

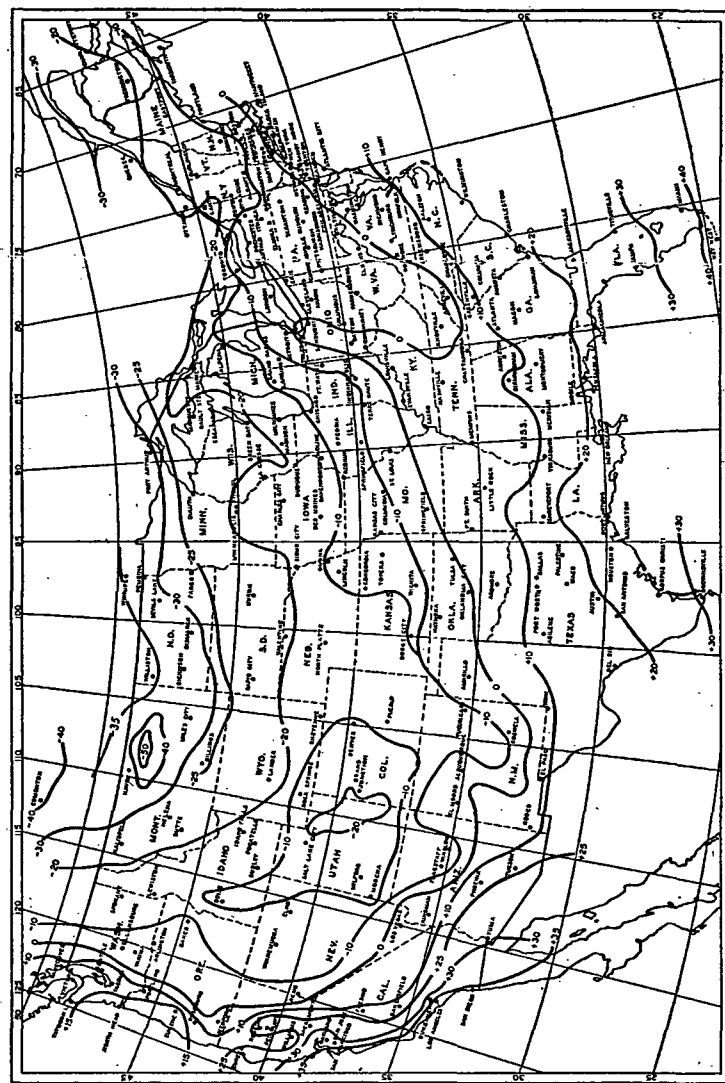


FIG. 1. ISOOTHERMS OF WINTER OUTDOOR DESIGN TEMPERATURE

tremely cold weather, and where no provision is made for humidification, the relative humidity may be 20 percent or less. Consequently, in using the figures listed in Table 2, consideration should be given to the actual relative humidity to be maintained, if provision is to be made for humidification. If no humidification is to be provided, the higher temperatures may not even produce comfort on cold days; if humidity is to be maintained at 50 percent, the lower temperatures will apply.

In rooms having large glass areas, when sun is not shining, or in rooms with walls having a high transmission coefficient, the lowered surface temperature will cause a feeling of coolness even though the air temperature in the room is at or above the temperatures indicated in the table. In rooms of this character, it is desirable to design for even higher temperatures than those listed, unless a compensating high temperature surface is installed to offset the low temperature surfaces.

The inside temperatures specified in Table 2 may be used for panel heated spaces as well as for spaces heated by warm air, radiators or convectors. It is true that warm panel surfaces tend to produce a comfortable environment at a lower room air temperature than when warm panels are not present, but field experience in the United States has indicated that such reductions in air temperature are slight in operation.

TABLE 2. WINTER INSIDE DRY-BULB TEMPERATURES USUALLY SPECIFIED*

TYPE OF BUILDING	DEG F	TYPE OF BUILDING	DEG F
SCHOOLS—		THEATERS—	
Class rooms.....	70-72	Seating space.....	68-72
Assembly rooms.....	68-72	Lounge rooms.....	68-72
Gymnasiums.....	55-65	Toilets.....	68
Toilets and baths.....	70	HOTELS—	
Wardrobe and locker rooms.....	65-68	Bedrooms and baths.....	70
Kitchens.....	66	Dining rooms.....	70
Dining and lunch rooms.....	65-70	Kitchens and laundries.....	66
Playrooms.....	60-65	Ballrooms.....	65-68
Natatoriums.....	75	Toilets and service rooms.....	68
HOSPITALS—		HOMES.....	70-72
Private rooms.....	70-72	STORES.....	65-68
Private rooms (surgical).....	70-80	PUBLIC BUILDINGS.....	68-72
Operating rooms.....	70-95	WARM AIR BATHS.....	120
Wards.....	68	STEAM BATHS.....	110
Kitchens and laundries.....	66	FACTORIES AND MACHINE SHOPS.....	60-65
Toilets.....	68	FOUNDRIES AND BOILER SHOPS.....	50-60
Bathrooms.....	70-80	PAINT SHOPS.....	80

* The most comfortable dry-bulb temperature to be maintained depends on the relative humidity and air motion. These three factors considered together constitute what is termed the *effective temperature*. (See Chapter 6.) When relative humidity is not controlled separately, optimum dry-bulb temperature for comfort will be slightly higher than shown in Table 2.

Temperature at Proper Level. In making the actual heat loss computations, however, for the various rooms in a building it is often necessary to modify the temperatures given in Table 2 so that the air temperature at the proper level will be used. By *air temperature at the proper level* is meant, in the case of walls, the air temperature at the mean height between floor and ceiling; in the case of glass, the air temperature at the mean height of the glass; in the case of roof or ceiling, the air temperature at the mean height of the roof or ceiling above the floor of the heated room; and in the case of floors, the air temperature at the floor level.

Temperature at Ceiling. The air temperature at the ceiling is generally higher than at the breathing level due to stratification of air resulting from the tendency of the warmer or less dense air to rise. An allowance for this fact should be made in calculating ceiling heat losses, particularly in the case of high ceilings. However, the exact allowance to be made may be somewhat difficult to determine as it depends on many factors, including