

Twin City Fan & Blower

SOUND POWER LEVELS

MIXED FLOW FANS

TYPE QSL, QSLR & QSLSH



Twin City Fan & Blower certifies that the Type QSL, QSLR and QSLSH Mixed Flow Fans shown herein are licensed to bear the AMCA Seal. The ratings shown are based on tests and procedures performed in accordance with AMCA Publication 211 and AMCA Publication 311 and comply with the requirements of the AMCA Certified Ratings Program.

Air performance ratings can be found in Bulletin 1060.



Sound power levels (Lw) have been determined by laboratory tests in accordance with AMCA Standard 300-96. The sound power levels shown are decibel (dB) levels referred to 10⁻¹² watts calculated per AMCA Standard 301. The AMCA certified Ratings Seal applies to 'A' Weight Lw (LwA) at inlet (LwiA) & outlet (LwoA) only. Procedure to obtain LwA is shown below. We have listed inlet and outlet values for eight octave bands with frequency ranges as shown below.

OCTAVE BAND	1	2	3	4	5	6	7	8
FREQUENCY RANGE	45 to 90	90 to 180	180 to 355	355 to 710	710 to 1400	1400 to 2800	2800 to 5600	5600 to 11200
CENTER FREQUENCY	63	125	250	500	1000	2000	4000	8000

Lw for the fans can be easily obtained using the Twin City Fan Selector Program. Lw can also be obtained using the specific sound power level method described below:

Sound Power Level of a fan (Lw) = Specific Sound Power Level (L_{WK}) + Capacity Fraction (M)

Use of this method will be illustrated by the following example:

Calculate sound power levels for:
 Size 222 QSL
 CFM 7,287
 SP 2.21" w.g.
 RPM 1400 RPM

1. How to determine L_{WK}

We have published values for L_{WK} at various speeds and operating points on pages 3 through 5 for both the inlet and outlet of the fan.

The operating point is found by using a ratio of design CFM to the wide open volume (WOV) for a given RPM. The WOVS can be calculated by multiplying fan RPM by the factors (Rf) shown in the table.

SIZE	Rf	SIZE	Rf	SIZE	Rf
150	2.292	270	13.577	490	86.985
165	3.017	300	18.371	542	115.777
182	4.154	330	24.635	600	156.660
200	5.545	365	35.487	660	212.040
222	7.436	402	47.378	730	283.896
245	10.200	445	64.297		

Thus, WOVS for 1400 RPM = 7.436 x 1400 = 10,410 CFM.

Therefore, the operating point falls at 70% WOVS (7,287 ÷ 10,410 x 100%). Referring to the table on page 4 for Size QSL 222, the **specific** sound power levels can be read as follows:

Octave Band	1	2	3	4	5	6	7	8	'A' Weight
L _{WK} inlet =	35	35	32	31	29	26	22	17	34
L _{WK} outlet =	41	38	36	35	32	28	23	17	37

2. How to determine M

M can be calculated by: $M = 10 \log_{10} (CFM) + 20 \log_{10} TP$, where $TP = ((CFM \div OA) \div 4005)^2 + SP = ((7287 \div 4.92) \div 4005)^2 = 2.35$

Thus, for 7,287 CFM and 2.21" SP, M is 46.

3. Combining L_{WK} and M gives sound power levels.

Octave Band	1	2	3	4	5	6	7	8	'A' Weight
L _{WK} =	35	35	32	31	29	26	22	17	34
M =	46	46	46	46	46	46	46	46	46
Lw (Lwi) at inlet =	81	81	78	78	75	72	68	63	80 (LwiA)
L _{WK} =	41	37	36	35	32	28	22	16	37
M =	46	46	46	46	46	46	46	46	46
Lw (Lwo) at outlet =	87	83	82	81	78	74	68	62	83 (LwoA)

