ISO Metric Threads / Limiting Sizes for Coarse Threads Nominal

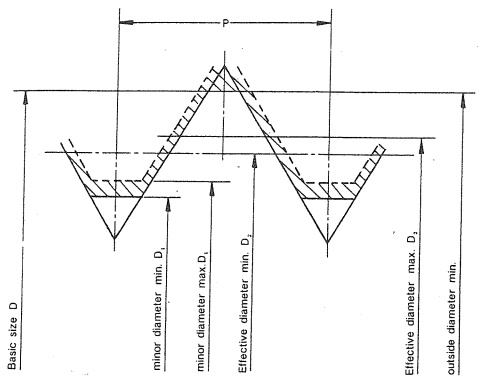

Fig 1. Nut thread in tolerance position H

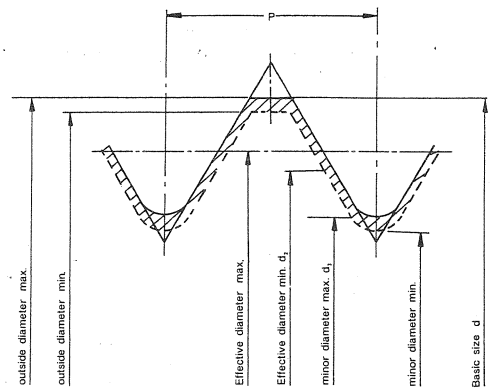

Fig 2. Bolt thread in tolerance position h

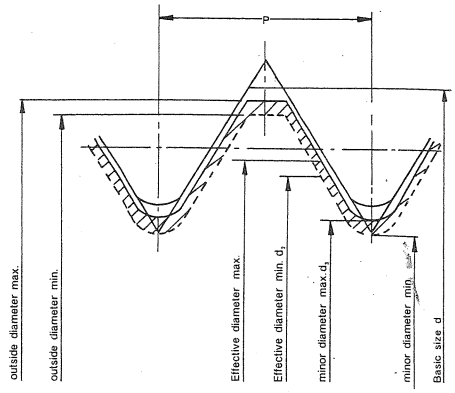

Fig 3. Bolt thread in tolerance position g and e

unit: mm

Nominal thread diameter d=D	pitch p	NUT thread						BOLT thread						
		Tolerance zone	Outside diameter D	Effective diameter D_2		Minor diameter D_1		Tolerance zone	Outside diameter D		Effective diameter D_2		Minor diameter D_1	
			min.	min.	max.	min.	max.		max.	min.	max.	min.	max.	min.
4	0.7	5H	4	3.545	3.640	3.242	3.382	4h	4	3.910	3.545	3.489	3.141	3.035
		6H	4	3.545	3.663	3.242	3.422	6g	3.978	3.838	3.523	3.433	3.119	2.979
		7H	4	3.545	3.695	3.242	3.466	6e	3.944	3.804	3.489	3.399	3.085	2.945
6	1	5H	6	5.350	5.468	4.917	5.107	4h	6	5.888	5.350	5.279	4.773	4.630
		6H	6	5.350	5.500	4.917	5.153	6g	5.974	5.794	5.324	5.212	4.747	4.563
		7H	6	5.350	5.540	4.917	5.217	8g	5.974	5.694	5.324	5.144	4.747	4.495
								6e	5.940	5.760	5.290	5.178	4.713	4.529
8	1.25	5H	8	7.188	7.313	6.647	6.859	4h	8	7.868	7.188	7.113	6.466	6.301
		6H	8	7.188	7.348	6.647	6.912	6g	7.972	7.760	7.160	7.042	6.438	6.230
		7H	8	7.188	7.388	6.647	6.982	8g	7.972	7.637	7.160	6.970	6.438	6.158
								6e	7.937	7.725	7.125	7.007	6.403	6.195
								8e	7.937	7.602	7.125	6.935	6.403	6.123
10	1.5	5H	10	9.026	9.166	8.376	8.612	4h	10	9.850	9.026	8.941	8.160	7.967
		6H	10	9.026	9.206	8.376	8.676	6g	9.968	9.732	8.994	8.862	8.128	7.888
		7H	10	9.026	9.250	8.376	8.751	8g	9.968	9.593	8.994	8.782	8.128	7.808
								6e	9.933	9.697	8.959	8.827	8.093	7.853
								8e	9.933	9.558	8.959	8.747	8.093	7.773
12	1.75	5H	12	10.863	11.023	10.106	10.371	4h	12	11.830	10.863	10.768	9.853	9.632
		6H	12	10.863	11.063	10.106	10.441	6g	11.966	11.701	10.829	10.679	9.819	9.543
		7H	12	10.863	11.113	10.106	10.531	8g	11.966	11.541	10.829	10.593	9.819	9.457
								6e	11.929	11.664	10.792	10.642	9.782	9.506
								8e	11.929	11.504	10.792	10.556	9.782	9.420
14	2	5H	14	12.701	12.871	11.835	12.135	4h	14	13.820	12.701	12.601	11.546	11.302
		6H	14	12.701	12.913	11.835	12.210	6g	13.962	12.682	12.663	12.503	11.508	11.204
		7H	14	12.701	12.966	11.835	12.310	8g	13.962	13.512	12.663	12.413	11.508	11.114
								6e	13.929	13.649	12.630	12.470	11.475	11.171
								8e	13.929	13.479	12.630	12.380	11.475	11.081
16	2	5H	16	14.701	14.871	13.835	14.135	4h	16	15.820	14.701	14.601	13.546	13.302
		6H	16	14.701	14.913	13.835	14.210	6g	15.962	15.682	14.663	14.503	13.508	13.204
		7H	16	14.701	14.966	13.835	14.310	8g	15.962	15.512	14.663	14.413	13.508	13.114
								6e	15.929	15.649	14.630	14.470	13.475	13.171
								8e	15.929	15.479	14.630	14.380	13.475	13.081
18	2.5	5H	18	16.376	16.556	15.294	15.649	4h	18	17.788	16.376	16.270	14.933	14.647
		6H	18	16.376	16.600	15.294	15.744	6g	17.958	17.623	16.334	16.164	14.891	14.541
		7H	18	16.376	16.656	15.294	15.854	8g	17.958	17.428	16.334	16.069	14.891	14.446
								6e	17.920	17.585	16.296	16.126	14.853	14.503
								8e	17.920	17.390	16.296	16.031	14.853	14.408
20	2.5	5H	20	18.376	18.556	17.294	17.649	4h	20	19.788	18.376	18.270	16.933	16.647
		6H	20	18.376	18.600	17.294	17.744	6g	19.958	19.623	18.334	18.164	16.891	16.541
		7H	20	18.376	18.656	17.294	17.854	8g	19.958	19.428	18.334	18.069	16.891	16.446
								6e	19.920	19.585	18.296	18.126	16.853	16.503
								8e	19.920	19.390	18.296	18.031	16.853	16.408
22	2.5	5H	22	20.376	20.556	19.294	19.649	4h	22	21.788	20.376	20.270	18.933	18.647
		6H	22	20.376	20.600	19.294	19.744	6g	21.958	21.623	20.334	20.164	18.891	18.541
		7H	22	20.376	20.656	19.294	19.854	8g	21.958	21.428	20.334	20.069	18.891	18.446
								6e	21.920	21.585	20.296	20.126	18.853	18.503
								8e	21.920	21.390	20.296	20.031	18.853	18.408
24	3	5H	24	22.051	22.263	20.752	21.152	4h	24	23.764	22.051	21.926	20.319	19.978
		6H	24	22.051	22.316	20.752	21.252	6g	23.952	23.577	22.003	21.803	20.271	19.855
		7H	24	22.051	22.386	20.752	21.382	8g	23.952	23.352	22.003	21.688	20.271	19.740
								6e	23.915	23.540	21.966	21.766	20.234	19.818
								8e	23.915	23.315	21.966	21.651	20.234	19.703
27	3	5H	27	25.051	25.263	23.752	24.152	4h	27	26.764	25.051	24.926	23.319	22.978
		6H	27	25.051	25.316	23.752	24.252	6g	26.952	26.577	25.003	24.803	23.271	22.855
		7H	27	25.051	25.386	23.752	24.382	8g	26.952	26.352	25.003	24.688	23.271	22.740
								6e	26.915	26.540	24.966	24.766	23.234	22.818
								8e	26.915	26.315	24.966	24.651	23.234	22.703
30	3.5	5H	30	27.727	27.951	26.211	26.661	4h	30	29.735	27.727	27.595	25.706	25.322
		6H	30	27.727	28.007	26.211	26.771	6g	29.947	29.522	27.674	27.462	25.653	25.189
		7H	30	27.727	28.082	26.211	26.921	8g	29.947	29.277	27.674	27.339	25.653	25.066
								6e	29.910	29.485	27.637	27.425	26.616	25.152
								8e	29.910	29.240	27.637	27.302	25.616	25.029

