

Table 1.3 Deformation Requirements for Standard ASTM Deformed Reinforcing Bars

Bar Size Designation	Maximum Average Spacing, in.	Maximum Average Height, in.	Maximum* Gap, in.
#3 [#10]	0.262	0.015	0.143
#4 [#13]	0.350	0.020	0.191
#5 [#16]	0.437	0.028	0.239
#6 [#19]	0.525	0.038	0.286
#7 [#22]	0.612	0.044	0.334
#8 [#25]	0.700	0.050	0.383
#9 [#29]	0.790	0.056	0.431
#10 [#32]	0.889	0.064	0.487
#11 [#36]	0.987	0.071	0.540
#14 [#43]	1.185	0.085	0.648
#18 [#57]	1.58	0.102	0.864

*Chord of 12.5% of nominal perimeter

Table 1.4 Chemical Composition Requirements for Standard ASTM Deformed Reinforcing Bars

Type of Steel and ASTM Designation	Condition*	Element									
		Carbon (C)	Manganese (Mn)	Phosphorus (P)	Sulphur (S)	Silicon (Si)	Copper (Cu)	Nickel (Ni)	Chromium (Cr)	Molybdenum (Mo)	Vanadium (V)
Billet-Steel A615	1	X	X	X	X						
	2			0.06%							
	3			0.075%							
Low-Alloy Steel A706	1	X	X	X	X	X	X	X	X	X	X
	2	0.30%	1.50%	0.035%	0.045%	0.50%					
	3	0.33%	1.56%	0.043%	0.053%	0.55%					

*CONDITION DEFINITIONS:

1. Analysis required of these elements for each heat.
2. Maximum allowable chemical content for each heat.
3. Maximum allowable chemical content for finished bar.

Table 1.5 Grade 60 Rebar ACI Compression Development and Lap Splice Lengths for $f'_c = 3,000$ psi to 5,000 psi

Bar Size Designation	Compression Development Lengths per f'_c			Compression Lap Splice Length
	$f'_c = 3,000$ psi	$f'_c = 4,000$ psi	$f'_c = 5,000$ psi	
#3 [#10]	9	8	8	12
#4 [#13]	11	10	9	15
#5 [#16]	14	12	12	19
#6 [#19]	17	15	14	23
#7 [#22]	19	17	16	27
#8 [#25]	22	19	18	30
#9 [#29]	25	22	21	34
#10 [#32]	28	24	23	38
#11 [#36]	31	27	26	43
#14 [#43]	37	32	31	N/A
#18 [#57]	50	43	41	N/A

Notes:

1. Tabulated values are based on Grade 60 reinforcing bars and normal-weight concrete.
2. Compression development lengths and compression lap splice lengths are based on ACI 318-02, Sections 12.3 and 12.16, respectively. Lengths are in inches.
3. For compression development lengths, if bars are enclosed in spirals or ties conforming to ACI 318-02, Section 12.3.3(b), then a modification factor of 0.75 may be applied but the resulting length must not be less than 8 in.
4. For compression lap splice lengths:
 - a. If bars are enclosed in a tied-reinforced compression member conforming to ACI 318-02, Section 12.17.2.4, then a modification factor of 0.83 may be applied but the resulting length must not be less than 12 in.
 - b. If bars are enclosed in a spirally-reinforced compression member conforming to ACI 318-02, Section 12.17.2.5, then a modification factor of 0.75 may be applied but the resulting length must not be less than 12 in.
 - c. The tabulated lengths are applicable for all concrete strengths of at least 3,000 psi.
5. ACI 318-02 does not allow lap splices of #14 [#43] and #18 [#57] bars.