

Additional Information
Revision of the approved methodology TH_AM005
“Energy Saving by Introduction of High Efficiency Non-Inverter Type Centrifugal Chiller”

At the time when the methodology TH_AM005 was approved by the Joint Committee in 2017, the American manufacturers such as Company A, B, and C were dominant in the non-inverter type centrifugal chillers market in Thailand as explained in the Additional Information.¹

Research on COP values has been conducted on those three American manufacturers and two Japanese manufacturers Company D and E who produce high efficiency non-inverter type centrifugal chillers with relatively large market shares in Asian.

Research results show that COP values of three manufacturers should be excluded from identification of the reference chiller with the following reasons;

- Company B: Produces only one model of non-inverter type centrifugal chiller considered to be “high-efficiency”, since they are equipped with functions such as multiple stage compressors, economizers and sub coolers as the other high-efficiency centrifugal chillers.
- Company C: Since temperature conditions for COP values are not specified on its product catalogue, COP values are not eligible to be compared with other COP values at the standardized condition.
- Company E: Since COP values are expressed in a range on its product catalogue, COP values are not eligible to be compared with other COP values.

The collected COP values of Company A and D are shown in **Figure 1** below.

It is generally recognised that the chillers with larger cooling capacity tend to have higher energy efficiency than ones with smaller cooling capacity.

Accordingly, three (3) cooling capacity ranges, namely “ $x \leq 600$ ”, “ $600 < x \leq 800$ ” and “ $800 < x \leq 1600$ ” are set to determine the reference COP values for each range. The highest COP values in each range are determined as the reference COP values in a conservative manner (see **Figure 1** and **Table 1**).

¹ https://www.jcm.go.jp/th-jp/methodologies/58/attached_document1

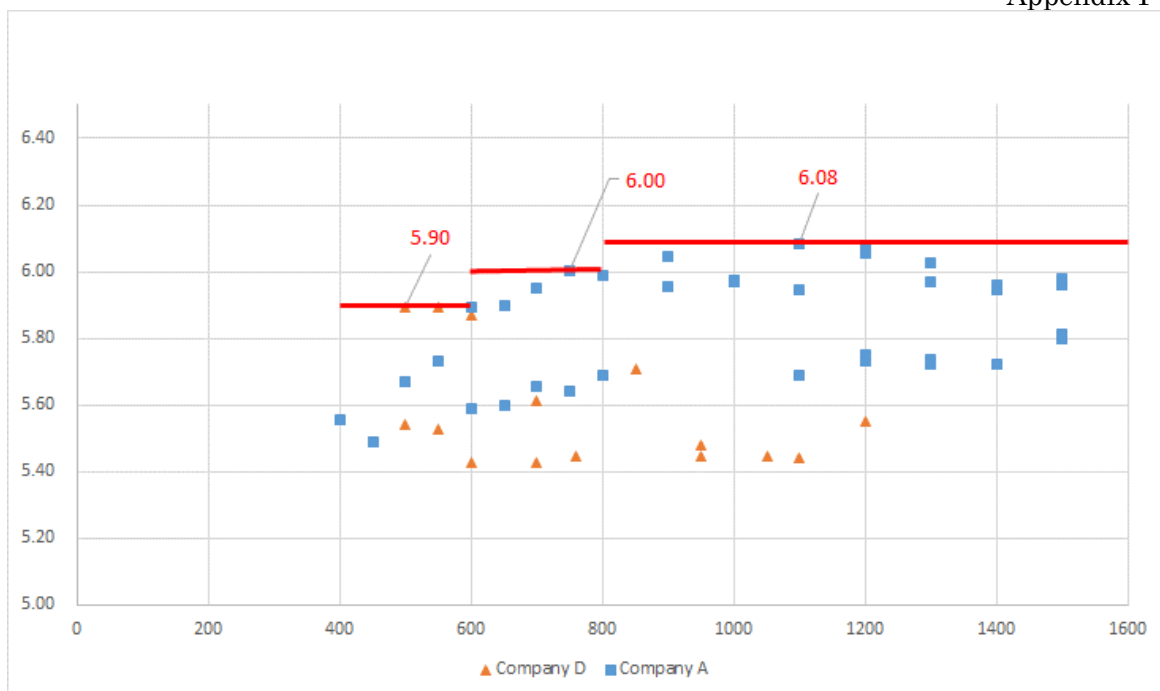


Figure 1: COP values of non-inverter type centrifugal chillers in Thailand

Compared the reference COP values of **Table 1** (recently observed) with those of **Table 2** (currently fixed in TH_AM005), it is observed that COP values have been improved. Therefore, it is proposed to revise the reference COP values in the methodology TH_AM005 to those shown in **Table 1**.

Table 1: Proposed $COP_{RE,i}$ for the revised methodology

Cooling capacity/unit [USRt]	$x \leq 600$	$600 < x \leq 800$	$800 < x \leq 1600$
$COP_{RE,i}$	5.90	6.00	6.08

Source : Data from Company A and D.

Note : “x” in the table represents cooling capacity per unit.

Table 2: Reference $COP_{RE,i}$ for TH_AM005 Version 02.0

Cooling capacity/unit [USRt]	$300 \leq x < 500$	$500 \leq x < 800$	$800 \leq x \leq 1500$
$COP_{RE,i}$	5.67	5.81	6.05