Diameters with Commonly used Tolerance Zones

unit: mm

Nominal thread diameter d=D	pitch p	NUT thread						BOLT thread						
		Tolerance zone	Outside diameter D	Effective diameter D_2		Minor diameter D_1		Tolerance zone	Outside diameter D		Effective diameter D_2		Minor diameter D_1	
			min.	min.	max.	min.	max.		max.	min.	max.	min.	max.	min.
33	3.5	5H	33	30.727	30.951	29.211	29.661	4h	33	32.735	30.727	30.595	28.706	28.322
		6H	33	30.727	31.007	29.211	29.771	6g	32.947	32.522	30.674	30.462	28.653	28.189
		7H	33	30.727	31.082	29.211	29.921	8g	32.947	32.277	30.674	30.339	28.653	28.066
								6e	32.910	32.485	30.637	30.425	28.616	28.152
								8e	32.910	32.240	30.637	30.302	28.616	28.029
36	4	5H	36	33.402	33.638	31.670	32.145	4h	36	35.700	33.402	33.262	31.093	30.665
		6H	36	33.402	33.702	31.670	32.270	6g	35.940	35.465	33.342	33.118	31.033	30.521
		7H	36	33.402	33.777	31.670	32.420	8g	35.940	35.190	33.342	32.987	31.033	30.390
								6e	35.905	35.430	33.307	33.083	30.998	30.486
								8e	35.905	35.155	33.307	32.952	30.998	30.355
39	4	5H	39	36.402	36.638	34.670	35.145	4h	39	38.700	36.402	36.262	34.093	33.665
		6H	39	36.402	36.702	34.670	35.270	6g	38.940	38.465	36.342	38.118	34.033	33.521
		7H	39	36.402	36.777	34.670	35.420	8g	38.940	38.190	36.342	35.987	34.033	33.390
								6e	38.905	38.430	36.307	36.083	33.998	33.486
								8e	38.905	38.155	36.307	35.952	33.998	33.355
42	4.5	5H	42	39.077	39.327	37.129	37.659	4h	42	41.685	39.077	38.927	36.479	36.005
		6H	42	39.077	39.392	37.129	37.799	6g	41.937	41.437	39.014	38.778	36.416	35.856
		7H	42	39.077	39.477	37.129	37.979	8g	41.937	41.137	39.014	38.639	36.416	35.717
								6e	41.900	41.400	38.977	38.741	36.379	35.819
								8e	41.900	41.100	38.977	38.602	36.379	35.680
45	4.5	5H	45	42.077	42.327	40.129	40.659	4h	45	44.685	42.077	41.927	39.479	39.005
		6H	45	42.077	42.392	40.129	40.799	6g	44.937	44.437	42.014	41.778	39.416	38.856
		7H	45	42.077	42.477	40.129	40.979	8g	44.937	44.137	42.014	41.639	39.416	38.717
								6e	44.900	44.400	41.977	41.741	39.379	38.819
								8e	44.900	44.100	41.977	41.602	39.379	38.680
48	5	5H	48	44.752	45.017	42.587	43.147	4h	48	47.665	44.752	44.592	41.866	41.346
		6H	48	44.752	45.087	42.587	43.297	6g	47.929	47.399	44.681	44.431	41.795	41.185
		7H	48	44.752	45.177	42.587	43.487	8g	47.929	47.079	44.681	44.281	41.795	41.035
								6e	47.894	47.364	44.646	44.396	41.760	41.150
								8e	47.894	47.044	44.646	44.246	41.760	41.000
52	5	5H	52	48.752	48.017	46.587	47.147	4h	52	51.665	48.752	48.592	45.866	45.346
		6H	52	48.752	49.087	46.587	47.297	6g	51.929	51.399	48.681	48.431	45.795	45.185
		7H	52	48.752	49.177	46.587	47.487	8g	51.929	51.079	48.681	48.281	45.795	45.035
								6e	51.894	51.364	48.646	48.396	45.760	45.150
								8e	51.894	51.044	48.646	48.246	45.760	45.000
56	5.5	5H	56	52.428	52.708	50.046	50.646	4h	56	55.645	52.428	52.268	49.252	48.686
		6H	56	52.428	52.783	50.046	50.796	6g	55.925	55.365	52.353	52.088	49.177	48.516
		7H	56	52.428	52.878	50.046	50.996	8g	55.925	55.025	52.353	51.928	49.177	48.356
								6e	55.888	55.328	52.316	52.151	49.140	48.479
								8e	55.888	54.988	52.316	51.891	49.140	48.319
60	5.5	5H	60	56.428	56.708	54.046	54.646	4h	60	59.645	56.428	56.258	53.252	52.686
		6H	60	56.428	56.783	54.046	54.796	6g	59.925	59.365	56.353	56.088	53.177	52.516
		7H	60	56.428	56.878	54.046	54.996	8g	59.925	59.025	56.353	55.928	53.177	52.356
