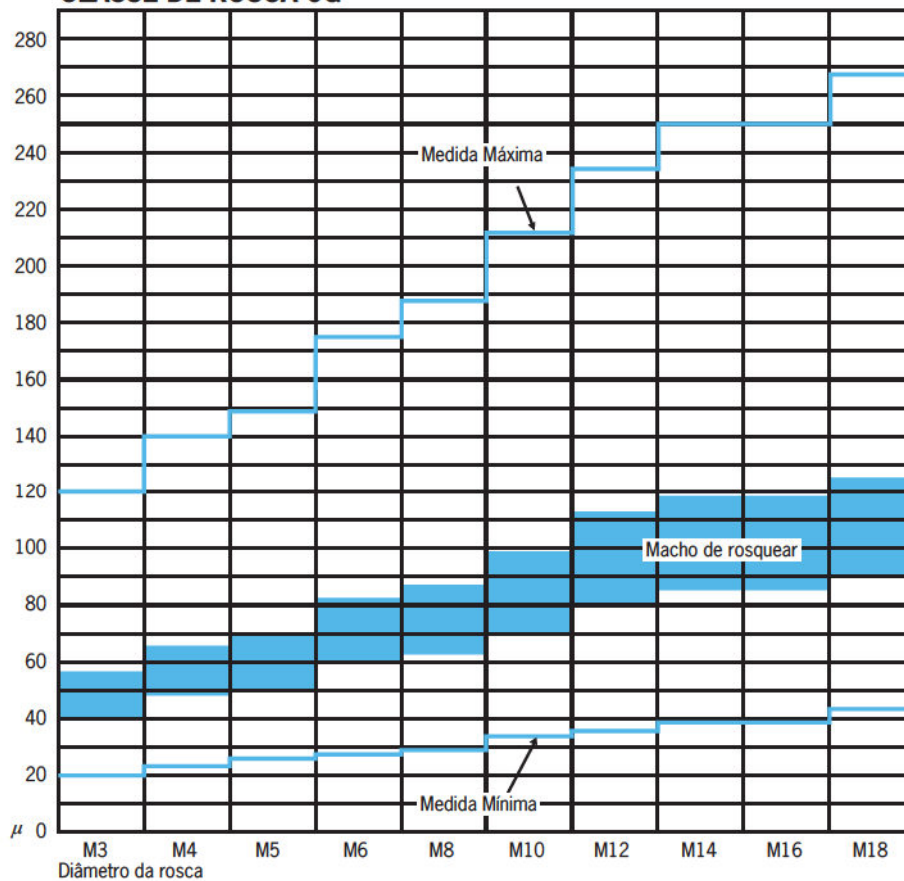


NOTA: Rosca M 1x0,25 P a M 1,4x0,3 P (inclusive) Tolerância Conforme Norma 4H.
MF 1x0,2 P a MF 2,2x0,25 P (inclusive) Tolerância Conforme Norma 4H.

