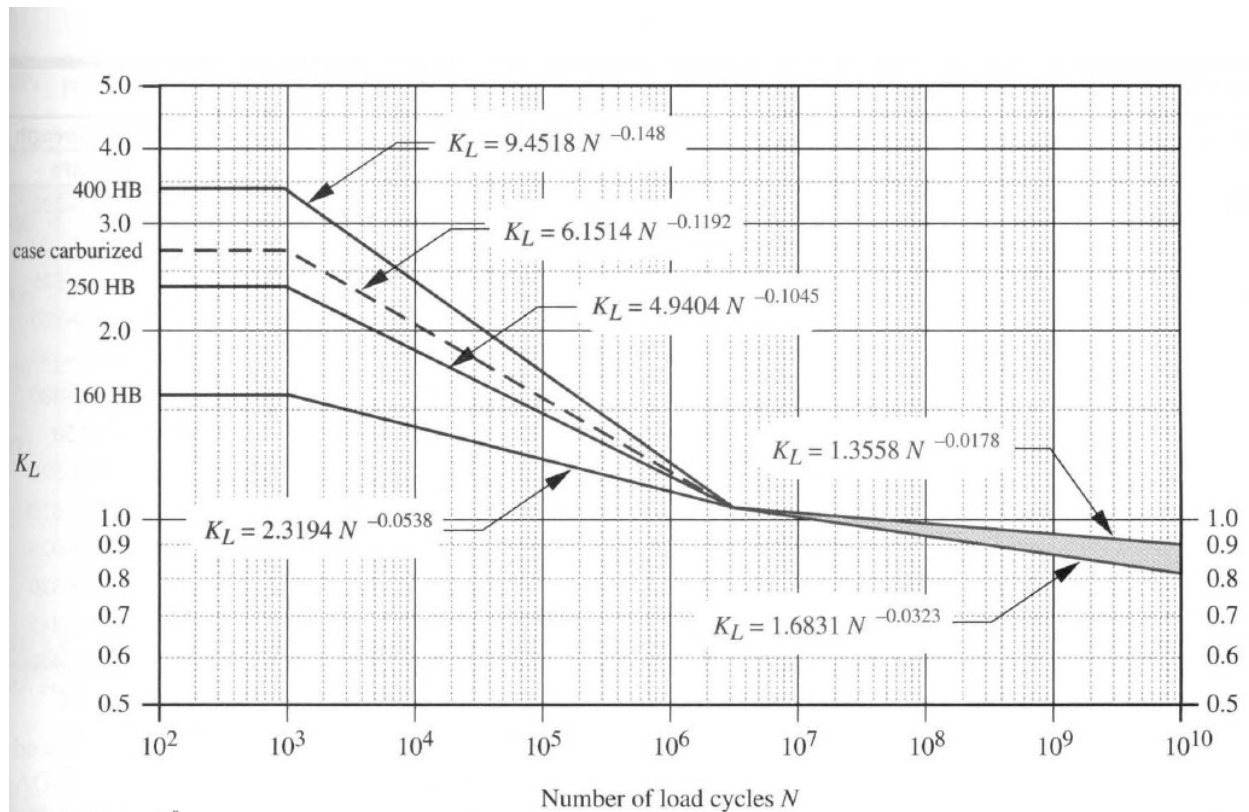


Cálculo de resistência a fadiga de flexão:

KI:



Resistência a fadiga de flexão S_{fb}' :