								6e	59.888	59.328	56.316	56.151	53.140	52.479
								8e	59.888	58.988	56.316	55.891	53.140	52.319
64	6	5H	64	60.103	60.403	57.505	58.135	4h	64	63.625	60.103	59.923	56.639	56.027
		6H	64	60.103	60.478	57.505	58.305	6g	63.920	63.320	60.023	59.743	56.559	55.847
		7H	64	60.103	60.578	57.505	58.505	8g	63.920	62.970	60.023	59.573	56.559	55.677
								6e	63.882	63.282	59.985	59.705	56.521	55.809
								8e	63.882	62.932	59.985	59.535	56.521	55.639
68	6	5H	68	64.103	64.403	61.505	62.135	4h	68	67.625	64.103	63.923	60.639	60.027
		6H	68	64.103	64.478	61.505	62.305	6g	67.920	67.320	64.023	63.743	60.559	59.847
		7H	68	64.103	64.578	61.505	62.505	8g	67.920	66.970	64.023	63.573	60.559	59.677
								6e	67.882	67.282	63.985	63.705	60.521	59.809
								8e	67.882	66.932	63.985	63.535	60.521	59.639
70	6	5H	70.000	66.103	66.403	63.505	64.135	4h	70.000	69.625	66.103	65.923	62.639	62.027
		6H	70.000	66.103	66.478	63.505	64.305	6g	69.920	69.320	66.023	65.743	62.539	61.847
		7H	70.000	66.103	66.578	63.505	64.505	8g	69.920	68.970	66.023	65.573	62.539	61.677
72	6	5H	72.000	68.103	68.403	65.505	66.135	4h	72.000	71.625	68.103	67.923	64.639	64.027
		6H	72.000	68.103	68.478	65.505	66.305	6g	71.920	71.320	68.023	67.743	64.559	63.847
		7H	72.000	68.103	68.578	65.505	66.505	8g	71.920	70.970	68.023	67.573	64.559	63.677
76	6	5H	76.000	72.103	72.403	69.505	70.135	4h	76.000	76.625	72.103	71.923	68.639	68.027
		6H	76.000	72.103	72.478	69.505	70.305	6g	75.920	75.320	72.023	71.743	68.559	67.847
		7H	76.000	72.103	72.578	69.505	70.505	8g	75.920	74.970	72.023	71.573	68.559	67.677
80	6	5H	80.000	76.103	76.403	73.505	74.135	4h	80.000	79.625	76.103	75.923	72.639	72.027
		6H	80.000	76.103	76.478	73.505	74.305	6g	79.920	79.320	76.023	75.743	72.559	71.847
		7H	80.000	76.103	76.578	73.505	74.505	8g	79.920	78.970	76.023	75.573	72.559	71.677
85	6	5H	85.000	81.103	81.403	78.505	79.135	4h	85.000	84.625	81.103	80.923	77.639	77.027
		6H	85.000	81.103	81.478	78.505	79.305	6g	84.920	84.320	81.023	80.743	77.559	76.847
		7H	85.000	81.103	81.578	78.505	79.505	8g	84.920	83.970	81.023	80.573	77.559	76.677
90	6	5H	90.000	86.103	86.403	83.505	84.135	4h	90.000	89.625	86.103	85.923	82.639	82.027
		6H	90.000	86.103	86.478	83.505	84.305	6g	89.920	89.320	86.023	85.743	82.559	81.847
		7H	90.000	86.103	86.578	83.505	84.505	8g	89.920	88.970	86.023	85.573	82.559	81.677
95	6	5H	95.000	91.103	91.418	88.505	89.135	4h	95.000	94.625	91.103	90.913	87.639	87.017
		6H	95.000	91.103	91.503	88.505	89.305	6g	94.920	94.320	91.023	90.723	87.559	86.827
		7H	95.000	91.103	91.603	88.505	89.505	8g	94.920	93.970	91.023	90.548	87.559	86.652
100	6	5H	100.000	96.103	96.418	93.505	94.135	4h	100.000	99.625	96.103	95.913	92.639	92.017
		6H	100.000	96.103	96.503	93.505	94.305	6g	99.920	99.320	96.023	95.723	92.559	91.827
		7H	100.000	96.103	96.603	93.505	94.505	8g	99.920	98.970	96.023	95.548	92.559	91.652
105	6	5H	105.000	101.103	101.418	98.505	99.135	4h	105.000	104.625	101.103	100.913	99.639	97.017
		6H	105.000	101.103	101.503	98.505	99.305	6g	104.920	104.320	101.023	100.723	97.559	96.827
		7H	105.000	101.103	101.603	98.505	99.505	8g	104.920	103.970	101.023	100.548	97.559	96.652

American National Standard Unified inch Screw Threads

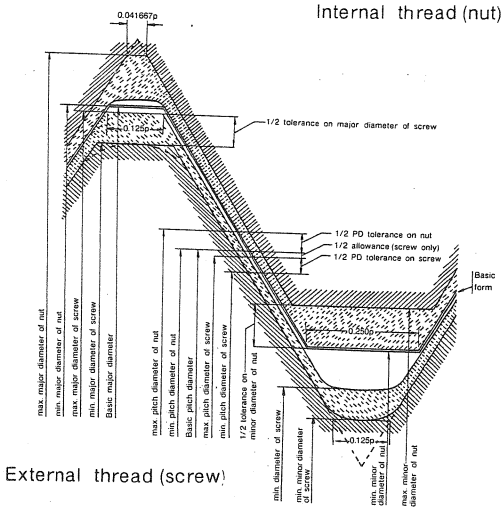

Fig 1. Disposition of tolerances, allowance and crest clearances for unified screw thread classes 1A, 2A, 1B and 2B

