

Table 3.3-1
MINIMUM MECHANICAL PROPERTIES FOR ALUMINUM ALLOYS

ALLOY AND TEMPER	PRODUCT	THICKNESS RANGE in.	F_{tu} ksi	F_{ty} ksi	F_{cy} ksi	F_{su} ksi	COMPRESSIVE MODULUS OF ELASTICITY ² E (ksi)
5052-O	Sheet & Plate	0.006 to 3.000	25	9.5	9.5	16	10,200
-H32	(Sheet & Plate Cold Fin. Rod & Bar Drawn Tube Sheet)	All	31	23	21	19	10,200
-H34		All	34	26	24	20	10,200
-H36		0.006 to 0.162	37	29	26	22	10,200
		0.006 to 0.162	37	29	26	22	10,200
5083-O	Extrusions	up thru 5.000	39	16	16	24	10,400
-H111	Extrusions	up thru 0.500	40	24	21	24	10,400
-H111	Extrusions	0.501 to 5.000	40	24	21	23	10,400
-O	Sheet & Plate	0.051 to 1.500	40	18	18	25	10,400
-H116	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H32, H321	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H116	Plate	1.501 to 3.000	41	29	24	24	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	24	24	10,400
5086-O	Extrusions	up thru 5.000	35	14	14	21	10,400
-H111	Extrusions	up thru 0.500	36	21	18	21	10,400
-H111	Extrusions	0.501 to 5.000	36	21	18	21	10,400
-O	Sheet & Plate	0.020 to 2.000	35	14	14	21	10,400
-H112	Plate	0.025 to 0.499	36	18	17	22	10,400
-H112	Plate	0.500 to 1.000	35	16	16	21	10,400
-H112	Plate	1.001 to 2.000	35	14	15	21	10,400
-H112	Plate	2.001 to 3.000	34	14	15	21	10,400
-H116	Sheet & Plate	All	40	28	26	24	10,400
-H32	Sheet & Plate	All	40	28	26	24	10,400
	Drawn Tube						
-H34	Sheet & Plate	All	44	34	32	26	10,400
	Drawn Tube						
5154-H38	Sheet	0.006 to 0.128	45	35	33	24	10,300
5454-O	Extrusions	up thru 5.000	31	12	12	19	10,400
-H111	Extrusions	up thru 0.500	33	19	16	20	10,400
-H111	Extrusions	0.501 to 5.000	33	19	16	19	10,400
-H112	Extrusions	up thru 5.000	31	12	13	19	10,400
-O	Sheet & Plate	0.020 to 3.000	31	12	12	19	10,400
-H32	Sheet & Plate	0.020 to 2.000	36	26	24	21	10,400
-H34	Sheet & Plate	0.020 to 1.000	39	29	27	23	10,400
5456-O	Sheet & Plate	0.051 to 1.500	42	19	19	26	10,400
-H116	Sheet & Plate	0.188 to 1.250	46	33	27	27	10,400
-H32, H321	Sheet & Plate	0.188 to 1.250	46	33	27	27	10,400
-H116	Plate	1.251 to 1.500	44	31	25	25	10,400
-H32, H321	Plate	1.251 to 1.500	44	31	25	25	10,400
-H116	Plate	1.501 to 3.000	41	29	25	25	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	25	25	10,400
6005-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
6061-T6, T651	Sheet & Plate	0.010 to 4.000	42	35	35	27	10,100
-T6, T6510, T6511	Extrusions	All	38	35	35	24	10,100
-T6, T651	Cold Fin. Rod & Bar	up thru 8.000	42	35	35	25	10,100
-T6	Drawn Tube	0.025 to 0.500	42	35	35	27	10,100
-T6	Pipe	All	38	35	35	24	10,100
6063-T5,	Extrusions	up thru 0.500	22	16	16	13	10,100
-T52	Extrusions	up thru 1.000	22	16	16	13	10,100
-T5	Extrusions	0.500 to 1.000	21	15	15	12	10,100
-T6	Extrusions & Pipe	All	30	25	25	19	10,100
6066-T6, T6510, T6511	Extrusions	All	50	45	45	27	10,100
6070-T6, T62	Extrusions	up thru 2.999	48	45	45	29	10,100
6105-T5	Extrusions	up thru 0.500	38	35	35	24	10,100
6351-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
6351-T6	Extrusions	up thru 0.750	42	37	37	27	10,100
6463-T6	Extrusions	up thru 0.500	30	25	25	19	10,100
7005-T53	Extrusions	up thru 0.750	50	44	43	28	10,500

1. F_{tu} and F_{ty} are minimum specified values (except F_{ty} for 1100-H12, H14 Cold Finished Rod and Bar and Drawn Tube, Alclad 3003-H18 Sheet and 5050-H32, H34 Cold Finished Rod and Bar which are minimum expected values); other strength properties are corresponding minimum expected values.