CLASSE DE ROSCA 6H



CLASSE DE ROSCA 6G



M	Rosca Métrica Grossa	Metric Coarse thread
MF	Rosca Métrica Fina	Metric fine thread
NC	Rosca Nacional Americana série grossa	American National Coarse thread series
NF	Rosca Nacional Americana série fina	American National thread series
NEF	Rosca Nacional Americana série extra-fina	American National extra fine thread series
N	Rosca Nacional Americana série de passos 8-12 e 16 fios/pol.	American National 8-12 and 16-pitch thread series
NS	Rosca Nacional Americana especial	Special threads of American National form
UNC	Rosca Unificada série grossa	Unified coarse thread series
UNF	Rosca Unificada série fina	Unified fine thread series
UNEF	Rosca Unificada série extra-fina	Unified extra-fine thread series
UN	Rosca Unificada série de passos - 4,6,8,12, 16,20,28 e 32 fios/pol.	Unified - 4,6,8,12,16,20,28 and 32 pitch thread series
UNS	Rosca Unificada de diâmetro, passo e comprimento de acoplamento especiais	Unified threads of special diameters, Pitches, and lengths of engagement
BSW	Rosca Standard Inglesa Whitworth série grossa	British Standard Whitworth coarse thread series
BSF	Rosca Standard Inglesa série fina	British Standard fine thread series
Rc (BSP.Tr)	Rosca Standard Inglesa cônica para tubo	British Standard taper pipe thread
G (BSP)	Rosca Whitworth Cilindrica	Whitworth Straight pipe thread
Rp (BSP.Pℓ)	Rosca Standard Inglesa Cilindrica para Tubo	British Standard Straight pipe thread
WHIT	Rosca Standard Whitworth especial	Whitworth Standard special thread
BA	Rosca Standard da Associação Inglesa	British Association Standard thread
BSC	Rosca Standard Inglesa para bicicleta	British Standard cycle thread
BRASS	Rosca Inglesa para tubo de latão	British thread for brass pipe
NGO	Rosca Nacional Americana para saída de gases	American National gas outlet threads
*NPSC	Rosca Standard Americana cilíndrica para acoplamentos de tubos (macho gravado NPS)	American Standard straight pipe thread in coupling
NPSF	Rosca Standard Americana interna cilíndrica para tubos (Dryseal)	American Standard integral straight pipe thread (Dryseal)
NPSH	Rosca Standard Americana para acoplamento e união de tubos flexíveis	American Standard straight pipe thread for hose coupling and nipples

NPSI	Rosca Standard Americana intermediária interna cilíndrica para tubo (Dryseal)	American Standard intermediate internal straight pipe threada (dryseal)
NPSL	Rosca Standard Americana cilíndrica para porca de ajustamento e contraporca de tubulação	American Standard straight pipe thread for locknuts and locknuts-pipe threads
*NPSM	Rosca Standard Americana cilíndrica para junção mecânica (macho rosca retificada gravado NPS)	American Standard straight pipe thread for mechanical joints
NPT	Rosca Standard Americana cônica para tubo	American Standard taper pipe thread
NPTF	Rosca Standard Americana cônica para tubo (Dryseal)	American Standard taper pipe thread (Dryseal)
NPTR	Rosca Standard Americana cônica para tubo para conexão de corrimão	American Standard taper pipe thread for railing fittings
ANPT	Rosca para tubo especificada pelos Militares da Aeronáutica	Military Aeronautical Pipe Thread Specification
ACME	Rosca Acme Acme C - Para fins especiais Acme G - Para fins gerais	Acme threads Acme C - For special purposes Acme G - For general purposes
Tr.	Rosca Trapezoidal e ângulo 30° Rosca Acme Stub	Trapezoidal thread Stub Acme thread
N.Butt	Rosca Nacional Dente de Serra	National Buttress Screw Thread
Pg.	Rosca para tubo blindado	Conduit thread
Rd.	Rosca redonda	Round thread
NH	Rosca Nacional Americana para união de tubos flexíveis e mangueira de descarga	American National hose coupling and Fire hose coupling threads
NM	Rosca Nacional Miniatura	National Miniature Screw Thread
*NPS	Usado apenas na gravação do macho para roscar (veja NPSC, NPSM)	For tap marking only (see NPSC, NPSM)

Símbolos usados para classes de tolerância da rosca Unificada

Classe 1A - rosca externa
Classe 1B - rosca interna
Classe 2A - rosca externa
Classe 2B - rosca interna
Classe 3A - rosca externa
Classe 3B - rosca interna

Symbols used for the Tolerance Classes of the Unified Thread

Class 1A - external thread
Class 1B - internal thread
Class 2A - external thread
Class 2B - internal thread
Class 3A - external thread
Class 3B - internal thread

