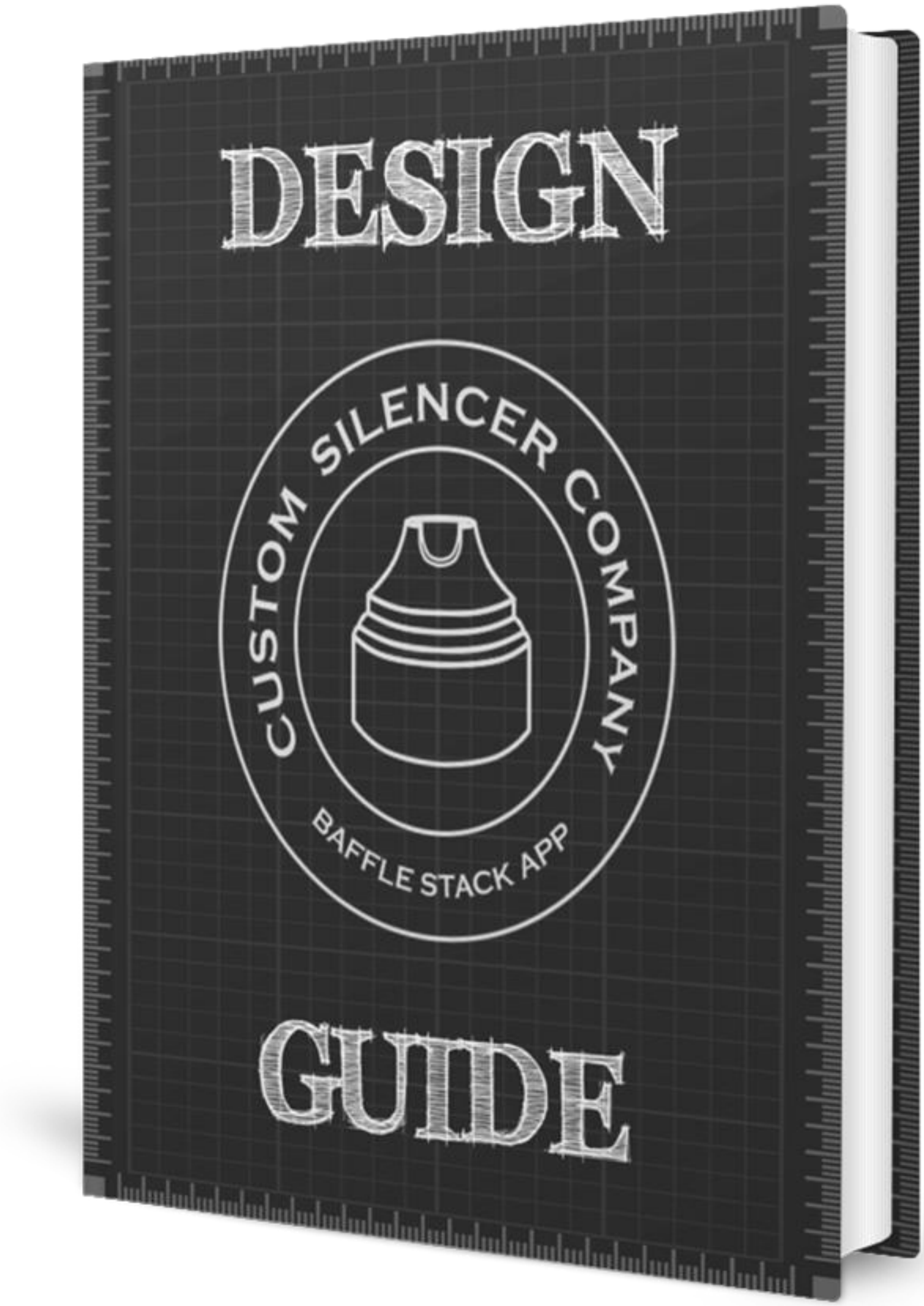

DESIGN
CUSTOM SILENCER COMPANY
BAFFLE STACK APP
GUIDE

Contents

Disclaimer

Everything provided in this writing is considered general guidelines, and individual suppressor designs may require slight adjustments based on the specific goals of the suppressor (sound reduction, gas pressure management, etc.) and the firearm it's designed for. The resources section may be beneficial in seeking any additional information.