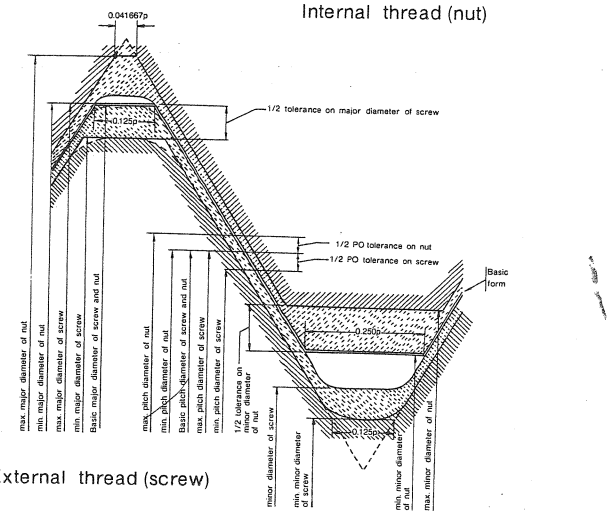

Fig 2. Disposition of tolerances and crest clearances for unified inch screw thread classes 3A and 3B

unit: mm

Nominal Size (in) and Threds per in	Series Desig-nation	Metric Equivalents		External								Internal						
				Class	Allow-ance	Major Diameter			Pich Diameter			Minor Diame-ter	Class	Minor Diameter		Pich Diameter			Major Diameter
		Diameter	Pitch			max.b	min.	min.d	max.b	min.	Toler-ance			min.	max.	min.	max.	Toler-ance	min.
1/4-20or 0.250-20	UNC	6.350	1.270	1A	0.029	6.322	6.013	—	5.496	5.355	0.141	4.765	1B	4.979	5.257	5.525	5.709	0.184	6.350
				2A	0.029	6.322	6.117	6.013	5.496	5.403	0.093	4.765	2B	4.979	5.257	5.525	5.648	0.123	6.350
				3A	0.000	6.350	6.145	—	5.524	5.454	0.070	4.792	3B	4.979	5.250	5.525	5.615	0.090	6.350
3/8-16or 0.375-16	UNC	9.525	1.588	1A	0.034	9.491	9.132	—	8.460	8.296	0.164	7.543	1B	7.798	8.153	8.494	8.709	0.215	9.525
				2A	0.034	9.491	9.254	9.132	8.460	8.349	0.111	7.543	2B	7.798	8.153	8.494	8.638	0.144	9.525
				3A	0.000	9.525	9.287	—	8.493	8.410	0.083	7.576	3B	7.798	8.082	8.494	8.602	0.108	9.525
1/2-13or 0.500-13	UNC	12.700	1.954	1A	0.038	12.661	12.248	—	11.392	11.204	0.188	10.264	1B	10.592	11.023	11.430	11.676	0.246	12.700
				2A	0.038	12.661	12.386	12.248	11.392	11.265	0.127	10.264	2B	10.592	11.023	11.430	11.595	0.165	12.700
				3A	0.000	12.700	12.424	—	11.430	11.336	0.094	10.302	3B	10.592	10.881	11.430	11.551	0.121	12.700
5/8-11or 0.625-11	UNC	15.875	2.309	1A	0.042	15.834	15.373	—	14.335	14.125	0.218	13.002	1B	13.386	13.868	14.377	14.648	0.271	15.875
				2A	0.042	15.834	15.528	15.373	14.335	14.197	0.138	13.002	2B	13.386	13.868	14.377	14.559	0.182	15.875
				3A	0.000	15.875	15.568	—	14.376	14.273	0.103	13.042	3B	13.386	13.693	14.377	14.513	0.136	15.875
3/4-10or 0.750-10	UNC	19.050	2.540	1A	0.046	19.004	18.512	—	17.353	17.430	0.223	15.887	1B	16.307	16.840	17.399	17.691	0.292	19.050
				2A	0.046	19.004	18.677	18.512	17.353	17.204	0.149	15.887	2B	16.307	16.840	17.399	17.594	0.195	19.050
				3A	0.000	19.050	18.273	—	17.399	17.288	0.111	15.933	3B	16.307	16.624	17.399	17.543	0.144	19.050
7/8-9 or 0.875-9	UNC	22.225	2.822	1A	0.050	22.176	21.649	—	20.342	20.102	0.240	18.714	1B	19.177	19.761	20.392	20.703	0.311	22.225
				2A	0.050	22.176	21.824	21.649	20.342	20.183	0.159	18.714	2B	19.177	19.761	20.392	20.599	0.207	22.225
				3A	0.000	22.225	21.872	—	20.391	20.272	0.119	18.762	3B	19.177	19.509	20.392	20.546	0.154	22.225
1-8 or 1.000-8	UNC	25.400	3.175	1A	0.052	25.349	24.778	—	23.286	23.031	0.255	21.452	1B	21.971	22.606	23.338	23.672	0.334	25.400
				2A	0.052	25.349	24.969	24.778	23.286	23.114	0.172	21.452	2B	21.971	22.606	23.338	23.561	0.223	25.400
				3A	0.000	25.400	25.019	—	23.337	23.208	0.129	21.503	3B	21.971	22.344	23.338	23.505	0.167	25.400
1 1/8-7 or 1.125-7	UNC	28.575	3.629	1A	0.056	28.519	27.895	—	26.162	25.886	0.276	24.066	1B	24.638	25.349	26.218	26.576	0.358	28.575
				2A	0.056	28.519	28.103	27.895	26.162	25.980	0.182	24.066	2B	24.638	25.349	26.218	26.456	0.238	28.575
				3A	0.000	28.575	28.159	—	26.217	26.081	0.136	24.122	3B	24.638	25.082	26.218	26.398	0.180	28.575
1 1/8-8 or 1.125-8	UN	28.575	3.175	2A	0.054	28.521	28.141	27.951	26.459	26.284	0.175	24.625	2B	25.146	25.781	26.513	26.741	0.228	28.575
				3A	0.000	28.575	28.194	—	26.512	26.381	0.131	24.678	3B	25.146	25.519	26.513	26.682	0.169	28.575