TABELA DE EQUIVALÊNCIA DE MATERIAIS

Material Symbol Chart by Standard

Descrição		JAPÃO	EUA		ALEMANHA	ISO							
		JIS	ASTM	AISI	DIN								
Aço estrutural geral 1.1.1		SM490A	C A B C 30 36 40 70 C D E A B 50W A B		St33 St52.3 US136								
		SM490B											
		SM570											
		SS400											
		SS330											
		SS490											
		SS540											
		SM490A											
		SM490A											
		SM490A											
		SM490A											
		SM520											
		SV330											
		SV400											
		Aço Carbono 1.2.1					C ~ 0.25%	S15C		1015	CK15	C15E4	
1.2.2	C ~ 0.25~0.45%		S25C	1025	C15 CK25 C25	C25 C25E4							
			1.2.3	C ~ 0.45%	S45C	1045 1046		CK45 C45					C45 C45E4
					S50C	1050		CK50 C50					C50 C50E4
Aço Liga 1.4.1			SCM415CK					18CrMo4 18CrMo4					
			SCM418										
		SCM418H											
		SCM430	4130										
		SCM430K											
		SCM432											
		SCM435	4135 4137				34CrMo4	34CrMo4					
		SCM435H	4135H 4137H				34CrMo4	34CrMo4					
		SCM435TK											
			4140 4142				42CrMo4						
		SCM440H	4140H 4142H				34CrMo4	34CrMo4					
		SCM440TK											
		SCM445	4145 4147										
		SCM445H	4145H										
		SCM822	4147H										
		SCM822H											
		SCr415						16MnCr5					
		SCr415H						16MnCr5					
SCr420			16MnCr5										
SCr420TK			16MnCr5										
SCr430	5130	34Cr4	34Cr4										

Descrição		JAPÃO	EUA		ALEMANHA	ISO		
		JIS	ASTM	AISI	DIN			
Aço Liga 1.4.1		SCr430H		5132 5130H 5132H	34Cr4	34Cr4		
		SCr435		5135	34Cr4 37Cr4	34Cr4 37Cr4		
		SCr435H		5135H	34Cr4 37Cr4	34Cr4 37Cr4		
		SCr440		5140	37Cr4 41Cr4	37Cr4 41Cr4		
		SCR440H		5140H	37Cr4 41Cr4	37Cr4 41Cr4		
		SCr445		5147				
		SMn420		1522		22Mn6		
		SMn420H		1522H		22Mn6		
		SMn433						
		SMn433h		1541H		36Mn6		
		SMn438		1541		36Mn6		
		SMn438H		1541H		36Mn6		
		SMn443						
		SMn443H		1541H		42Mn6		
		SCN815H				15NCr13		
		SCN836						
		SCNM220			8615 8617 8620 8622		20NiCrMo2	
				SNCM220H		8617H 8620H 8622H		20NiCrMo2
				SNCM240		8637 8640		41NiCrMo2
				SNCM415				
				SNCM420		4320		
				SNCM420H		4320H		
				SNCM431				
		SNCM439		4340				
Aço corte livre 1.4.2		SUM11		1110				
		SUM12		1108				
		SUM21		1212		9S20		
		SUM22		1213	9SMn28	11SMn28		
		SUM22L			9SMnPb28	11SMnPb28		
		SUM23		1215				
		SUM23L						
		SUM24L		12L14	9SMnPb28	11SMnPb28		
		SUM25			9SMn36	12SMn35		
		SUM31		117	15s10			
		SUM31L						
		SUM32						
		SUM41		1137				
		SUM42		1141				
SUM43		1144		44SMn28				
Aço Ferramenta 1.4.3		SK1				TC140		
		SK2				TC120		
		SK3	W1-111/2			TC105		
		SK4	W1-10		C105W1	TC90		
		SK5	W1-9			TC90		
		SK6	W1-8		C80W1 C80W1	TC80 TC70		
		SK7			C70W2			
		SKS2			105WCr6	105WCr1		
		SKT4			55NiCrMoV6	55NiCrMoV2		