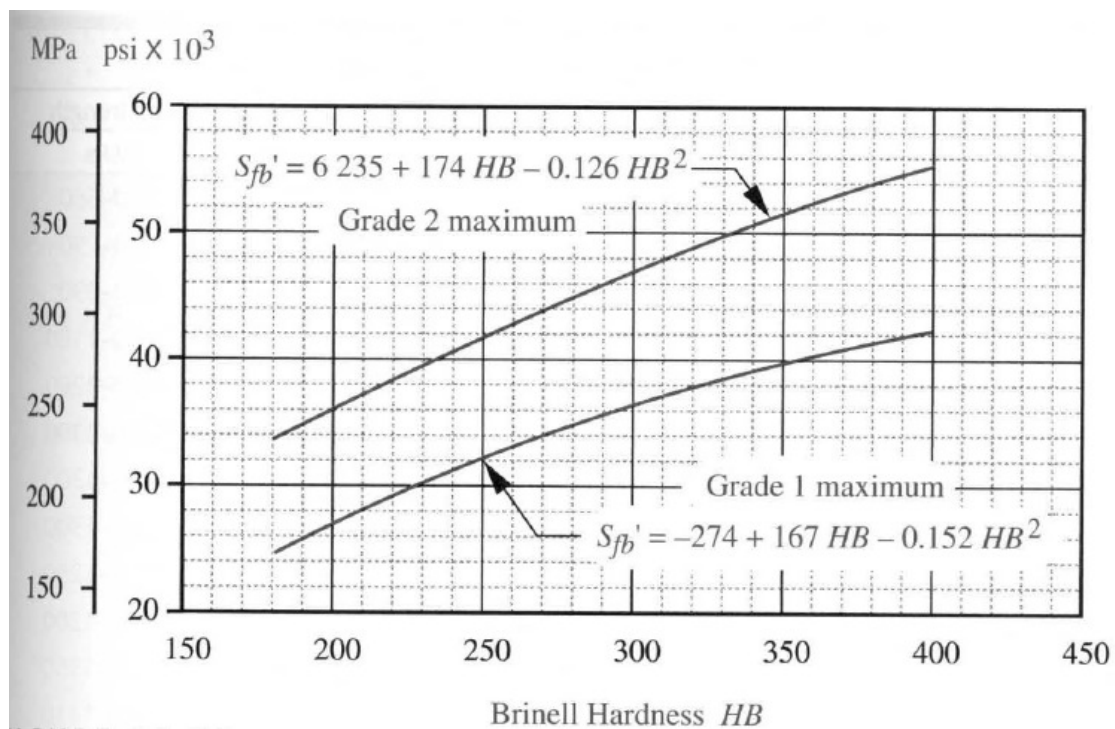
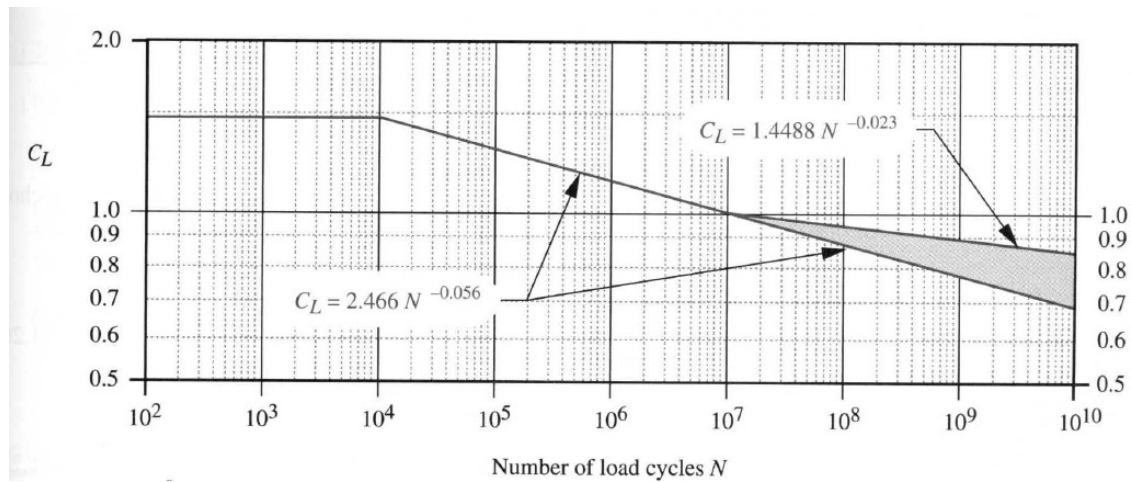


Table 11-20 AGMA Bending-Fatigue Strengths S_{fb}' for a Selection of Gear Materials*

Material	AGMA Class	Material Designation	Heat Treatment	Minimum Surface Hardness	Bending-Fatigue Strength	
					psi x 10 ³	MPa
Steel	A1-A5		Through hardened	≤ 180 HB	25-33	170-230
			Through hardened	240 HB	31-41	210-280
			Through hardened	300 HB	36-47	250-325
			Through hardened	360 HB	40-52	280-360
			Through hardened	400 HB	42-56	290-390
			Flame or induction hardened	Type A pattern 50-54 HRC	45-55	310-380
			Flame or induction hardened	Type B pattern	22	150
			Carburized and case hardened	55-64 HRC	55-75	380-520
		AISI 4140	Nitrided	84.6 HR15N [†]	34-45	230-310
		AISI 4340	Nitrided	83.5 HR15N	36-47	250-325
		Nitralloy 135M	Nitrided	90.0 HR15N	38-48	260-330
		Nitralloy N	Nitrided	90.0 HR15N	40-50	280-345
		2.5% Chrome	Nitrided	87.5-90.0 15N	55-65	380-450
Cast iron	20	Class 20	As cast		5	35
	30	Class 30	As cast	175 HB	8	69
	40	Class 40	As cast	200 HB	13	90
Nodular (ductile) iron	A-7-a	60-40-18	Annealed	140 HB	22-33	150-230
	A-7-c	80-55-06	Quenched and tempered	180 HB	22-33	150-230
	A-7-d	100-70-03	Quenched and tempered	230 HB	27-40	180-280
	A-7-e	120-90-02	Quenched and tempered	230 HB	27-40	180-280
Malleable iron (pearlitic)	A-8-c	45007		165 HB	10	70
	A-8-e	50005		180 HB	13	90
	A-8-f	53007		195 HB	16	110
	A-8-i	80002		240 HB	21	145
Bronze	Bronze 2	AGMA 2C	Sand cast	40 ksi min tensile strength	5.7	40
	Al/Br 3	ASTM B-148 78 alloy 954	Heat treated	90 ksi min tensile strength	23.6	160

Tensão de fadiga de contato

Fator de vida de superfície C_L



Resistência a fadiga de contato S_{fc}' :