**Inlet L_{WK} Values (L_{wki}) —
QSL, QSLR & QSLSH 150–200**

RPM	% WOV	OCTAVE BAND								L _{wkiA}
		1	2	3	4	5	6	7	8	
3390	90	36	38	42	44	45	44	39	32	50
	80	32	34	36	38	39	38	33	26	44
	70	32	33	36	37	38	37	32	25	43
	60	35	35	34	35	35	34	30	23	40
	50	36	35	33	34	34	33	30	23	39
3080	90	36	39	42	44	45	43	38	31	49
	80	32	34	37	38	39	37	32	25	43
	70	32	34	36	37	38	36	31	24	42
	60	35	34	34	35	35	34	29	23	40
	50	36	35	33	34	34	33	29	22	39
2770	90	37	39	43	44	45	42	37	30	49
	80	32	35	37	38	39	37	31	24	43
	70	32	34	36	37	38	36	30	23	42
	60	35	34	34	35	35	33	28	22	39
	50	36	34	34	34	34	33	27	21	38
2460	90	37	40	43	44	45	42	36	28	49
	80	33	35	37	39	39	36	30	23	43
	70	33	35	37	38	38	35	29	22	42
	60	35	34	35	35	35	33	27	21	39
	50	36	33	34	34	34	32	26	20	38
2150	90	39	44	45	46	46	42	36	28	50
	80	34	38	39	40	40	36	30	23	44
	70	34	37	38	39	39	35	29	22	43
	60	35	35	35	35	36	33	27	21	40
	50	36	34	35	34	34	32	26	20	38
1840	90	41	47	47	48	47	42	35	27	51
	80	36	40	40	42	41	36	30	22	45
	70	35	39	39	41	40	35	29	22	44
	60	36	36	36	36	37	33	27	20	40
	50	36	36	35	35	35	32	27	20	39
1530	90	44	49	47	50	47	41	34	26	51
	80	39	42	41	44	41	36	30	21	45
	70	38	41	40	43	40	35	29	20	44
	60	36	37	36	37	36	32	27	18	40
	50	36	36	35	35	35	31	26	18	39
1220	90	47	49	48	50	45	39	32	23	50
	80	41	42	42	43	39	34	27	17	44
	70	40	41	41	42	38	33	26	17	43
	60	37	37	36	37	35	31	25	15	39
	50	36	36	35	36	34	30	24	15	38
910	90	49	48	50	49	43	36	28	19	49
	80	42	41	43	42	37	31	23	13	43
	70	41	40	42	41	36	31	22	13	42
	60	37	37	37	37	33	28	21	12	38
	50	36	36	35	36	32	28	20	11	37
600	90	48	48	49	45	39	32	22	13	46
	80	42	42	43	39	34	27	17	8	40
	70	41	41	42	38	33	26	17	7	39
	60	37	36	37	35	31	24	15	6	36
	50	36	35	36	34	30	24	15	6	35

