

are considered consistent with good practice, although there are boilers which have high efficiencies and also operate at higher transmission rates.

TESTING AND RATING CODES

The Society has adopted four solid fuel testing codes, a solid fuel rating code, and an oil fuel testing code.

ASHVE Standard and Short Form Heat Balance Codes for Testing Low-Pressure Steam Heating Solid Fuel Boilers—Codes 1 and 2—(Revision of June, 1929),¹ provide a method for conducting and reporting tests to determine heat efficiency and performance characteristics.

ASHVE Performance Test Code for Steam Heating Solid Fuel Boilers—Code No. 3—(Edition of 1929)¹ is intended for use with ASHVE Code (withdrawn in 1953) for Rating Steam Heating Solid Fuel Hand-Fired Boilers.² The object of this test code is to specify the tests to be conducted, and to provide a method for conducting and reporting tests to determine the efficiencies and performance of the boiler.

The ASHVE Standard Code for Testing Steam Heating Boilers Burning Oil Fuel,³ (Adopted June, 1932), provides a standard method for conducting and reporting tests to determine the heating efficiency and performance characteristics when oil fuel is used with steam heating boilers.¹

The ASHVE Standard Code for Testing Stoker-Fired Steam Heating Boilers,⁴ (Adopted June, 1938), provides a test method for determining the efficiency and performance characteristics of any stoker and boiler combination burning any type of solid fuel, such as anthracite or bituminous coal.

The Steel Boiler Institute, Inc. has adopted a Rating Code for Commercial Steel Boilers and Residential Steel Boilers, and for Testing Oil-Fired Residential Steel Boilers (Fifth Edition as Revised Jan. 1, 1948). The commercial boilers (defined as those having 129 to 2500 sq ft of heating surface) are rated in square feet (steam) on the basis of heating surface with limitations set for grate area, furnace volume, and furnace height.

TABLE 1. SBI NET RATING DATA FOR RESIDENTIAL STEEL BOILERS—OIL FIRED

SBI NET RATING			Minimum Furnace Volume Cu Ft	Heating Surface Sq Ft
Sq Ft Steam	Sq Ft Water	Btu		
275	440	66000	2.5	16
320	510	77000	2.9	19
400	640	96000	3.6	24
550	880	132000	5.0	32
700	1120	168000	6.4	41
900	1440	216000	8.2	53
1100	1760	264000	10.0	65
1300	2080	312000	11.8	77
1500	2400	360000	13.6	88
1800	2880	432000	16.4	108
2200	3520	528000	20.0	129
2600	4160	624000	23.6	153
3000	4800	720000	27.3	177

^a Stoker-fired and Gas-fired SBI Net Rating not greater than Oil-fired. Hand-fired, SBI Net Rating (Steam) not greater than 14 times the square feet of heating surface.

TABLE 2. SBI RATINGS FOR COMMERCIAL STEEL BOILERS

MECHANICALLY FIRED									
SBI Rating					SBI Net Rating				
Sq Ft Steam	Sq Ft Water	Btu	Min. Furnace Volume Cu Ft	Min. Heating Surface Sq Ft	Sq Ft Steam	Sq Ft Water	Btu	Min. Furnace Volume Cu Ft	Min. Heating Surface Sq Ft
2,190	3,500	526,000	15.7	26	1,800	2,880	432,000	15.7	26
2,680	4,280	643,000	19.2	28	2,200	3,520	528,000	19.2	28
3,160	5,050	758,000	22.6	29½	2,600	4,160	624,000	22.6	29½
3,650	5,840	876,000	26.1	29½	3,000	4,800	720,000	26.1	29½
4,250	6,800	1,020,000	30.4	30	3,500	5,600	840,000	30.4	30
4,860	7,770	1,166,000	34.8	30½	4,000	6,400	960,000	34.8	30½
5,470	8,750	1,313,000	39.1	31½	4,500	7,200	1,080,000	39.1	31½
6,080	9,720	1,459,000	43.5	31½	5,000	8,000	1,200,000	43.5	31½
7,290	11,660	1,750,000	52.1	32½	6,000	9,600	1,440,000	52.1	32½
8,500	13,600	2,040,000	60.8	34	7,000	11,200	1,680,000	60.8	34
10,330	16,520	2,479,000	73.8	35½	8,500	13,600	2,040,000	73.8	35½
12,150	19,440	2,916,000	86.8	37½	10,000	16,000	2,400,000	86.8	37½
15,180	24,280	3,643,000	108.5	40½	12,500	20,000	3,000,000	108.5	40½
18,220	29,150	4,373,000	130.2	43	15,000	24,000	3,600,000	130.2	43
21,250	34,000	5,100,000	151.8	46	17,500	28,000	4,200,000	151.8	46
24,290	38,860	5,830,000	173.5	48½	20,000	32,000	4,800,000	173.5	48½
30,360	48,570	7,286,000	216.9	54½	25,000	40,000	6,000,000	216.9	54½
36,430	58,280	8,743,000	260.3	60½	30,000	48,000	7,200,000	260.3	60½
42,500	68,000	10,200,000	303.6	66	35,000	56,000	8,400,000	303.6	66

^a Oil, gas or bituminous stoker-fired coal. Minimum furnace volumes for anthracite, stoker-fired, are not specified in this code.