2. Typical values. For deflection calculations an average modulus of elasticity is used; this is 100 ksi lower than values in this column.

**Table 3.3-1
MINIMUM MECHANICAL PROPERTIES FOR ALUMINUM ALLOYS**

ALLOY AND TEMPER	PRODUCT	THICKNESS RANGE in.	F_{tu} ksi	F_{ty} ksi	F_{cy} ksi	F_{su} ksi	COMPRESSIVE MODULUS OF ELASTICITY ² E (ksi)
5052-O	Sheet & Plate	0.006 to 3.000	25	9.5	9.5	16	10,200
-H32	(Sheet & Plate Cold Fin. Rod & Bar Drawn Tube Sheet)	All	31	23	21	19	10,200
-H34		All	34	26	24	20	10,200
-H36		0.006 to 0.162	37	29	26	22	10,200
		0.006 to 0.162	37	29	26	22	10,200
5083-O	Extrusions	up thru 5.000	39	16	16	24	10,400
-H111	Extrusions	up thru 0.500	40	24	21	24	10,400
-H111	Extrusions	0.501 to 5.000	40	24	21	23	10,400
-O	Sheet & Plate	0.051 to 1.500	40	18	18	25	10,400
-H116	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H32, H321	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H116	Plate	1.501 to 3.000	41	29	24	24	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	24	24	10,400
5086-O	Extrusions	up thru 5.000	35	14	14	21	10,400
-H111	Extrusions	up thru 0.500	36	21	18	21	10,400
-H111	Extrusions	0.501 to 5.000	36	21	18	21	10,400
-O	Sheet & Plate	0.020 to 2.000	35	14	14	21	10,400
-H112	Plate	0.025 to 0.499	36	18	17	22	10,400
-H112	Plate	0.500 to 1.000	35	16	16	21	10,400
-H112	Plate	1.001 to 2.000	35	14	15	21	10,400
-H112	Plate	2.001 to 3.000	34	14	15	21	10,400
-H116	Sheet & Plate	All	40	28	26	24	10,400
-H32	Sheet & Plate	All	40	28	26	24	10,400
	Drawn Tube						
-H34	Sheet & Plate	All	44	34	32	26	10,400
	Drawn Tube						
5154-H38	Sheet	0.006 to 0.128	45	35	33	24	10,300
5454-O	Extrusions	up thru 5.000	31	12	12	19	10,400
-H111	Extrusions	up thru 0.500	33	19	16	20	10,400
-H111	Extrusions	0.501 to 5.000	33	19	16	19	10,400
-H112	Extrusions	up thru 5.000	31	12	13	19	10,400
-O	Sheet & Plate	0.020 to 3.000	31	12	12	19	10,400
-H32	Sheet & Plate	0.020 to 2.000	36	26	24	21	10,400
-H34	Sheet & Plate	0.020 to 1.000	39	29	27	23	10,400
5456-O	Sheet & Plate	0.051 to 1.500	42	19	19	26	10,400
-H116	Sheet & Plate	0.188 to 1.250	46	33	27	27	10,400
-H32, H321	Sheet & Plate	0.188 to 1.250	46	33	27	27	10,400
-H116	Plate	1.251 to 1.500	44	31	25	25	10,400
-H32, H321	Plate	1.251 to 1.500	44	31	25	25	10,400
-H116	Plate	1.501 to 3.000	41	29	25	25	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	25	25	10,400
6005-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
6061-T6, T651	Sheet & Plate	0.010 to 4.000	42	35	35	27	10,100
-T6, T6510, T6511	Extrusions	All	38	35	35	24	10,100
-T6, T651	Cold Fin. Rod & Bar	up thru 8.000	42	35	35	25	10,100
-T6	Drawn Tube	0.025 to 0.500	42	35	35	27	10,100
-T6	Pipe	All	38	35	35	24	10,100
6063-T5,	Extrusions	up thru 0.500	22	16	16	13	10,100
-T52	Extrusions	up thru 1.000	22	16	16	13	10,100
-T5	Extrusions	0.500 to 1.000	21	15	15	12	10,100
-T6	Extrusions & Pipe	All	30	25	25	19	10,100
6066-T6, T6510, T6511	Extrusions	All	50	45	45	27	10,100
6070-T6, T62	Extrusions	up thru 2.999	48	45	45	29	10,100
6105-T5	Extrusions	up thru 0.500	38	35	35	24	10,100
6351-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
6351-T6	Extrusions	up thru 0.750	42	37	37	27	10,100
6463-T6	Extrusions	up thru 0.500	30	25	25	19	10,100
7005-T53	Extrusions	up thru 0.750	50	44	43	28	10,500