1 1/4-7 or 1.250-7	UNC	31.750	3.629	1A	0.056	31.694	31.070	—	29.337	29.056	0.281	27.241	1B	27.813	28.524	29.393	29.758	0.365	31.750
				2A	0.056	31.694	31.278	31.070	29.337	29.150	0.187	27.241	2B	27.813	28.524	29.393	29.636	0.243	31.750
				3A	0.000	31.750	31.334	—	29.392	29.254	0.138	27.297	3B	27.813	28.257	29.393	29.575	0.182	31.750
1 1/4-8 or 1.250-8	UN	31.750	3.175	2A	0.054	31.696	31.316	31.126	29.634	29.457	0.177	27.800	2B	28.321	28.956	29.688	29.921	0.233	31.750
				3A	0.000	31.750	31.369	—	29.687	29.553	0.134	27.853	3B	28.321	28.694	29.688	29.862	0.174	31.750
1 3/8-6 or 1.375-6	UNC	34.925	4.233	1A	0.062	34.864	34.171	—	32.113	31.809	0.304	29.669	1B	30.353	31.115	32.175	32.567	0.392	34.925
				2A	0.062	34.864	34.402	34.171	32.113	31.911	0.202	29.669	2B	30.353	31.115	32.175	32.438	0.263	34.925
				3A	0.000	34.925	34.463	—	32.174	32.022	0.152	29.730	3B	30.353	30.850	32.175	32.372	0.197	34.925
1 3/8-8 or 1.375-8	UN	34.925	3.175	2A	0.057	34.869	34.489	34.298	32.806	32.624	0.182	30.972	2B	31.496	32.131	32.863	33.098	0.235	34.925
				3A	0.000	34.925	34.544	—	32.862	32.726	0.136	31.028	3B	31.496	31.869	32.863	33.040	0.177	34.925
1 1/2-6 or 1.500-6	UNC	38.100	4.233	1A	0.062	38.039	37.346	—	35.288	34.981	0.307	32.844	1B	33.528	34.290	35.350	35.750	0.400	38.100
				2A	0.062	38.039	37.577	37.346	35.288	35.083	0.205	32.844	2B	33.528	34.290	35.350	35.615	0.265	38.100
				3A	0.000	38.100	37.638	—	35.349	35.195	0.154	32.905	3B	33.528	34.025	35.350	35.549	0.199	38.100
1 1/2-8 or 1.500-8	UN	38.100	3.175	2A	0.057	38.044	37.664	37.473	35.981	35.797	0.184	34.147	2B	34.671	35.306	36.038	36.278	0.240	38.100
				3A	0.000	38.100	37.719	—	36.037	35.898	0.139	34.203	3B	34.671	35.044	36.038	36.217	0.179	38.100
1 5/8-6 or 1.625-6	UNC	41.275	4.233	2A	0.065	41.211	40.750	—	38.460	38.253	0.207	36.017	2B	36.703	37.465	38.525	38.795	0.270	41.275
				3A	0.000	41.275	40.813	—	38.524	38.367	0.157	36.080	3B	36.703	37.200	38.525	38.727	0.202	41.275
1 5/8-8 or 1.625-8	UN	41.275	3.175	2A	0.057	41.219	40.839	40.648	39.156	38.969	0.187	37.322	2B	37.846	38.481	39.213	39.458	0.245	41.275
				3A	0.000	41.275	40.894	—	39.212	39.071	0.141	37.378	3B	37.846	38.219	39.213	39.395	0.182	41.275
1 3/4-5 or 1.750-5	UNC	44.450	5.080	1A	0.070	44.381	43.600	—	41.081	40.742	0.339	38.148	1B	38.964	39.827	41.151	41.592	0.441	44.450
				2A	0.070	44.381	43.861	43.600	41.081	40.856	0.225	38.148	2B	38.964	39.827	41.151	41.445	0.294	44.450
				3A	0.000	44.450	43.930	—	41.150	40.981	0.169	38.216	3B	38.964	39.560	41.151	41.371	0.220	44.450
1 3/4-6 or 1.750-6	UN	44.450	4.233	2A	0.065	44.386	43.925	—	41.635	41.425	0.210	39.192	2B	39.878	40.640	41.700	41.973	0.273	44.450
				3A	0.000	44.450	43.988	—	41.699	41.540	0.159	39.255	3B	39.878	40.375	41.700	41.904	0.204	44.450
1 3/4-8 or 1.750-8	UN	44.450	3.175	2A	0.059	44.391	44.011	43.821	42.329	42.139	0.190	40.495	2B	41.021	41.656	42.388	42.636	0.248	44.450
				3A	0.000	44.450	44.069	—	42.387	42.243	0.144	40.553	3B	41.021	41.394	42.388	42.575	0.187	44.450
1 7/8-6 or 1.875-6	UN	47.625	4.233	2A	0.065	47.561	47.100	—	44.810	44.598	0.212	42.367	2B	43.053	43.815	43.875	45.153	0.278	47.625
				3A	0.000	47.625	47.163	—	44.874	44.715	0.159	42.430	3B	43.053	43.550	43.875	45.082	0.207	47.625
1 7/8-8 or 1.875-8	UN	47.625	3.175	2A	0.059	47.566	47.186	46.996	45.504	45.309	0.195	43.670	2B	44.196	44.831	45.563	45.816	0.253	47.625
				3A	0.000	47.625	47.244	—	45.562	45.418	0.144	43.728	3B	44.196	44.569	45.563	45.753	0.190	47.625