**Outlet L_{WK} Values (L_{wko}) —
QSL, QSLR & QSLSH 150–200**

RPM	% WOV	OCTAVE BAND								L _{wkoA}
		1	2	3	4	5	6	7	8	
3390	90	54	52	48	49	49	47	41	33	53
	80	51	48	42	43	43	42	35	27	48
	70	51	48	41	42	42	41	34	27	47
	60	54	50	40	40	39	38	32	26	44
	50	56	51	40	39	39	38	31	25	44
3080	90	54	51	49	49	49	46	40	32	53
	80	51	47	43	43	43	41	34	26	47
	70	51	47	42	42	42	40	33	26	46
	60	54	48	40	40	39	37	31	25	44
	50	56	48	40	39	39	37	30	24	44
2770	90	54	49	49	49	49	45	39	31	53
	80	51	45	43	43	43	40	32	25	47
	70	51	45	42	42	42	39	32	25	46
	60	54	45	40	39	39	36	30	24	43
	50	56	45	40	39	38	36	30	23	43
2460	90	55	48	50	49	49	44	37	30	52
	80	51	44	43	43	43	39	31	24	47
	70	51	43	42	42	42	38	31	24	46
	60	54	43	40	39	39	35	29	23	43
	50	55	43	40	39	38	35	29	22	43
2150	90	57	52	50	50	49	44	37	29	53
	80	53	47	43	44	44	38	31	23	47
	70	53	46	43	43	43	37	30	23	46
	60	55	45	40	40	40	35	29	22	44
	50	55	45	40	39	39	34	28	21	43
1840	90	58	54	50	51	50	44	35	28	53
	80	54	49	44	45	44	38	30	23	48
	70	54	49	43	43	43	37	29	22	46
	60	54	47	40	40	40	35	28	21	44
	50	54	47	40	39	39	34	27	20	43
1530	90	60	54	50	52	49	42	34	26	53
	80	56	48	44	46	43	36	28	21	47
	70	55	47	43	44	42	35	28	20	46
	60	55	46	40	40	39	33	26	19	43
	50	54	45	39	39	38	33	26	18	42
1220	90	60	50	51	51	47	39	31	24	52
	80	56	44	44	45	41	34	26	19	46
	70	55	43	43	44	40	33	25	18	45
	60	55	41	40	40	38	31	24	16	42
	50	54	40	39	39	37	31	24	16	41
910	90	57	50	51	51	44	36	28	21	51
	80	52	44	45	45	38	30	23	16	45
	70	51	43	44	44	37	30	22	15	44
	60	50	40	40	40	35	28	21	13	40
	50	50	40	39	39	35	28	20	13	40
600	90	50	51	51	47	39	31	24	17	48
	80	44	44	45	41	33	26	18	11	42
	70	43	43	44	40	33	25	18	10	41
	60	41	40	40	38	31	24	16	9	38
	50	40	39	39	37	30	23	16	8	37

The sound power level ratings obtained are in decibels, referred to 10⁻¹² watts calculated per AMCA Standard 301.

The A-weighted sound ratings obtained have been calculated per AMCA Standard 301.

Values obtained are for inlet L_{wiA} sound power levels for Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

Values obtained are for outlet L_{wkoA} sound power levels for Installation Type B: free inlet, ducted outlet. Ratings include the effects of duct end correction.

The AMCA Certified Ratings Seal applies to L_{wiA} and L_{wkoA} ratings only.

**Inlet L_{WK} Values (L_{wki}) —
QSL, QSLR & QSLSH 222–330**

RPM	% WOV	OCTAVE BAND								L _{wkiA}
		1	2	3	4	5	6	7	8	
2280	90	37	40	42	41	40	38	35	28	45
	80	34	35	36	34	33	31	27	23	38
	70	32	33	33	31	30	28	24	20	35
	60	32	33	33	31	30	28	24	20	35
	50	32	32	33	31	30	27	23	19	35
2060	90	37	40	41	41	39	37	34	28	44
	80	34	35	35	34	33	30	27	22	38
	70	32	34	33	31	30	27	24	20	35
	60	32	33	33	31	30	27	24	20	35
	50	32	33	32	31	29	26	23	19	34
1840	90	38	40	41	41	39	37	33	27	44
	80	34	36	35	34	32	30	26	21	37
	70	32	34	32	31	30	27	23	19	35
	60	32	33	32	31	29	27	23	19	34
	50	32	33	32	31	29	26	22	18	34
1620	90	38	41	41	40	39	36	32	25	43
	80	34	36	34	34	32	29	25	20	37
	70	33	34	31	31	29	26	22	18	34
	60	32	33	31	31	29	26	22	18	34
	50	32	33	32	31	28	25	21	17	33
1400	90	41	42	41	41	39	37	31	25	44
	80	37	37	34	34	32	29	25	19	37
	70	35	35	32	31	29	26	22	17	34
	60	35	35	32	31	29	26	22	17	34
	50	35	34	32	31	28	25	21	16	33
1180	90	45	43	42	40	39	37	30	24	44
	80	40	37	35	34	32	30	24	17	37
	70	38	35	33	31	29	27	21	14	34
	60	38	35	33	31	29	27	21	14	34
	50	38	35	33	31	28	26	21	14	34
960	90	46	43	42	40	39	36	29	24	43
	80	41	37	36	33	32	29	22	15	37
	70	39	35	34	31	30	26	19	11	34
	60	39	35	33	31	29	26	19	11	34
	50	39	35	33	30	28	25	19	12	33
740	90	44	42	42	39	38	33	27	22	42
	80	39	36	36	33	31	26	19	12	36
	70	37	34	33	30	29	23	16	9	33
	60	37	34	33	30	28	23	16	9	33
	50	37	34	32	29	27	23	16	9	32
520	90	43	42	40	39	37	30	24	19	41
	80	38	36	34	33	30	23	16	9	34
	70	35	34	31	30	27	20	12	5	31
	60	35	33	31	29	27	20	12	5	31
	50	35	33	31	28	26	20	13	6	30
320	90	42	41	39	38	32	26	21	16	38
	80	36	35	33	31	25	18	11	5	32
	70	34	32	30	28	22	14	7	0	28
	60	33	32	30	28	22	14	7	0	28
	50	33	32	29	27	22	15	8	2	28

