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THE METHOD OF USING REFERENCE ARROWS AND DESCRIPTIVE GEOMETRY

Gaspard Monge is considered the father of Descriptive Geometry, which is called as mathematical foundation of Engineering Graphics. Monge's idea to project object on two mutually perpendicular planes was so progressive at that date that it was a military secret for long time. Later this system was expanded to the projection on three to six planes. Usually 1st angle method or 3rd angle method for the position of other views relative to the principal view in the drawing are used. The reference arrows layout was permitted according to the ISO 5456-2:1996(E) in those cases when it is advantageous to position the views freely.

But in the ISO 128-30:2001(E) the method of using reference arrows has been selected as the preferred one. Why so? What advantages it gives for us?

Is it more effortless to interpret a drawing? No! Because we lost possibility to see views positioned **relatively** to each other. And if usually used first angle method sometimes is called as shadow method and third angle method – as mirror method so what shadow or mirrored view of the object according to the method of using reference arrows we will have (Fig.1)...



Fig.1. Shadow and mirrored view of the object (<http://www.worth1000.com/>)

Another question: Is it any problem to present views in the first angle projection or third angle projection method when we use graphic software? The answer is no. Otherwise – to position views in the method of using reference arrows is less handy.

So when the method of using reference arrows can be useful? I see two main situations for this method using. The first case is when we want to arrange views more compactly. For example: We want to draw the front view, the view from the left and the view from the rear on a format A4 drawing sheet (Fig.2).

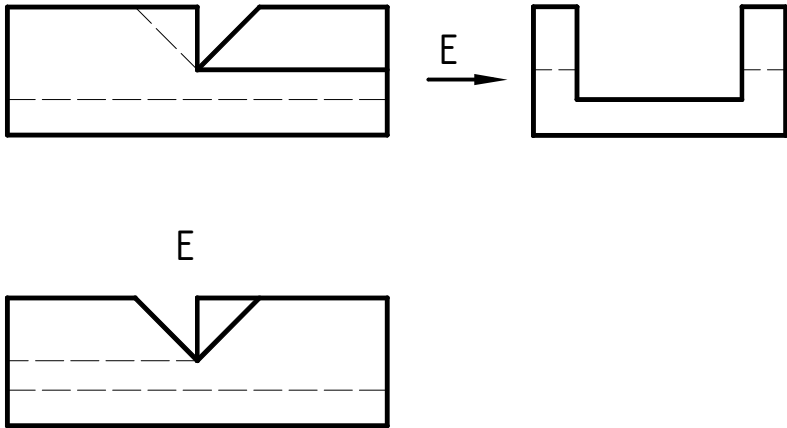


Fig.2. Applying of the method of using reference arrows for more compact views arrangement

Another situation is when we usually draw sketch manually and finds out that we made mistakes in views arrangement the method of using reference arrows can be useful to avoid redrawing.

I think we must use the first angle projection method as the preferred one for students teaching as we do it at the descriptive geometry course. Furthermore, the first angle projection method matches up our visual perception skills the best as I had told at the conference Ustron 2008 (Viewing of graphical information. http://ogigi.polsl.pl/zeszyt_Ustron_08/zu08_24.pdf).