**Q**:  Can the heat transfer coefficient of convection that is automatically or directly calculated for each case below be checked, and what is the calculation method?
- For natural convection, determining automatically
- For natural convection, determining by using a directly entered value
- For forced convection, determining by using specified air flow speed and typical length

**A**: You can select  [Heat transfer coefficient of convection] for the field on the [Results] tab and display its contour diagram to check the automatically calculated values. Those values are calculated according to the rules on the next slide.

# Additional Information

For natural convection where [Automatic Coefficient Calculation] or [Direct Entry] is selected, and for forced convection where the airflow speed 'V 'and the characteristic length 'L' are specified, the rules below are applied.

## Forced Convection

Forced convection

Calculates the heat transfer to environment by forced convection.
Given the air flow speed (V) and the characteristic length (L), the heat transfer coefficient (h) is calculated by:
$h = 3.86 \times (V/L)^{(1/2)}$

## Natural Convection

$con = 2.51 \times C \times (1/L)^{(1/4)}$     (C and L depending on the model object and orientation)

The heat flux is represented with the equation below by using the variable 'con' that is automatically calculated or directly entered.

$con(\theta - \theta_{room})^{(5/4)}$

From this relation, the proportional coefficient, or the heat transfer coefficient, of heat flux to the temperature difference between surface temperature and ambient temperature is determined by multiplying the value of the variable 'con' by the ¼ power of that temperature difference.