**Outlet L_{WK} Values (L_{wko}) —
QSL, QSLR & QSLSH 222–330**

RPM	% WOV	OCTAVE BAND								L _{wkoA}
		1	2	3	4	5	6	7	8	
2280	90	47	47	44	45	44	40	35	29	48
	80	43	43	37	38	37	33	28	23	41
	70	41	41	35	35	34	31	25	20	38
	60	41	41	35	35	34	31	25	20	38
	50	41	41	37	35	34	31	26	20	39
2060	90	47	46	44	45	43	40	35	28	48
	80	43	42	37	38	37	33	28	22	41
	70	41	40	35	35	34	30	25	19	38
	60	41	40	35	35	34	30	25	19	38
	50	41	40	36	35	34	30	25	19	38
1840	90	47	46	44	45	43	39	34	27	47
	80	43	41	38	38	36	32	27	21	40
	70	41	39	35	35	33	29	24	18	38
	60	41	39	35	35	33	29	24	18	38
	50	41	40	36	35	34	29	24	19	38
1620	90	47	45	45	45	42	38	33	26	47
	80	43	40	38	38	35	31	26	20	40
	70	41	37	35	35	33	28	23	17	37
	60	41	38	35	35	33	28	23	17	37
	50	41	39	36	35	33	28	23	18	37
1400	90	48	46	46	44	41	38	32	25	46
	80	43	40	39	38	35	31	25	19	40
	70	41	37	36	35	32	28	22	16	37
	60	41	38	36	35	32	28	22	16	37
	50	42	39	36	35	32	28	22	17	37
1180	90	49	48	46	43	41	38	30	23	46
	80	44	41	39	37	34	30	24	17	39
	70	41	38	36	34	31	27	21	15	36
	60	41	38	36	34	31	27	21	15	36
	50	42	40	36	34	31	27	22	15	36
960	90	50	49	46	42	40	36	28	21	45
	80	44	42	39	36	33	29	22	15	38
	70	41	39	36	33	30	26	20	13	35
	60	41	39	36	33	30	26	20	13	35
	50	42	39	35	33	30	26	20	13	35
740	90	50	48	44	42	39	33	25	18	44
	80	43	40	38	35	32	27	19	13	37
	70	40	37	35	32	29	24	17	11	34
	60	41	37	35	32	29	24	17	11	34
	50	42	38	34	32	29	24	17	11	34
520	90	49	46	43	41	37	29	22	15	42
	80	42	39	36	34	30	23	16	10	35
	70	39	36	33	31	27	20	14	8	32
	60	39	36	33	31	27	20	14	8	32
	50	40	36	33	30	27	21	14	8	32
320	90	47	44	41	39	32	24	17	11	39
	80	40	37	34	31	25	18	12	6	32
	70	37	34	32	29	22	16	10	3	30
	60	37	34	31	28	22	16	10	3	29
	50	37	34	31	28	23	16	10	4	29

The sound power level ratings obtained are in decibels, referred to 10⁻¹² watts calculated per AMCA Standard 301.

