Aspect Ratio is easy! (Keep repeating that over and over and over)
Aspect Ratio is very useful, especially for chain makers.

Aspect Ratio (AR) is how the diameter of wire in millimeters relates to the internal diameter of the ring. (Clear as mud right?)

AR= internal diameter/ diameter (mm)

Simple!

How do we use it?

If I am making a Byzantine chain and the AR is 3.5 then I know I can figure out what the internal diameter is for any wire gauge size I want to use. This allows me the flexibility to change wire gauges and make heavier or more delicate chains.

so to make a Byzantine in various gauges…

3.5=x/y where x is the internal diameter of the ring and y is the diameter of the wire (looking like algebra, eh?) or

3.5 = ID/diameter

Rearrange the equation

AR*y=(x/y)*y (to cancel the y from the right side of the equation)
AR*y =x (and substitute 3.5 which is the aspect ratio for the Byzantine)
3.5*y=x

or

AR(Diameter)= (ID/Diameter) Diameter
AR(Diameter)= ID

| Ga Diameter | | ID (mm) |
|---|---|---|
| 16 (1.3mm) | 3.5*1.3= | 4.55 |
| 18 (1.0 mm) | 3.5*1.0= | 3.5 |
| 20 (0.8 mm) | 3.5*0.8= | 2.8 |
| 22 (0.65 mm) | 3.5*0.65= | 2.275 |

Now you have the internal diameters but what if the rings don't come in 2.275mm ID? Round up to the next ring size. Especially for a tight weave like the Byzantine, if you round down your weave may be too tight. For a weave that is looser, like a 3 in 3 or European 4 in 1, you could round down to 2.0 mm ID in 22 gauge. Having said that, 4.55 mm ID for 16 ga wire is close enough to 4.5mm that it will work splendidly for the Byzantine.

It is important to keep in mind what diameter your wire is. For someone living in Europe the gauges will not match the internal diameters I have listed above. I think in Europe 16 gauge wire is 1mm in diameter. So if you are reading instructions for making a weave make sure you check out the diameter of the wire rather than just reading what gauge it is.

So what if the directions call for 1.3 mm wire with an ID of 5 mm and you have 1mm wire? What ID do you need?

AR=ID/diameter

so …

AR=5/1.3

AR= 3.846 (or about 4)

So now that you know the AR you can figure out the ID needed for 1.0mm diameter wire (18 gauge in the AWS, B&S system)

AR(diameter) =ID
3.846(1.0) = ID
3.846 = ID
(Conversions are easy with 1.0 mm wire!)

And if rings aren't available in 3.846mm or 3.8 mm ID round up to 4.0.

If you have any questions let me know.

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