^b Bituminous, stoker-fired.

^c The tapping sizes shown for boilers having 129 to 500 sq ft of heating surface, inclusive are adequate for forced hot water.

HAND FIRED					SBI Net Rating				
SBI Rating					Sq Ft Steam	Sq Ft Water	Btu	Min. Furnace Volume Cu Ft	Min. Heating Surface Sq Ft
1,800	2,880	432,000	15.7	26	1,800	2,880	432,000	15.7	26
2,200	3,520	528,000	19.2	28	2,200	3,520	528,000	19.2	28
2,600	4,160	624,000	22.6	29½	2,600	4,160	624,000	22.6	29½
3,000	4,800	720,000	26.1	29½	3,000	4,800	720,000	26.1	29½
3,500	5,600	840,000	30.4	30	3,500	5,600	840,000	30.4	30
4,000	6,400	960,000	34.8	30½	4,000	6,400	960,000	34.8	30½
4,500	7,200	1,080,000	39.1	31½	4,500	7,200	1,080,000	39.1	31½
5,000	8,000	1,200,000	43.5	31½	5,000	8,000	1,200,000	43.5	31½
6,000	9,600	1,440,000	52.1	32½	6,000	9,600	1,440,000	52.1	32½
7,000	11,200	1,680,000	60.8	34	7,000	11,200	1,680,000	60.8	34
8,500	13,600	2,040,000	73.8	35½	8,500	13,600	2,040,000	73.8	35½
10,000	16,000	2,400,000	86.8	37½	10,000	16,000	2,400,000	86.8	37½
12,500	20,000	3,000,000	108.5	40½	12,500	20,000	3,000,000	108.5	40½
15,000	24,000	3,600,000	130.2	43	15,000	24,000	3,600,000	130.2	43
17,500	28,000	4,200,000	151.8	46	17,500	28,000	4,200,000	151.8	46
20,000	32,000	4,800,000	173.5	48½	20,000	32,000	4,800,000	173.5	48½
25,000	40,000	6,000,000	216.9	54½	25,000	40,000	6,000,000	216.9	54½
30,000	48,000	7,200,000	260.3	60½	30,000	48,000	7,200,000	260.3	60½
35,000	56,000	8,400,000	303.6	66	35,000	56,000	8,400,000	303.6	66

FLOW TAPPIING					SBI Net Rating				
SBI Rating					Sq Ft Steam	Sq Ft Water	Btu	Min. Furnace Volume Cu Ft	Min. Heating Surface Sq Ft
3	6	360,000	7.9	3	2,400	3,600	540,000	7.9	3
3	6	439,000	8.9	3	2,930	4,390	658,500	8.9	3
3	6	521,000	9.7	3	3,470	5,210	781,500	9.7	3
3	6	600,000	10.5	3	4,000	6,000	900,000	10.5	3
3	6	700,000	11.4	3	4,670	7,000	1,050,000	11.4	3
3	6	800,000	12.2	3	5,330	8,000	1,200,000	12.2	3
3	6	900,000	13.4	3	6,000	9,000	1,350,000	13.4	3
3	6	1,000,000	14.5	3	6,670	1,000,000	1,500,000	14.5	3
3	6	1,200,000	16.4	3	8,000	1,200,000	1,800,000	16.4	3
4	8	1,400,000	18.1	4	9,330	1,400,000	2,100,000	18.1	4
4	8	1,700,000	20.5	4	11,330	1,700,000	2,550,000	20.5	4
4	8	2,000,000	22.5	4	13,330	2,000,000	3,000,000	22.5	4
4	8	2,500,000	25.6	4	16,700	2,500,000	3,750,000	25.6	4
4	8	3,000,000	28.4	4	20,000	3,000,000	4,500,000	28.4	4
4	8	3,500,000	30.9	4	23,330	3,500,000	5,250,000	30.9	4
4	8	4,000,000	33.2	4	26,670	4,000,000	6,000,000	33.2	4
6	10	5,000,000	37.4	6	33,330	5,000,000	7,500,000	37.4	6
6	10	6,000,000	41.2	6	40,000	6,000,000	9,000,000	41.2	6
6	10	7,000,000	44.7	6	46,670	7,000,000	10,500,000	44.7	6