(UN and UNR Thread Form)

unit: mm

Nominal Size (in) and Threds per in	Series Designation	Metric Equivalents		External								Internal						
				Class	Allowance	Major Diameter			Pich Diameter			Minor Diameter	Class	Minor Diameter		Pich Diameter			Major Diameter
		Diameter	Pitch			max.b	min.	min.d	max.b	min.	Tolerance			min.	max.	min.	max.	Tolerance	min.
2-4-½or 2.000-4.5	UNC	50.800	5.644	1A	0.074	50.726	49.889	—	47.061	46.698	0.363	43.802	1B	44.679	45.593	47.135	47.607	0.172	50.800
				2A	0.074	50.726	50.168	49.889	47.061	46.820	0.741	43.802	2B	44.679	45.593	47.135	47.449	0.314	50.800
				3A	0.000	50.800	50.242	—	47.134	46.955	0.179	43.875	3B	44.679	45.366	47.135	47.371	0.236	50.800
2 -6 or 2.000-6	UN	50.800	4.233	2A	0.067	50.733	50.272	—	47.983	47.765	0.218	45.539	2B	46.228	46.990	48.050	48.331	0.281	50.800
				3A	0.000	50.800	50.338	—	48.049	47.887	0.162	45.605	3B	46.228	46.725	48.050	48.260	0.210	50.800
2 -8 or 2.000-8	UN	50.800	3.175	2A	0.059	50.741	50.361	50.171	48.679	48.481	0.198	46.845	2B	47.371	48.006	48.738	48.994	0.256	50.800
				3A	0.000	50.800	50.419	—	48.737	48.591	0.146	46.903	3B	47.371	47.744	48.738	48.930	0.192	50.800
2⅛-6 or 2.125-6	UN	53.975	4.233	2A	0.067	53.908	53.447	—	51.158	50.938	0.220	48.714	2B	49.403	50.165	51.225	51.511	0.286	53.975
				3A	0.000	53.975	53.513	—	51.224	51.060	0.164	48.780	3B	49.403	49.900	51.225	51.437	0.212	53.975
2⅛-8 or 2.125-8	UN	53.975	3.175	2A	0.062	53.914	53.534	53.343	51.851	51.651	0.200	50.017	2B	50.546	51.181	51.913	52.171	0.258	53.975
				3A	0.000	53.975	53.594	—	51.912	51.763	0.149	50.078	3B	50.546	50.919	51.913	52.108	0.195	53.975
2¼-4½or 2.250-4.5	UNC	57.150	5.644	1A	0.074	57.076	56.239	—	53.411	53.041	0.370	50.152	1B	51.029	51.943	53.485	53.967	0.482	57.150
				2A	0.074	57.076	56.518	56.239	53.411	53.165	0.246	50.152	2B	51.029	51.943	53.485	53.804	0.419	57.150
				3A	0.000	57.150	56.592	—	53.484	53.300	0.184	50.225	3B	51.029	51.716	53.485	53.726	0.241	57.150
2¼-6 or 2.250-6	UN	57.150	4.233	2A	0.067	57.083	56.622	—	54.333	54.110	0.223	51.889	2B	52.578	53.340	54.400	54.688	0.288	57.150
				3A	0.000	57.150	56.688	—	54.399	54.232	0.167	51.955	3B	52.578	53.075	54.400	54.615	0.215	57.150
2¼-8 or 2.250-8	UN	57.150	3.175	2A	0.062	57.089	56.709	56.518	55.026	54.824	0.202	53.192	2B	53.721	54.356	55.088	55.351	0.263	57.150
				3A	0.000	57.150	56.769	—	55.087	54.936	0.151	53.253	3B	53.721	54.094	55.088	55.285	0.197	57.150
2⅜-6 or 2.375-6	UN	60.325	4.233	2A	0.070	60.256	59.795	—	57.505	57.280	0.225	55.062	2B	55.753	56.540	57.575	57.866	0.291	60.325
				3A	0.000	60.325	59.863	—	57.574	57.407	0.167	55.130	3B	55.753	56.250	57.575	57.792	0.217	60.325
2⅜-8 or 2.375-8	UN	60.325	3.175	2A	0.062	60.264	59.884	—	58.201	57.996	0.205	56.367	2B	56.896	57.531	58.263	58.529	0.266	60.325
				3A	0.000	60.325	59.944	—	58.262	58.111	0.151	54.428	3B	56.896	57.269	58.263	58.463	0.200	60.325
2½-4 or 2.500-4	UNC	63.500	6.350	1A	0.080	63.421	62.515	—	59.296	58.903	0.393	55.631	1B	56.617	57.581	59.376	59.888	0.512	63.500
				2A	0.080	63.421	62.817	62.515	59.296	59.033	0.263	55.631	2B	56.617	57.581	59.376	59.717	0.341	63.500
				3A	0.000	63.500	62.896	—	59.375	59.177	0.198	55.709	3B	56.617	57.388	59.376	59.631	0.255	63.500
2½-6 or 2.500-6	UN	63.500	4.233	2A	0.070	63.431	62.970	—	60.680	60.452	0.228	58.237	2B	58.928	59.690	60.750	61.043	0.293	63.500
				3A	0.000	63.500	63.038	—	60.749	60.579	0.170	58.305	3B	58.928	59.425	60.750	60.970	0.220	63.500
2½-8 or 2.500-8	UN	63.500	3.175	2A	0.062	63.439	63.059	62.868	61.376	61.169	0.207	59.542	2B	60.071	60.706	61.438	61.706	0.368	63.500
				3A	0.000	63.500	63.119	—	61.437	61.283	0.154	59.603	3B	60.071	60.444	61.438	61.640	0.202	63.500
2⅝-6 or 2.625-6	UN	66.675	4.233	2A	0.070	66.606	66.145	—	63.855	63.627	0.228	61.412	2B	62.103	62.865	63.925	64.223	0.295	66.675
				3A	0.000	66.675	66.213	—	63.924	63.752	0.172	61.480	3B	62.103	62.600	63.925	64.147	0.222	66.675
2⅝-8 or 2.625-8	UN	66.675	3.175	2A	0.064	66.611	66.231	—	64.549	64.341	0.208	62.715	2B	63.246	63.881	64.613	64.384	0.271	66.675
				3A	0.000	66.675	66.294	—	64.612	64.456	0.156	62.778	3B	63.246	63.619	64.613	64.815	0.202	66.675
2¾-4 or 2.750-4	UNC	69.850	6.350	1A	0.083	69.768	68.862	—	65.643	65.243	0.400	61.978	1B	62.967	63.931	65.726	66.248	0.523	69.850
				2A	0.083	69.768	69.165	68.862	65.643	65.378	0.265	61.978	2B	62.967	63.931	65.726	66.073	0.347	69.850
				3A	0.000	69.850	69.246	—	65.725	65.525	0.200	62.059	3B	62.967	63.738	65.726	65.986	0.260	69.850
2¾-6 or 2.750-6	UN	69.850	4.233	2A	0.070	69.781	69.320	—	67.030	66.800	0.230	64.587	2B	65.278	66.040	67.100	67.401	0.301	69.850
				3A	0.000	69.850	69.388	—	67.099	66.927	0.172	64.655	3B	65.278	65.775	67.100	67.325	0.225	69.850
2¾-8 or 2.750-8	UN	69.850	3.175	2A	0.064	69.786	69.406	69.215	67.724	67.514	0.210	65.890	2B	66.421	67.056	67.788	68.061	0.273	69.850
				3A	0.000	69.850	69.406	—	67.787	67.628	0.159	65.953	3B	66.421	65.794	67.788	67.993	0.205	69.850
