

and in that case it amounts to about three and one-half times normal condensation. After the end of 25 min., the radiator reached a normal rate of condensation. This curve was made from observations at intervals of 10 min. so that the intermediate points between the 10 min. points are not known, and the form of the curve is not exact. It shows, however, that when a plant is initially started up and the system filled with steam during a short period of time the demand made upon the boiler may be very much higher than the normal demand. In practice the rate of steam supply to the radiator while heating-up is however, generally retarded by controlled elimination of air through air valves or traps and if sufficient time is allowed for the heating-up process, overload on the boiler may be practically eliminated.

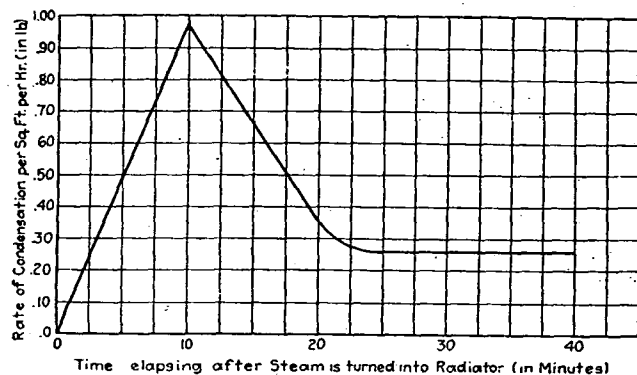


FIG. 2. CHART SHOWS THE STEAM DEMAND RATE FOR HEATING-UP A CAST IRON RADIATOR WITH FREE AIR VENTING AND AMPLE STEAM SUPPLY

EFFECT OF PAINTING CAST IRON RADIATORS

The effect of painting is to change the radiation constant of the radiating surface and has practically no effect upon the heat lost by convection. It is, therefore, a surface effect and it makes no difference what paints are placed on the radiator as a priming coat, the results are always dependent upon the last coat of paint put upon the radiator. In radiators having a large proportion of radiating surface such as pipe coils or wall coils, the effect of painting will be more marked than in four-column radiators having a comparatively small radiating surface in proportion to convecting surface. All finely ground materials have about the same radiation constant. Therefore all paints having finely ground pigments will give about the same effect. Metals have a poor radiating effect so that any paint involving flake metal, such as the bronze, will have a low radiating constant.

The effects of painting a six-section 32-in. three-column radiator as found by Wm. H. Severns are given in Table 7.

TABLE 7. EFFECT OF PAINTING 32-IN. THREE-COLUMN, 6-SECTION CAST IRON RADIATORS*

RADIATOR No.	FINISH	AREA Sq. Ft.	COEFFICIENT OF HEAT TRANS. B.T.U.	RELATIVE HEATING VALUE PER CENT
1	Bare iron, foundry finish.....	27	1.77	100.5
2	One coat of aluminum bronze.....	27	1.60	90.8
3	Gray paint dipped.....	27	1.78	101.1
4	One coat dull black Pecora paint....	27	1.76	100.0

*Comparative tests of Radiator Finishes by Wm. H. Severns, JOURNAL, AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS, January, 1927.

TABLE 8. EFFECT OF ENCLOSURE ON HEAT EMISSION FROM RADIATOR

Enclosure Number	Height of Top of Enclosure Above Top of Radiator	Description of Enclosure	Inlet	Outlet	Free Area of Inlet Sq. In.	Free Area of Outlet Sq. In.	Net Pounds of Steam Condensed in Radiator per Hour	Relative Condensing Capacity Percent	Enclosure Number
1	00"	Radiator not enclosed—Pinned (not dipped) with two coats of black Pecora paint	4" x 50" Across front	9 1/2" x 50" Open top	2000	462.5	21.93	100.0	1
2	00"		4" x 50" Across front	9 1/2" x 50" Grilled top	2000	209.4	19.53	89.1	2
3	00"		4" x 50" Across front	12 1/2" x 50" Open front	2000	625.0	18.98	86.5	3
4	00"		4" x 50" Across front	4" x 50" Open front	2000	2000	18.31	83.5	4
5	00"		4" x 50" Across front	4" x 50" Grilled front	2000	92.1	16.89	77.0	5
6	17 1/2"		4" x 50" Across front	4" x 50" Grilled front	2000	92.1	15.17	69.2	6
7	34"		4" x 50" Across front	4" x 50" Grilled front	2000	92.1	17.46	78.3	7
8	00"		4" x 82 1/2" Across front and ends top	9 1/2" x 50" Grilled front and ends top	3300	209.4	18.77	85.6	8
9	00"		2" x 82 1/2" Across front and ends top	9 1/2" x 50" Grilled front and ends top	1650	209.4	19.43	88.6	9
10	34"		4" x 82 1/2" Across front and ends top	9 1/2" x 50" Open front and ends top	3300	462.5	18.09	82.5	10
11	00"		4" x 82 1/2" Across front and ends top	4" x 50" Grilled front and ends top	3300	92.1	23.92	109.1	11
12	00"		Punctured metal grille front and ends, solid top. Grille-work beginning 4" above floor. F.A. of grille = 44%				15.17	69.2	12
13	00"		Woven metal grille front and ends, solid top. Grille-work beginning 4" above floor. F.A. of grille = 53%				18.47	84.2	13
14	00"		Same as (13) with F.A. of Grille = 42%				18.47	84.2	14

Note: Steam Temperature constant at 216°F. Breathing Line Temperature = 80°F.