1. F_{tu} and F_{ty} are minimum specified values (except F_{ty} for 1100-H12, H14 Cold Finished Rod and Bar and Drawn Tube, Alclad 3003-H18 Sheet and 5050-H32, H34 Cold Finished Rod and Bar which are minimum expected values); other strength properties are corresponding minimum expected values.

2. Typical values. For deflection calculations an average modulus of elasticity is used; this is 100 ksi lower than values in this column.

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5052-O	Sheet & Plate	0.006 to 3.000	25	9.5	9.5	16	10,200
-H32	(Sheet & Plate Cold Fin. Rod & Bar Drawn Tube Sheet)	All	31	23	21	19	10,200
-H34		All	34	26	24	20	10,200
-H36		0.006 to 0.162	37	29	26	22	10,200
		0.006 to 0.162	37	29	26	22	10,200
5083-O	Extrusions	up thru 5.000	39	16	16	24	10,400
-H111	Extrusions	up thru 0.500	40	24	21	24	10,400
-H111	Extrusions	0.501 to 5.000	40	24	21	23	10,400
-O	Sheet & Plate	0.051 to 1.500	40	18	18	25	10,400
-H116	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H32, H321	Sheet & Plate	0.188 to 1.500	44	31	26	26	10,400
-H116	Plate	1.501 to 3.000	41	29	24	24	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	24	24	10,400
5086-O	Extrusions	up thru 5.000	35	14	14	21	10,400
-H111	Extrusions	up thru 0.500	36	21	18	21	10,400
-H111	Extrusions	0.501 to 5.000	36	21	18	21	10,400
-O	Sheet & Plate	0.020 to 2.000	35	14	14	21	10,400
-H112	Plate	0.025 to 0.499	36	18	17	22	10,400
-H112	Plate	0.500 to 1.000	35	16	16	21	10,400
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-H116	Sheet & Plate	All	40	28	26	24	10,400
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-H111	Extrusions	up thru 0.500	33	19	16	20	10,400
-H111	Extrusions	0.501 to 5.000	33	19	16	19	10,400
-H112	Extrusions	up thru 5.000	31	12	13	19	10,400
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-H32	Sheet & Plate	0.020 to 2.000	36	26	24	21	10,400
-H34	Sheet & Plate	0.020 to 1.000	39	29	27	23	10,400
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-H116	Plate	1.501 to 3.000	41	29	25	25	10,400
-H32, H321	Plate	1.501 to 3.000	41	29	25	25	10,400
6005-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
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-T6, T6510, T6511	Extrusions	All	38	35	35	24	10,100
-T6, T651	Cold Fin. Rod & Bar	up thru 8.000	42	35	35	25	10,100
-T6	Drawn Tube	0.025 to 0.500	42	35	35	27	10,100
-T6	Pipe	All	38	35	35	24	10,100
6063-T5,	Extrusions	up thru 0.500	22	16	16	13	10,100
-T52	Extrusions	up thru 1.000	22	16	16	13	10,100
-T5	Extrusions	0.500 to 1.000	21	15	15	12	10,100
-T6	Extrusions & Pipe	All	30	25	25	19	10,100
6066-T6, T6510, T6511	Extrusions	All	50	45	45	27	10,100
6070-T6, T62	Extrusions	up thru 2.999	48	45	45	29	10,100
6105-T5	Extrusions	up thru 0.500	38	35	35	24	10,100
6351-T5	Extrusions	up thru 1.000	38	35	35	24	10,100
6351-T6	Extrusions	up thru 0.750	42	37	37	27	10,100
6463-T6	Extrusions	up thru 0.500	30	25	25	19	10,100
7005-T53	Extrusions	up thru 0.750	50	44	43	28	10,500

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