

TABLE 1. TYPICAL HEATING AND VENTILATION PRACTICES FOR SHIPS

SPACE	TYPE OF VENTILATION		TYPE OF HEATING	AIR CHANGE MINUTES	REMARKS
	Sup.	Exh.			
Living Quarters.....	Mech.	Mech. or Nat.	H.B. ^a or D.R. ^b	3-6	
Toilets and Showers.....	Nat.	Mech.	D.R.	3-4	
Chart House.....	Mech.	Mech. or Nat.	H.B. or D.R.	5-6	
Office and Similar Spaces.....	Mech.	Mech. or Nat.	H.B. or D.R.	4-6	
Mess Rooms.....	Mech.	Mech. or Nat.	H.B. or D.R.	4-6	May be exhausted through Galleys and Pantries
Dining Salons.....	Mech.	Mech. or Nat.	H.B. or D.R.	3-6	May be exhausted through Galleys and Pantries.
Galley and Pantry.....	Mech. & Nat.	Mech.	T.A. ^c	1/2-1	Tempered Air Supply
Deck Pantries (No Cooking Equipment).....	Mech. & Nat.	Mech.	H.B. or D.R.	3-6	
Stores Spaces (Isolated Locations).....	Mech. or Nat.	Nat. or Mech.		15-30	
Hospital Spaces.....	Mech.	Mech.	H.B. or D.R.	3-4	
Soiled Linens and Oilskin Lockers.....	Nat.	Mech.		6-10	
Shops.....	Mech.	Mech. or Nat.	H.B. or D.R.	4-10	
Group Berthing Spaces.....	Mech.	Mech. or Nat.	H.B. or D.R.	3-6	
CO ₂ Bottle Space.....	Nat.	Mech.		10	
Battery Room.....	Nat.	Mech.	D.R.	2	
Laundry.....	Mech.	Mech.	H.B.	1-4	Tempered Air Supply
Dry Cargo Holds.....	Mech.	Nat. or Mech.		20-30	
Steering Gear Space.....	Mech. or Nat.	Mech.	H.B. or D.R.	2-6	Unit Heater if desired.
Gyro Room.....	Mech.	Nat. or Mech.		3-6	
Theaters and Halls.....	Mech.	Nat. or Mech.	H.B. or D.R.	4-6	
Passageways and Stairwells.....	Nat.	Nat. or Mech.	D.R.	—	Exhausting Adjacent Quarters.
Engine and Boiler Rooms.....	Mech.	Mech. or Nat.		1-2	
Misc. Machinery.....	Mech. or Nat.	Mech.		2-4	
Resistor Spaces.....	Nat.	Mech.		10	

^aH. B.—Hot Blast System.^bD. R.—Direct Radiation.^cT. A.—Tempered Air.

Toilets, Washrooms, Showers and Baths

Spaces for these purposes should be fitted with mechanical exhaust ventilation for odor and steam removal. Generally, the surrounding living or working spaces are exhausted through them. Air requirements on merchant vessels are commonly estimated on the basis of a 4 min rate of change. Where the amount of available air is limited by outside air requirements of air conditioning systems, rates of change as high as one change

in 6 min are used for private bathrooms. On naval vessels, the minimum total quantity of exhaust is that which changes the air within the compartment in 6 min, plus 25 cfm for each toilet fixture, plus 50 cfm for each shower head.

Heat is obtained by use of convector radiators which should maintain a temperature of 70 F.

Galleys, Bakeries, Laundries, and Food Handling Spaces

The problem of the ventilation of spaces fitted for cooking and food preparation is primarily one of heat and smoke or fume removal. Complete mechanical exhaust is always provided, and the mechanical supply is made equivalent to at least 50 per cent of the exhaust. Sufficient natural supply to provide an indraft is required. The exhaust quantities should be predicated on restricting the ambient temperature rise to about 15 deg above the outside summer design air conditions. The resulting quantity will change the air in these spaces in about 3/8 to 1 min. All of the exhaust should be arranged to remove air from the space through hoods fitted over the heat producing equipment. The mechanical supply should blow air directly on the personnel, but away from the equipment and so as not to interfere with the flow of exhaust air to the hoods.

The problem of ventilating laundries is somewhat similar to that for galleys. Experience indicates that the quantity of mechanical supply ventilation should be sufficient to change the air in the spaces in 1 to 4 min. The total exhaust (including tumbler dryers) should be equivalent to at least one air change per minute and at least equal to 120 per cent of the supply so as to insure an indraft of air. Generally, no heat is required for these spaces in winter, but preheaters are provided to temper the supply to between 45 and 60 F.

Storerooms and Cargo Spaces

The ventilation provided for these spaces depends on the type of vessel, location of space, and nature of cargo.

On merchant vessels ventilation is required for all closed spaces. Even if ventilation is not necessary to preserve the stores or cargo, it is required to prevent the accumulation of toxic or combustible gases and putrid odors. One air change in 15 to 30 min is common practice, except where inflammable liquids or proximity to hot spaces requires additional ventilation. Mechanical supply and natural exhaust are usually used. However, where inflammable gases may exist, natural supply and mechanical exhaust are provided.

It is the practice on naval vessels to omit ventilation where it is not necessary to preserve the stores, except for those spaces which hold inflammable liquids. The latter are provided with mechanical exhaust systems and natural supply. As spaces below the waterline are frequently damp, those which are unventilated may require chemical desiccants for removing moisture.

Refrigerated stores and cargo spaces requiring constant temperature and humidity control require special treatment.

AIR CONDITIONING SPACE TREATMENT

The extent of the application of air conditioning to new American passenger ships is fairly well established. All passenger staterooms, except steerage and third class, are usually air conditioned. This includes state-