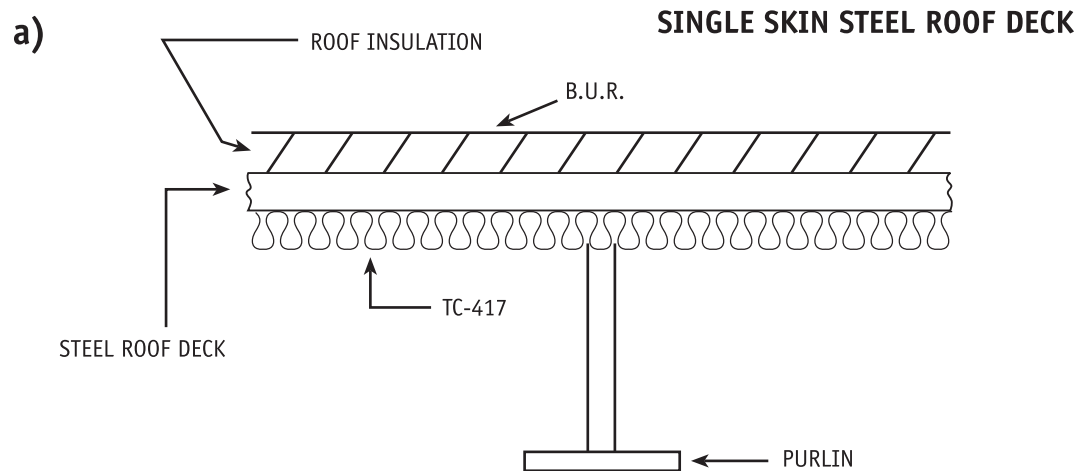




### NOTES:

- a) Please be aware that, in any temperate - or more severe - climate, and in any conditioned building, at least 60% of the total insulation value must be on the cold side of the vapour barrier. This is to prevent condensation forming on the inside of the structure;
- b) The foregoing is a general 'rule of thumb' that can be safely relied upon in most of the cool temperate parts of the world. However, we recommend that, to be sure of the proportions required in any given area, a competent, local HVAC engineering firm be consulted;
- c) In warmer climates, the situation changes. As general ambient temperatures increase, the percentage of insulation placed on the outside (cold) side of the roof skin can be decreased. Eventually, in the case of very hot climates where cooling the building is the major concern, the cold side of the vapour barrier becomes the inside of the building. In those circumstances all the insulation should be on the inside surface of the roof.



### It should be noted that:

- a) In a single skin steel roof assembly with exterior insulation placed on top of the roof panels, they act as the vapour barrier;
- b) In a double skin assembly (diagram b), the lower panels act as the vapour barrier. The upper skin is separated from the insulation by a ventilation channel to eliminate the possibility of condensation in what is, effectively, the exterior insulation.

### In some circumstances, it may be desirable to:

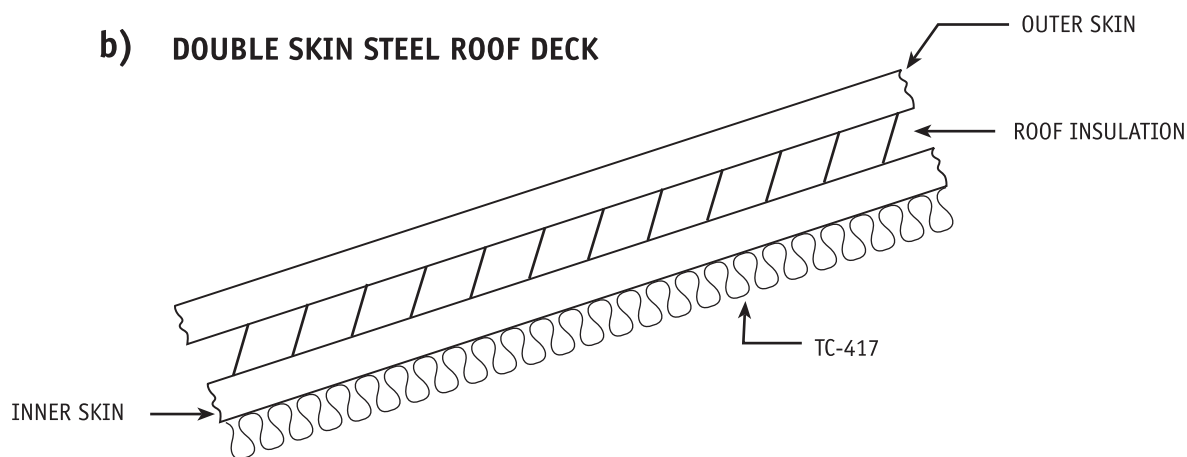
- a) Add more insulation to an existing roof assembly. For instance:
  - To meet upgraded energy code requirements;
  - To improve the effective value of the nominal R (RSI) value of the insulation package. All insulation materials transfer heat by a varying combination of radiation, convection and conduction. By placing some insulation on

the warm side of the vapour barrier, heat loss by convection to the outer insulation is blocked by the vapour barrier.

- b) Lower a roof profile by reducing the thickness of the external insulation;
- c) Improve the building's acoustic performance by

adding **TC-417** to the underside of the roof.

In the examples cited above, **TC-417** can be safely employed as long as our guideline, or overriding professional advice based on specific local conditions, is followed.



### Unconditioned or Minimally Conditioned Buildings

Occasionally it is desirable to add some insulation to an unconditioned, or minimally conditioned, steel-roofed building. This is generally done to solve a condensation problem on the inside of the roof.

**TC-417** is an ideal product to use for this purpose. However, before doing so, the circumstances must be evaluated by a locally based HVAC engineer.

It is necessary to determine what R (RSI) value of insulation applied to the roof will warm it up sufficiently to move the dew point from the inside to the outside surface of the panels. Doing this will eliminate the interior condensation.

#### NOTE:

If too much insulation is added to the underside of the roof, the condensation problem is exacerbated. When the ambient temperature drops sufficiently, the dew point will migrate inward into the insulation and condensation will form. The moisture will be retained within the insulation matrix, and the R (RSI) value will be degraded. Presence of the moisture over long periods can result in insulation fall out and damage to the roof structure.

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