The A-weighted sound ratings obtained have been calculated per AMCA Standard 301.

Values obtained are for inlet L_{wiA} sound power levels for Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

Values obtained are for outlet L_{wkoA} sound power levels for Installation Type B: free inlet, ducted outlet. Ratings include the effects of duct end correction.

The AMCA Certified Ratings Seal applies to L_{wiA} and L_{wkoA} ratings only.

**Inlet L_{wk} Values (L_{wki}) —
QSL, QSLR & QSLSH 365–730**

RPM	% WOV	OCTAVE BAND								L _{wki} A
		1	2	3	4	5	6	7	8	
1410	90	37	45	42	41	41	38	30	24	45
	80	33	39	35	33	33	30	23	19	37
	70	31	37	33	31	30	27	21	17	35
	60	32	37	33	31	29	26	21	17	34
	50	35	38	34	30	29	26	21	18	34
1270	90	37	47	42	41	41	38	29	23	45
	80	33	40	35	33	32	29	22	18	37
	70	31	38	32	31	30	26	20	17	34
	60	32	38	33	30	29	26	20	17	34
	50	35	38	33	30	28	25	21	17	33
1130	90	40	46	42	41	40	36	27	22	44
	80	35	39	35	33	32	28	22	17	36
	70	33	37	32	30	29	25	19	16	33
	60	34	37	32	30	29	25	20	16	33
	50	35	37	33	30	28	24	20	16	33
990	90	42	45	42	40	39	33	26	20	43
	80	37	38	35	33	31	26	21	17	36
	70	36	36	32	30	28	23	19	15	33
	60	36	36	32	30	28	23	19	15	33
	50	36	36	33	29	27	23	19	16	32
850	90	44	44	42	39	36	31	24	19	41
	80	39	38	35	32	29	24	19	16	34
	70	37	35	32	29	26	22	18	14	32
	60	37	35	32	29	26	22	18	14	32
	50	36	35	32	28	26	22	18	15	31
710	90	45	44	41	38	35	29	22	17	40
	80	40	37	34	31	28	23	18	15	33
	70	38	34	31	28	25	20	17	14	30
	60	37	34	31	28	25	20	17	14	30
	50	36	35	31	27	25	20	17	14	30
570	90	45	43	40	37	34	27	21	16	39
	80	39	36	33	31	27	21	17	14	33
	70	37	33	30	28	24	19	16	12	30
	60	37	33	30	27	24	19	16	13	29
	50	36	34	30	27	24	19	16	13	30
430	90	44	42	39	36	31	24	19	14	37
	80	38	35	32	29	24	19	16	12	31
	70	35	32	29	26	22	18	14	11	28
	60	35	32	29	26	22	18	14	11	28
	50	35	32	28	26	22	18	15	11	28
290	90	43	40	37	34	27	21	16	11	35
	80	36	33	31	27	21	17	14	10	29
	70	33	30	28	24	19	16	13	9	26
	60	33	30	28	24	19	16	13	9	26
	50	34	30	27	24	19	16	13	10	26
150	90	40	38	34	27	21	16	12	7	30
	80	33	31	27	21	18	14	10	6	25
	70	31	28	24	19	16	13	9	6	22
	60	30	28	24	19	16	13	9	6	22
	50	30	27	24	19	16	13	10	6	22