TABELA DE EQUIVALÊNCIA DE MATERIAIS

Material Symbol Chart by Standard

Descrição	JAPÃO	EUA		ALEMANHA	ISO	
		JIS	ASTM	AISI		DIN
Aço para Molde 1.4.4	SKD11 SKS21 SKS31		D2			
Aço para Molde 1.4.4	SKS41 SKS43 SKS44 SKS51 SUJ2 SKD61		W2-91/2 W2-81/2 L6 52100 H13	105WCr6 100Cr9 X40CrMoV51	105WCr1 1 40CrMoV5	
Aço resistente ao calor 1.5.1	SUH36 SUH37 SUH38 SUH309 SUH310 SUH330 SUH409 SUH409L SUH446 SUH600 SUH616 SUH660 SUH661		S63008 S30900 S31000 N08330 S40900 S44600 S42200 S66286 R30155	 X6CrTi12	 1Ti H7	
Aço inoxidável 1.5.2	SUS304 SUS405 SUS420F SUS430 SUS440A SUS630 SUS631 SUS410			S30400 S40500 S42020 S43000 S44002 S17400 S17700 S41000	X5CrNi810 X6CrAl13 X6Cr17 X7CrNiAl177 X10Cr13	11 2 8 1 2 3
Aço fundido 1.6.1	SCH15		HT			
Ferro fundido 2.1.1	FC100 FC150			A-48-20B A-48-25B	GG10 GG15	
Ferro fundido ductil 2.1.2	FC200 FC250 FC300 FC350 FCD400 FCD500 FCD600		40 45 60-40-18 65-45-12 80-55-06	A-48-30B A-48-40B A-48-45B A-48-50B	GG20 GG25 GG30 GG35 GGG40 GGG50 GGG60	
Liga de alumínio fundido 3.1.4	AC1A AC1B AC2A AC2B AC3A AC4A AC4B AC4C AC4CH AC4D AC5A AC7A AC7B ADC1 ADC3 ADC5 ADC6 ADC10 ADC10Z		295 204.0 319.0 333.0 356.0 A356.0 355.0 242.0 514.0 520.0 A413.0 A360.0 518.0 A380.0 A380.0		G(GK)AlCu4Ti G(GK)AlCu4TiMga G(GK)AlSi2 G(GK)AlSi10Mg G(GK)AlCu3 G(GK)AlSi7Mg G(GK)AlMg5 GD-AlSi12(Cu) GD-AlSi10Mg GD-AlMg9 GD-AlSi9Cu GD-AlSi9Cu	AlCu4TiMgTi Al-Si5Cu3 Al-Si6Cu4 AlSi2 AlSi10Mg AlSi7Mg AlSi7Mg AlSi5Cu1Mg Al-Cu4Ni2Mg2 AlMg10 Al-Si12CuFe Al-Si8Cu3Fe Al-Si9Cu3Fe