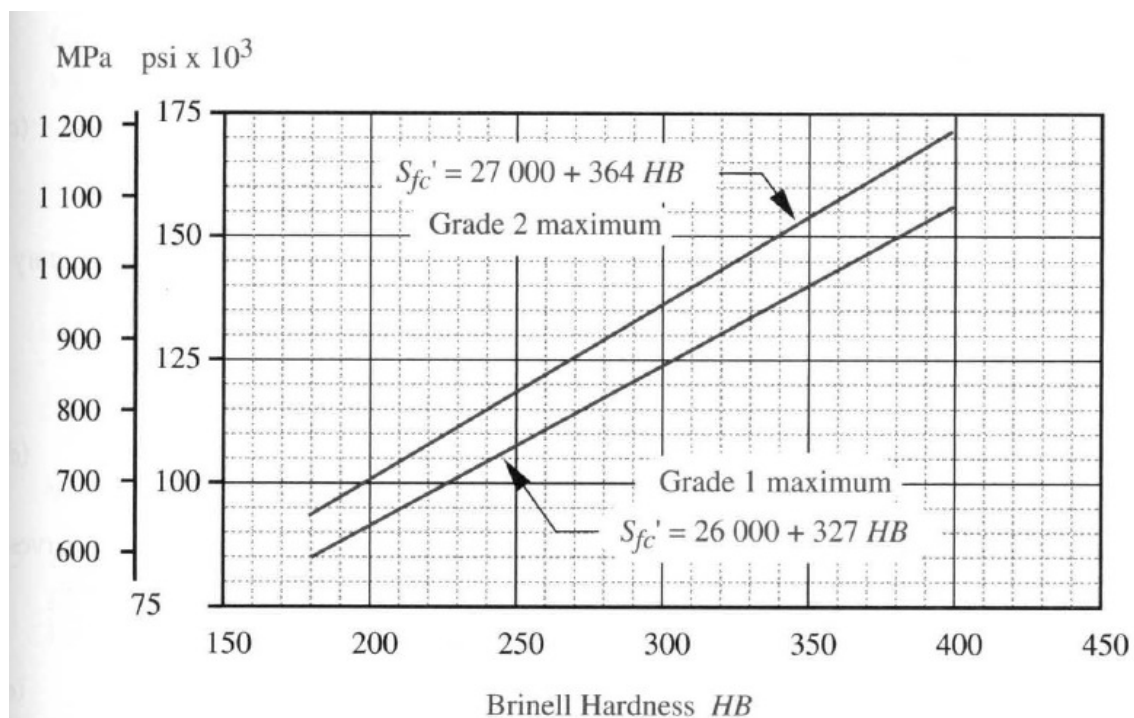


Table 11-21 AGMA Surface-Fatigue Strengths S_{fc} for a Selection of Gear Materials*

Material	AGMA Class	Material Designation	Heat Treatment	Minimum Surface Hardness	Surface-Fatigue Strength	
					psi x 10 ³	MPa
Steel	A1-A5		Through hardened	≤ 180 HB	85-95	590-660
			Through hardened	240 HB	105-115	720-790
			Through hardened	300 HB	120-135	830-930
			Through hardened	360 HB	145-160	1000-1100
			Through hardened	400 HB	155-170	1100-1200
			Flame or induction hardened	50 HRC	170-190	1200-1300
			Flame or induction hardened	54 HRC	175-195	1200-1300
			Carburized and case hardened	55-64 HRC	180-225	1250-1300
		AISI 4140	Nitrided	84.6 HR15N [†]	155-180	1100-1250
		AISI 4340	Nitrided	83.5 HR15N	150-175	1050-1200
		Nitralloy 135M	Nitrided	90.0 HR15N	170-195	1170-1350
		Nitralloy N	Nitrided	90.0 HR15N	195-205	1340-1410
		2.5% Chrome	Nitrided	87.5 HR15N	155-172	1100-1200
		2.5% Chrome	Nitrided	90.0 HR15N	192-216	1300-1500
Cast iron	20	Class 20	As cast		50-60	340-410
	30	Class 30	As cast	175 HB	65-70	450-520
	40	Class 40	As cast	200 HB	75-85	520-590
Nodular (ductile) iron	A-7-a	60-40-18	Annealed	140 HB	77-92	530-630
	A-7-c	80-55-06	Quenched and tempered	180 HB	77-92	530-630
	A-7-d	100-70-03	Quenched and tempered	230 HB	92-112	630-770
	A-7-e	120-90-02	Quenched and tempered	230 HB	103-126	710-870
Malleable iron (pearlitic)	A-8-c	45007		165 HB	72	500
	A-8-e	50005		180 HB	78	540
	A-8-f	53007		195 HB	83	570
	A-8-i	80002		240 HB	94	650
Bronze	Bronze 2	AGMA 2C	Sand cast	40 ksi min tensile strength	30	450
	Al/Br 3	ASTM B-148 78 alloy 954	Heat-treated	90 ksi min tensile strength	65	450

[†] Rockwell 15N scale used for case-hardened materials—see Section 2-4