2⅞-6 or 2.875-6	UN	73.025	4.233	2A	0.072	72.953	72.492	—	70.203	69.970	0.233	67.759	2B	68.453	69.215	70.275	70.578	0.303	73.025
				3A	0.000	73.025	72.563	—	70.274	70.099	0.175	67.830	3B	68.453	68.950	70.275	70.502	0.227	73.025
2⅞-8 or 2.875-8	UN	73.025	3.175	2A	0.064	72.961	72.581	—	70.899	70.686	0.213	69.065	2B	69.596	70.231	70.963	71.241	0.278	73.025
				3A	0.000	73.025	72.644	—	70.962	70.803	0.159	69.128	3B	69.596	69.969	70.963	71.170	0.207	73.025
3 -4 or 3.000-4	UNC	76.200	6.350	1A	0.083	76.118	75.212	—	71.993	71.585	0.408	68.328	1B	69.317	70.281	72.076	72.605	0.529	76.200
				2A	0.083	76.118	75.515	75.212	71.993	71.722	0.271	68.328	2B	69.317	70.281	72.076	72.428	0.352	76.200
				3A	0.000	76.200	75.596	—	72.075	71.872	0.203	68.409	3B	69.317	70.088	72.076	72.339	0.263	76.200
3 -6 or 3.000-6	UN	76.200	4.233	2A	0.072	76.128	75.667	—	73.378	73.142	0.236	70.934	2B	71.628	72.390	73.450	73.756	0.306	76.200
				3A	0.000	76.200	75.738	—	73.449	73.272	0.177	71.005	3B	71.628	72.125	73.450	73.680	0.230	76.200
3 -8 or 3.000-8	UN	76.200	3.175	2A	0.067	76.133	75.753	75.563	74.071	73.856	0.215	72.237	2B	72.771	73.406	74.138	74.419	0.281	76.200
				3A	0.000	76.200	75.819	—	74.137	73.975	0.162	72.303	3B	72.771	73.144	74.138	74.348	0.210	76.200
3⅛-6 or 3.125-6	UN	79.375	4.233	2A	0.072	79.303	78.842	—	76.553	76.315	0.238	74.109	2B	74.803	75.565	76.625	76.934	0.309	79.375
				3A	0.000	79.375	79.913	—	76.624	76.447	0.177	74.180	3B	74.803	75.300	76.625	76.857	0.232	79.375
3⅛-8 or 3.125-8	UN	79.375	3.175	2A	0.067	79.308	78.928	—	77.246	77.029	0.217	75.412	2B	75.946	76.581	77.313	77.597	0.284	79.375
				3A	0.000	79.375	78.994	—	77.312	77.150	0.162	75.478	3B	75.946	76.319	77.313	77.525	0.212	79.375
3¼-4 or 3.250-4	UNC	82.550	6.350	1A	0.085	82.466	81.860	—	78.341	77.928	0.413	74.676	1B	75.667	76.631	78.426	78.963	0.537	82.550
				2A	0.085	82.466	81.862	81.560	78.341	78.065	0.276	74.676	2B	75.667	76.631	78.426	78.783	0.357	82.550
				3A	0.000	82.550	81.946	—	78.425	78.217	0.208	74.759	3B	75.667	76.438	78.426	78.694	0.268	82.550
3¼-6 or 3.250-6	UN	82.550	4.233	2A	0.072	82.478	82.017	—	79.728	79.487	0.241	77.284	2B	77.978	78.740	79.800	80.111	0.311	82.550
				3A	0.000	82.550	82.088	—	79.799	79.619	0.180	77.355	3B	77.978	78.475	79.800	80.032	0.232	82.550
3¼-8 or 3.250-8	UN	82.550	3.175	2A	0.067	82.483	82.103	81.913	80.421	80.201	0.220	78.587	2B	79.121	79.756	80.488	80.774	0.286	82.550
				3A	0.000	82.550	82.169	—	80.487	80.323	0.164	78.653	3B	79.121	79.494	80.488	80.703	0.215	82.550
3⅜-6 or 3.375-6	UN	85.725	4.233	2A	0.075	85.651	85.190	—	82.900	82.660	0.240	80.457	2B	81.153	81.915	82.975	83.289	0.314	85.725
				3A	0.000	85.725	85.263	—	82.974	82.792	0.182	80.530	3B	81.153	81.650	82.975	83.210	0.235	85.725
3⅜-8 or 3.375-8	UN	85.725	3.175	2A	0.067	85.658	85.278	—	83.596	83.373	0.223	81.762	2B	82.296	82.931	83.663	83.952	0.289	85.725
				3A	0.000	85.725	85.344	—	83.662	83.495	0.167	81.828	3B	82.296	82.669	83.663	83.878	0.215	85.725
3½-4 or 3.500-4	UNC	88.900	6.350	1A	0.085	88.816	87.910	—	84.691	84.270	0.421	81.026	1B	82.017	82.981	84.776	85.321	0.545	88.900
				2A	0.085	88.816	88.212	87.910	84.691	84.412	0.279	81.026	2B	82.017	82.981	84.776	85.138	0.362	88.900
				3A	0.000	88.900	88.296	—	84.775	84.565	0.210	81.109	3B	82.017	82.788	84.776	85.049	0.273	88.900
3½-6 or 3.500-6	UN	88.900	4.233	2A	0.075	88.826	88.365	—	86.075	85.832	0.243	83.632	2B	84.328	85.090	86.150	86.466	0.316	88.900
				3A	0.000	88.900	88.438	—	86.149	85.967	0.182	83.705	3B	84.328	84.825	86.150	86.387	0.237	88.900
3½-8 or 3.500-8	UN	88.900	3.175	2A	0.067	88.833	88.453	88.263	86.771	86.548	0.223	84.937	2B	85.471	86.106	86.838	87.129	0.291	88.900
				3A	0.000	88.900	88.519	—	86.837	86.670	0.167	85.003	3B	85.471	85.844	86.838	87.055	0.217	88.900
3⅝-6 or 3.625-6	UN	92.075	4.233	2A	0.075	92.001	91.540	—	89.250	89.005	0.245	86.807	2B	87.503	88.265	89.325	89.644	0.319	92.075
				3A	0.000	92.075	91.613	—	89.324	89.139	0.185	86.880	3B	87.503	88.000	89.325	89.565	0.240	92.075
3⅝-8 or 3.625-8	UN	92.075	3.175	2A	0.070	92.006	91.626	—	89.943	89.718	0.225	88.110	2B	88.646	89.281	90.013	90.307	0.294	92.075
				3A	0.000	92.075	91.694	—	90.012	89.843	0.169	88.178	3B	88.646	89.019	90.013	90.233	0.220	92.075
3¾-4 or 3.750-4	UNC	95.250	6.350	1A	0.088	95.163	94.257	—	91.038	90.612	0.426	87.373	1B	88.367	89.331	91.126	91.678	0.552	95.250
				2A	0.088	95.163	94.560	94.257	91.038	90.755	0.283	87.373	2B	88.367	89.331	91.126	91.493	0.367	95.250
				3A	0.000	95.250	94.646	—	91.125	90.912	0.213	87.459	3B	88.367	89.138	91.126	91.401	0.275	95.250
3¾-6 or 3.750-6	UN	95.250	4.233	2A	0.075	95.176	94.715	—	92.425	92.177	0.248	89.982	2B	90.678	91.440	92.500	92.821	0.321	95.250
				3A	0.000	95.250	94.788	—	92.499	92.314	0.185	90.055	3B	90.678	91.175	92.500	92.740	0.240	95.250
3¾-8 or 3.750-8	UN	95.250	3.175	2A	0.070	95.181	94.801	94.610	93.118	92.891	0.227	91.285	2B	91.821	92.456	93.188	83.484	0.296	95.250
				3A	0.000	95.250	94.869	—	93.187	93.018	0.169	91.353	3B	91.821	92.194	93.188	93.411	0.223	95.250

