

Buying Jump Rings for a Project: Avoid The Pitfalls

If you are a relatively new to making jewelry with chain mail, you've probably used a kit or taken a class with an instructor who has either supplied the rings or pointed to the ones to purchase.

Now you want to:

1. Buy rings in a different gauge to make another bracelet so the new one is either more delicate or heavier than the one you just finished; or
2. Buy different rings to re-make the same piece; or
3. Make a totally different project, but you only know the Aspect Ratio, not the ring sizes.

To solve any of these problems, you need to know TWO pieces of information.

Problem 1

Let's say you made a sterling silver Byzantine bracelet and you used **18 gauge (AWG), 3.5 mm ID** jump rings. However, now you want to make a heavier weight of chain using 16 gauge rings.

What do you know?

- The wire gauge was 18 AWG
- The ID of the rings was 3.5 mm.

Step 1: Find the Aspect Ratio for This Weave

Before you can do any calculations you need to know the thickness of the wire and the ID of the rings both in the same measurement system. So, you look up 18 gauge in the AWG charts and see that **18 gauge = 1.024 mm** (see links to charts below).

The first calculation finds the Aspect Ratio of a ring size that you know works well for the Byzantine weave.

$$\text{AR} = \text{ID} \div \text{WD}$$

$$\text{AR} = 3.5 \div 1.024$$

$$\text{AR} = 3.42$$

Step 2: Find a Heavier Ring Size

You know the Aspect Ratio. You look up 16 gauge wire and see that **16 gauge = 1.291 mm** in diameter.

To find the ID for a 16 gauge jump ring, cross multiply:

$$\text{ID} = \text{AR} \times \text{WD}$$

$$\text{ID} = 3.42 \times 1.291$$

$$\text{ID} = 4.42 \text{ mm}$$

This result tells you that a 4.5 mm ID) should work. (In fact, that's exactly the ring size I have used .

Step 3: Find a Lighter Ring Size

The next task is to find out what ring size to use for a delicate, 20 gauge Byzantine chain. You know the Aspect Ratio. You find out from a chart that **20 gauge = .8128 mm** thick.

$$\text{ID} = \text{AR} \times \text{WD}$$

$$\text{ID} = 3.42 \times .8128$$

$$\text{ID} = 2.78 \text{ mm}$$

This tells you to try 20 gauge, 2.75 ID jump rings. (Yes, I've tried it, and it makes a lovely chain!)

Problem 2

Let's say you made a Byzantine bracelet with bright aluminum rings, and you used 18 gauge rings with an inside diameter of $5/32$ ". Now you want to make a similar one in sterling silver as a gift for your mother.

Why is This a Problem?

You used 18 gauge aluminum rings. Base metal rings, such as aluminum, are frequently made using the SWG system—BUT precious metal rings are usually made using the AWG system.

Step 1: Find the Wire Diameter WD: SWG to AWG

The wire gauge is a measure of the thickness of the wire (the wire diameter or WD). The bigger the number, the thinner the wire. There are two common gauge systems: American Wire Gauge (AWG) (sometimes called B&S for Browne & Sharpe) and British Standard Wire Gauge (SWG). 18 gauge SWG is heavier than 18 gauge AWG.

Because you want to use sterling silver rings, you need to find a similar WD in the AWG system

Fortunately there are charts (see the resource links below) that will help you switch between these two systems. When you look at the charts, the 18 gauge (SWG) wire you used has a **WD = 1.22 mm**.

Because you want a similar size of wire, you choose 16 gauge (AWG) which has a **WD = 1.29 mm**.

Step 2: Convert the Jump Ring Size ID: inches to MM

The inside diameter (or ID) in our question is $5/32$ ". Typically, jump rings using SWG gauges are measured in fractions of an inch. But, AWG rings typically use metric measurements.

I could change the $5/32$ in. to a decimal fraction, then figure out how to convert it from Imperial to Metric—but there's a better way. There are charts for that! See the link below.

I used a chart to change the fractions of an inch to millimeters. **ID = $5/32$ in. = 3.97 mm**

Step 3: Calculate the Aspect Ratio AR

To find the AR, you only need to know the wire diameter and the inside diameter of the rings that you used, and then divide those numbers on a calculator..

1. You know that the **ID is 3.97 mm** because we used a chart.
2. You know that you used 18 SWG rings and that we used a chart to find out that **the WD is 1.22 mm.**
3. Take out your calculator and divide ID / WD or **3.97 mm divided by 1.22 mm.** My calculator says **3.3 mm** (rounded). This magic number is called the **Aspect Ratio** or AR

Step 4: Look in a Chart to Find the Jump Ring Size ID

Go to the chart for 16 AWG jump rings. Scan down the column that gives the AR to find the one closest to 3.3.

Bingo! A 16 AWG jump ring with an ID of 4.25 mm has an AR of 3.3. Notice also that a 4.5 mm jump ring has an AR of 3.5. Either of these sizes of jump rings will work well for your sterling silver Byzantine Bracelet.

Problem 3

I want to find a tutorial for a new project (Barrel Weave) and buy the rings in bright aluminum.

The Tutorial

I've searched around, and I see a pattern for the Barrel Weave:

<http://www.mailleartisans.org/weaves/weavedisplay.php?key=600>

The tutorial gives the AR but not the ring size or gauge. I do know I need SWG for aluminum rings. (Clue: The tutorial does say that the size for Barrel is the same as for Byzantine.)

The Easy Math

The tutorial tells me that the **AR=3.5**

Now you need to decide how delicate/heavy you want the rings to be. You decide on 18 SWG, just like that first Byzantine Bracelet you made. Looking in the charts you see that gauge measures **WD=1.22 mm**. You now have your two pieces of information.

AR = ID/WD

So therefore,

ID = AR x WD

ID = 3.5 x 1.22 = 4.27 mm

The final task is to find out what this means in inches.

I look at the chart: <https://mdmetric.com/tech/cvtchtfdm.htm>

and scan down the mm column looking for 4.27

Aha! I see that the closest sizes are 5/32 and 11/64.

A Source for the Aluminum Rings

I wonder if they sell rings that size? I check on a popular website <http://www.metaldesignz.com/bright-aluminum-jump-rings-18-gauge-5-32-id/> and find that the closest ring size in 18 gauge SWG with an AR=3.5 is 5/32—and the notes say that this is the size for Byzantine. Perfect!

Resources: Where to Find the Charts

The book *Chain Maille Jewelry Workshop* by Karen Karon has all of these charts at the back of her excellent book. I keep it handy for reference.

Here are some internet links:

ID: Chart for fractions of an inch to millimeters:

<https://mdmetric.com/tech/cvtchtfdm.htm>

WD: Chart for wire gauge conversions

http://www.pkjewelry4u.com/chainmaille_057.htm

Jump ring gauge converter tool:

http://chainweavers.com/index.php?main_page=page&id=43&chapter=10