Descrição		JAPÃO	EUA		ALEMANHA	ISO
		JIS	ASTM	AISI	DIN	
Cobre		C1020B	C10200(B187:94)		OF-Cu	Cu-OF
Cobre fundido 3.1.5		C1020P	C10200(B152:94)		OF-Cu	Cu-OF
		C1020R	C10200(B159:94)		OF-Cu	Cu-OF
Latão		C2600B	C26000(B36:95)		CuZn30 17660:83	426/1:83 CuZn30
Latão fundido 3.1.6		C2600P	C26000(B36:95)		CuZn30 17660:83	426/1:83 CuZn30
		C2600R	C26000(B36:95)		CuZn30 17660:83	426/1:83 CuZn30
		C2600T	C26000(B135:95)		CuZn30 17670:83	
		C2600W	C26000(B134:93)		CuZn30	CuZn30
Bronze		C6140 P	C61400(B169:95)			428:83 CuAl 8Fe3
Bronze fundido 3.1.7						
Liga de Alumínio 3.2.1		A1080			A199.8	
		A1070			A199.7	
Alumínio laminado 3.2.2		A1050			A199.5	A199.5
		A1100	1100			A199.0Cu
		A1200			A199	A199.0Cu
		A2014	2014		AlCuSiMn	Al-Cu4SiMg
		A2017			AlCuMg1	Al-Cu4SiMg
		A2017	2014		AlCuSiMn	Al-Cu4SiMg
		A2024BD	2024		AlCuMg2	AlCu4Mg1
		A2024BE	2024		AlCuMg2	AlCu4Mg1
		A2024P	2024		EN AW-2024	AlCu4Mg1
		A2024S	2024		AlCuMg2	AlCu4Mg1
		A2024TD	2024		AlCuMg2	
		A2024TE	2024		AlCuMg2	AlCu4Mg1
		A2024W	2024		AlCuMg2	AlCu4Mg1
		A3003	3003			
		A5052BD	5052		AlMg2.5	AlMg2.5
		A5052BE	5052			
		A5052FH				
		A5052P	5052		en aw-5052	AlMg2.5
		A5052S	5052			
		A5052TD	5052			AlMg2.5
		A5052TE	5052			
		A5052W	5052		AlMg2.5	AlMg2.5
		A5056			AlMg5	
		A5083	5083		AlMg4.5Mn	AlMg4.5Mn0.7
		A6061	6061			Al-Mg1SiCu
		A6063	6063			Al-Mg0.7Si
		A7075BD	7075		AlZnMgCu1.5	AlZn5.5MgCu
		A7075BE	7075		AlZnMgCu1.5	AlZn5.5MgCu
	A7075FD	7075		AlZnMgCu1.5		
	A7075BFH	7075		AlZnMgCu1.5		
	A7075P	7075		EN AW-7075	AlZn5.5MgCu	
	A7075S	7075		AlZnMgCu1.5	AlZn5.5MgCu	
	A7075TD	7075		AlZnMgCu1.5	AlZn5.5MgCu	
	A7075TE	7075		AlZnMgCu1.5	AlZn5.5MgCu	
Liga de Magnésio 3.2.3		MD1A	AZ91A		DG-MgAl9Zn1	
		MD1B	AZ91B		DG-MgAl9Zn1	
		MD1D	AZ91D			
			AZ60A			
			AZ60B			
			AZ41A			
		MB3	AZ80A		MgAl8Zn	MgAl8Zn
			AM20A			
			AM50A			
		MD2B	AM60B			
			AS22A			
			AS41B			
			AE42A			



Descrição		JAPÃO	EUA		ALEMANHA	ISO
		JIS	ASTM	AISI	DIN	
Liga de zinco 3.2.4		ZDC1	AC41A		GD-ZnAl4Cu1	ZnAl4Cu1
Liga de Titânio 3.3.1		ZDC2	AG40A		GD-ZnAl4	ZnAl4
			Ti-5Al-2.5Sn		Ti Al 4 Mn4	
			Ti-5Al-4V		TiAl 5 Sn 2	
Plástico Termocura 4.1.1.		Baquelite				
Termo plástico 4.1.2		Phenol				
		Nylon				
		Acrílico				

DESCRIÇÃO	Nº
Aço Estrutural Geral	1 1 1
Aço Carbono	1 2 0
Baixo Teor de Carbono C= ~ 0,25%	1 2 1
Médio Teor de Carbono C= 0,25 ~ 0,45%	1 2 2
Alto Teor de Carbono C= ~ 0,45%	1 2 3
Aço Temperado ~ 25 HRC	1 3 1
Aço Forjado 25 ~ 45 HRC	1 3 2
Aço Liga	1 4 1
Aço de Corte Livre	1 4 2
Aço Ferramenta	1 4 3
Aço para Molde	1 4 4
Aço Mola	1 4 5
Aço Resistente ao Calor	1 5 1
Aço Inoxidável	1 5 2
Aço Fundido	1 6 1
Ferro Fundido Cinzento	2 1 1
Ferro Fundido Dúctil	2 1 2
Liga de Alumínio Fundido	3 1 4
Cobre	3 1 5
Latão	3 1 6
Bronze	3 1 7
Liga de Alumínio	3 2 1
Alumínio Laminado	3 2 2
Liga de Magnésio	3 2 3
Liga de Zinco	3 2 4
Liga de Titânio	3 3 1
Plástico Termocura	4 1 1
Termo Plástico	4 1 2