**Outlet L_{wk} Values (L_{wko}) —
QSL, QSLR & QSLSH 365–730**

RPM	% WOV	OCTAVE BAND								L _{wko} A
		1	2	3	4	5	6	7	8	
1410	90	47	49	48	47	45	41	34	27	49
	80	41	45	42	41	40	35	27	21	44
	70	41	42	40	39	37	33	26	20	41
	60	39	37	36	36	33	29	23	17	38
	50	39	37	36	36	33	29	23	17	38
1270	90	47	49	47	47	45	41	32	26	49
	80	42	46	42	41	39	34	26	21	43
	70	41	42	39	39	37	32	24	19	41
	60	39	36	36	35	33	28	22	16	37
	50	39	36	36	35	33	28	22	16	37
1130	90	48	49	47	46	44	39	31	25	48
	80	43	45	41	40	38	33	25	19	42
	70	42	43	39	38	36	31	23	18	40
	60	41	39	36	35	32	27	21	15	37
	50	41	39	36	35	32	27	21	15	37
990	90	50	49	46	45	42	37	29	23	47
	80	44	44	40	40	37	31	23	17	41
	70	44	42	38	37	34	29	22	16	39
	60	44	40	35	34	31	26	20	14	36
	50	44	40	35	34	31	26	20	14	36
850	90	51	47	46	44	41	34	26	21	46
	80	45	41	40	38	35	28	21	15	40
	70	46	40	38	36	33	27	20	14	38
	60	46	38	35	33	30	24	18	13	35
	50	46	38	35	33	30	24	18	13	35
710	90	51	45	46	43	39	32	24	19	44
	80	46	39	40	37	33	26	19	14	38
	70	46	37	38	35	31	25	18	13	37
	60	47	35	34	32	29	23	17	12	34
	50	47	35	34	32	29	23	17	12	34
570	90	50	45	45	42	37	29	22	17	43
	80	45	39	39	36	31	24	17	12	37
	70	45	38	37	34	30	23	17	11	36
	60	45	35	34	31	27	21	15	10	33
	50	45	35	34	31	27	21	15	10	33
430	90	47	46	44	40	34	26	20	15	41
	80	41	40	38	34	28	21	15	10	35
	70	40	38	36	33	27	20	14	9	34
	60	39	35	33	30	25	18	13	8	31
	50	39	35	33	30	25	18	13	8	31
290	90	45	45	42	37	29	23	18	12	38
	80	39	39	36	31	24	18	12	7	33
	70	37	37	34	30	23	17	11	6	31
	60	35	34	31	27	21	15	10	5	28
	50	35	34	31	27	21	15	10	5	28
150	90	45	43	38	30	23	18	13	8	34
	80	39	36	32	24	18	13	7	2	28
	70	37	35	30	23	17	12	6	1	26
	60	34	32	27	21	15	10	5	0	24
	50	34	32	27	21	15	10	5	0	24

The sound power level ratings obtained are in decibels, referred to 10⁻¹² watts calculated per AMCA Standard 301.

The A-weighted sound ratings obtained have been calculated per AMCA Standard 301.

Values obtained are for inlet L_{wi}A sound power levels for Installation Type B: free inlet, ducted outlet. Ratings do not include the effects of duct end correction.

Values obtained are for outlet L_{wo}A sound power levels for Installation Type B: free inlet, ducted outlet. Ratings include the effects of duct end correction.

The AMCA Certified Ratings Seal applies to L_{wi}A and L_{wo}A ratings only.

