

**Guideline****2/4****CLAP****FORM N°56****Version : 6****Directive 97/23/EC****Keywords :** Heat exchanger

Vessel

Piping

**Directive references:** Article 1 § 2.1.1 - 97/23 EC

Article 1 § 2.1.2 - 97/23 EC

**Adopted by WPG:** 07/09/2004**Adopted by CLAP:** 07/09/2004**Subject:** Classification – Heat exchanger**Question:** Which type of pressure equipment is a heat exchanger?**Answer:** Heat exchangers are considered to be vessels.

As an exception, heat exchangers which consist of straight or bent pipes which may be connected by common circular header(s) made also from pipe are classified according to Article 1 paragraph 2.1.2 last sentence as piping if, and only if, the 3 following conditions are met:

- Air is the secondary fluid,
- They are used in refrigeration systems, in air conditioning systems or in heat pumps,
- The piping aspects are predominant.

For such heat exchangers with headers, the piping aspects are pre-dominant if  $Catp \geq Catv$  where:

$Catp$  = Abstract category that would be applicable according to 97/23/EC if the heat exchanger were classified as piping using DN of the biggest header.

$Catv$  = Abstract category that would be applicable according to 97/23/EC if the biggest header, without the connecting piping, were classified as a vessel (i.e. for determining  $Catv$ , not the total volume  $V$  of the heat exchanger is taken into account, but only the volume  $VH$  of the biggest header).

When the result is  $Catv > Catp$ , the appropriate vessel classification shall be determined by using the volume of the entire heat exchanger (headers plus connecting tubes).

The abstract category approach for determining the predominant aspect is limited to this specific application dealt with in Article 1 paragraph 2.1.2. The use of this concept outside this context is not supported by the directive and thus is not permissible.

NOTE: Piping heat exchangers which do not meet the requirements of the exception are not to be classified according to the last sentence of Article 1 paragraph 2.1.2 as piping; they are to be classified as vessels. For example:

- Heat exchangers which are not used in refrigeration systems, in air conditioning systems or in heat pumps, and for which the main purpose is to heat or cool the contained fluid by using the surrounding air;
- Half-pipe coil or a similar « jacket » construction that heat or cool a vessel;
- Pipe coil that is inside a vessel to heat or cool its content.

Modifications compared to the previous adopted version: copy of guideline 2/4 (07/09/2004).