17.4.3.L Tooth Flank Load Distribution Factor, $K_{H\beta}$

Factors are listed in **Tables 17-25** and **17-26**. If the gear and pinion are unhardened, the factors are to be reduced to 90% of the values in the table.

Table 17-25 Tooth Flank Load Distribution Factor for Spiral Bevel Gears, Zerol Bevel Gears and Straight Bevel Gears with Crownina. $K_{H\beta}$

Stiffness of Shaft, Gear Box, etc.	Both Gears Supported On Two Sides	One Gear Supported on One End	Both Gears Supported on One End
Very Stiff	1.3	1.5	1.7
Average	1.6	1.85	2.1
Somewhat Weak	1.75	2.1	2.5

Table 17-26 Tooth Flank Load Distribution Factor for Straight Bevel Gear without Crownina. $K_{H\beta}$

Stiffness of Shaft, Gear Box, etc.	Both Gears Supported On Two Sides	One Gear Supported on One End	Both Gears Supported on One End
Very Stiff	1.3	1.5	1.7
Average	1.85	2.1	2.6
somewhat Weak	2.8	3.3	3.8

17.4.3.M Dynamic Load Factor, K_V

The dynamic load factor can be obtained from **Table 17-24**.

17.4.3.N Overload Factor, K_O

The overload factor can be computed by **Equation 17-11** or found in **Table 17-4**.

17.4.3.O Reliability Factor, C_R

The general practice is to assume C_R to be at least 1.15.

17.4.3.P Allowable Hertz Stress, σ_{Hlim}

The values of allowable Hertz stress are given in **Tables 17-12** through **17-16**.

17.4.4 Examples of Bevel Gear Surface Strength Calculation

Tables 17-26A and **17-26B** give the calculations of surface strength factors of Gleason straight bevel gears.

Table 17-26A Gleason Straight Bevel Gear Design Details

No.	Item	Symbol	Unit	Pinion	Gear
1	Shaft Angle	Σ	degree	90º	
2	Module	m	mm	2	
3	Pressure Angle	α	degree	20º	
4	Central Spiral Angle	βm		0º	
5	Number of Teeth	z		20	40
6	Pitch Circle Diameter	d	mm	40.000	80.000
7	Pitch Cone Angle	δ	degree	26.565.5º	63.43495º
8	Cone Distance	R_e	mm	44.721	
9	Tooth Width	b		15	
10	Central Pitch Circle Diameter	d_m		33.292	66.584
11	Precision Grade			JIS 3	JIS 3
12	Manufacturing Method			Gleason No. 104	
13	Surface Roughness			12.5 μm	12.5 μm
14	Revolutions per Minute	n	rpm	1500	750
15	Linear Speed	v	m/s	3.142	
16	Direction of Load			Unidirectional	
17	Duty Cycle		cycle	Over 10^7 cycles	
18	Material			SCM 415	
19	Heat Treatment			Carburized	
20	Surface Hardness			HV 600 ... 640	
21	Core Hardness			HB 260 ... 280	
22	Effective Carburized Depth		mm	0.3 ... 0.5	