M Capacity Fraction

CFM	TOTAL PRESSURE AT DENSITY																		
	1/4	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2
100	8	11	14	16	18	19	20	22	24	26	28	30	31	32	33	34	35	36	36
150	10	13	16	18	19	21	22	24	25	28	30	31	33	34	35	36	37	37	38
200	11	14	17	19	21	22	23	25	27	29	31	33	34	35	36	37	38	39	39
300	13	16	19	21	22	24	25	27	28	31	33	34	36	37	38	39	40	40	41
500	15	18	21	23	24	26	27	29	31	33	35	37	38	39	40	41	42	43	43
750	17	20	23	25	26	28	29	31	32	35	37	38	40	41	42	43	44	44	45
1000	18	21	24	26	28	29	30	32	34	36	38	40	41	42	43	44	45	46	46
1500	20	23	26	28	29	31	32	34	35	38	40	41	43	44	45	46	47	47	48
2000	21	24	27	29	31	32	33	35	37	39	41	43	44	45	46	47	48	49	49
3000	23	26	29	31	32	34	35	37	38	41	43	44	46	47	48	49	50	50	51
5000	25	28	31	33	34	36	37	39	41	43	45	47	48	49	50	51	52	53	53
7500	27	30	33	35	36	38	39	41	42	45	47	48	50	51	52	53	54	54	55
10000	28	31	34	36	38	39	40	42	44	46	48	50	51	52	53	54	55	56	56
15000	30	33	36	38	39	41	42	44	45	48	50	51	53	54	55	56	57	57	58
20000	31	34	37	39	41	42	43	45	47	49	51	53	54	55	56	57	58	59	59
30000	33	36	39	41	42	44	45	47	48	51	53	54	56	57	58	59	60	60	61
50000	35	38	41	43	44	46	47	49	51	53	55	57	58	59	60	61	62	63	63
75000	37	40	43	45	46	48	49	51	52	55	57	58	60	61	62	63	64	64	65
100000	38	41	44	46	48	49	50	52	54	56	58	60	61	62	63	64	65	66	66
150000	40	43	46	48	49	51	52	54	55	58	60	61	63	64	65	66	67	67	68
200000	41	44	47	49	51	52	53	55	57	59	61	63	64	65	66	67	68	69	69

CFM	TOTAL PRESSURE AT DENSITY																		
	7	8	9	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
100	37	38	39	40	42	43	44	45	46	47	48	48	49	50	50	51	51	52	52
150	39	40	41	42	43	45	46	47	48	49	49	50	51	51	52	52	53	53	54
200	40	41	42	43	45	46	47	48	49	50	51	51	52	53	53	54	54	55	55
300	42	43	44	45	46	48	49	50	51	52	52	53	54	54	55	55	56	56	57
500	44	45	46	47	49	50	51	52	53	54	55	55	56	57	57	58	58	59	59
750	46	47	48	49	50	52	53	54	55	56	56	57	58	58	59	59	60	60	61
1000	47	48	49	50	52	53	54	55	56	57	58	58	59	60	60	61	61	62	62
1500	49	50	51	52	53	55	56	57	58	59	59	60	61	61	62	62	63	63	64
2000	50	51	52	53	55	56	57	58	59	60	61	61	62	63	63	64	64	65	65
3000	52	53	54	55	56	58	59	60	61	62	62	63	64	64	65	65	66	66	67
5000	54	55	56	57	59	60	61	62	63	64	65	65	66	67	67	68	68	69	69
7500	56	57	58	59	60	62	63	64	65	66	66	67	68	68	69	69	70	70	71
10000	57	58	59	60	62	63	64	65	66	67	68	68	69	70	70	71	71	72	72
15000	59	60	61	62	63	65	66	67	68	69	69	70	71	71	72	72	73	73	74
20000	60	61	62	63	65	66	67	68	69	70	71	71	72	73	73	74	74	75	75
30000	62	63	64	65	66	68	69	70	71	72	72	73	74	74	75	75	76	76	77
50000	64	65	66	67	69	70	71	72	73	74	75	75	76	77	77	78	78	79	79
75000	66	67	68	69	70	72	73	74	75	76	76	77	78	78	79	79	80	80	81
100000	67	68	69	70	72	73	74	75	76	77	78	78	79	80	80	81	81	82	82
150000	69	70	71	72	73	75	76	77	78	79	79	80	81	81	82	82	83	83	84
200000	70	71	72	73	75	76	77	78	79	80	81	81	82	83	83	84	84	85	85



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