Mechanical Propertiss of Bolt, Screws and Studs

KS B 0233 ISO 898/1
JIS B 1051 DIN 267/3

subelause No	Mechanical Property		3.6	4.6	4.8	5.6	5.8	6.8	8.8 d≦16	8.8 d>16	9.8	10.9	12.9	4T	5T	6T	7T
5.1 and 5.2	Tensile strength Kgf/mm²	Nominal	30.59	40.78		50.98		61.18	81.57		91.77	101.97	122.36	—	—	—	—
		min.	33.7	40 8	42.8	51.0	53.0	61.2	81.6	84.6	91.8	106	124	40	50	60	70
5.3	Vickers hardness HV	min.	95	120	130	155	160	190	230	255	280	310	372	—	—	—	—
		max.	220					250	300	336	360	382	434	—	—	—	—
5.4	Brinell hardness HB	min.	90	114	124	147	152	181	219	242	266	295	353	105	135	170	201
		max.	209					238	285	319	342	363	412	229	241	255	277
5.5	Rockwell hardness HR	HrB min.	52	67	71	79	82	89	—	—	—	—	—	60	76	88	—
		HrC min.	—	—	—	—	—	—	20	23	27	31	38	—	—	—	15
		HrB max.	95					99	—	—	—	—	—	98	100	103	—
		HrC max.	—						30	34	36	39	44	—	—	—	29
5.6	Surface hardness HV	max	—						320	356	380	402	454	—	—	—	—
5.7	Yield stress R_{el} Kgf/mm²	nominal	18.35	24.47	32.63	30.59	40.78	48.94	—	—	—	—	—	—	—	—	—
		min.	19.37	24.47	34.67	30.59	42.82	48.94	—	—	—	—	—	23	28	40	50
5.8	Stress at permanent -limit Rp 0.2	nominal	—						65.3	65.3	73.4	91.8	110.1	—	—	—	—
		min.	—						65.3	67.3	73.4	95.9	112.0	—	—	—	—
5.9	Stress under proof load	Rp 0.2	0.94	0.94	0.91	0.94	0.91	0.91	0.91	0.91	0.91	0.88	0.88	—	—	—	—
		Kgf/mm²	18.4	22.9	31.6	28.6	38.7	44.9	59.1	61.2	66.3	84.6	98.9	—	—	—	—
5.10	Elongation after fracture %	min	25	22	14	20	10	8	12	12	10	9	8	10	10	10	15
5.11	Strength under wedge loading	The valus for full size bolts and screws(not studs) should equal the minimum values for tensile strength shown in 5.2															
5.12	Impact strength Kgf.m	min				2.55			3.06	3.06	2.55	2.04	1.53				
5.13	Head soundness	no fracture															
5.14	Minimum height of non-decarburized thread zone E								$\frac{1}{2}H_1$			$\frac{2}{3}H_1$	$\frac{3}{4}H_1$				
	Maximum depth of complete decarburization, G								0.015								

Mechanical Requirement

ASTM

	Specification Grade		Diameter inch	Proof Load PSI	Yield Strength min PSI	Tensile strength min PSI	Elongation min %	Reduction min %	Brinell hardness HB	Rockwell hardness HrB	Rockwell hardness HrC
BOLT	A193	B5	up to 4	—	80,000	100,000	16	50	—	—	—
		B6	up to 4	—	85,000	110,000	15	50	—	—	—
		B7	2½ and under	—	105,000	125,000	16	50	—	—	—
		B7M	2½ and under	—	80,000	100,000	18	50	200-235	93-99	—
		B16	2½ and under	—	105,000	125,000	18	50	253-319	—	25-34
	B8, B8C, B8M, B8P, B8T, B8LN, B8MLN···		all diameters	—	30,000	75,000	30	50	223 max.	96 max.	—
	A320	L7, L7A, L7B, L7C, L70, L71, L72	2½ and under	—	105,000	125,000	16	50	—	—	—
		L7M	2½ and under	—	80,000	100,000	18	50	200-235	93-99	—
	A325		1/2 to 1	85,000	92,000	120,000	—	—	248-331	—	24-35
			1-1/8 to 1½	74,000	81,000	105,000	14	35	223-293	—	19-31
	A354	BC	1/4 to 2½	105,000	109,000	125,000	16	50	255-331	—	26-36
			over 2½	95,000	99,000	115,000	16	45	235-311	—	22-33
		BD	1/4 to 2½	120,000	130,000	150,000	14	40	331-363	—	33-39
	A449		1/4 to 1	85,000	92,000	120,000	14	35	255-321	—	25-34
			over 1 to 1½	74,000	81,000	105,000	14	35	223-285	—	19-30
	A490		1/2 to 1½	120,000	130,000	150,000-170,000	14	40	311-352	—	33-38
NUT	A194	2H	to 1½	—	—	—	—	—	248-352	—	24-38
		2HM	—	—	—	—	—	—	159-237	—	22max.
		3,4,7	—	—	—	—	—	—	248-352	—	24-38
		8	—	—	—	—	—	—	126-300	60-105	
	A563	A	—	—	—	—	—	—	116-302	55 min.	32max.
		B	—	—	—	—	—	—	121-302	69 min.	32max.
		C	—	—	—	—	—	—	143-352	78 min.	38max.
		DH	—	—	—	—	—	—	248-352	—	24-38