Workbook

As you go through this document, you can input the workbook values. Sections related to the workbook will be highlighted in red text. By completing all the workbook sections, you'll gather all the values necessary for the initial design of your custom silencer. These values can be entered into the workbook worksheet located in the reference section of the document.

For those new to suppressor construction, we suggest completing the workbook as it serves as a valuable tool for learning and gaining a clearer understanding of the process.

Main silencer sections

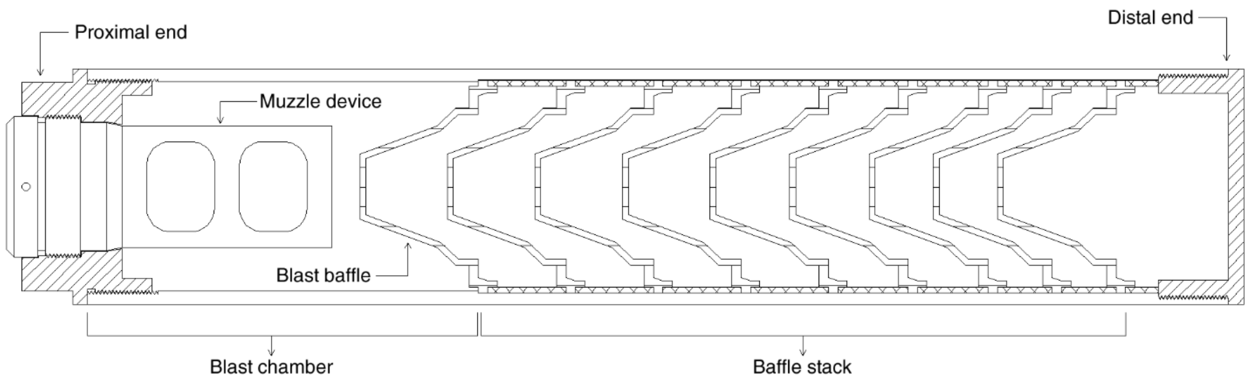
Silencers, or suppressors, reduce firearm noise by slowing and cooling the escaping gases produced when a shot is fired. Normally, these gases exit the barrel at high pressure and speed, creating the loud "bang" associated with gunfire. A silencer contains a series of internal baffles and chambers that trap and gradually release these gases, lowering their pressure and velocity. This process not only reduces the sound but can also minimize the muzzle flash. While a silencer doesn't make a gunshot completely silent, it significantly suppresses the noise, often to a level that won't damage hearing or draw as much attention.

Silencers are relatively simple devices, consisting of four primary sections:

1) The main body
2) A proximal end and distal end. In anatomical terms, "proximal" and "distal" are used to describe the location of structures relative to other parts of the body:
    a) Proximal: This term refers to being "closer to the point of attachment or origin." In the context of suppressors, it describes the mount, such as a direct thread or quick detach (QD) system.

b) Distal: This term refers to being "farther from the point of attachment or origin." In suppressor terminology, it pertains to the distal chamber and the end cap.

3) Blast chamber
4) Baffle stack



Disclaimer: This image is for reference purposes only. It is not to scale, not dimensionally accurate, and should not be used for machining or manufacturing.

Let's discuss each section in greater detail.

Main body

Silencers are built with a main body that is either a simple tube for holding baffles or a welded assembly where the baffles themselves create the tube. The main body can be constructed from various materials, though it is most commonly made from either titanium tubing or 17-4 stainless steel tubing. Titanium offers a combination of strength and lightweight properties, whereas 17-4 stainless steel tubing is even stronger but comes at nearly twice the weight.

Proximal end and mount

This is the end that connects to the firearm's barrel, typically using an attachment mounting system such as a direct thread mount or a quick detach (QD) device. Mounting options are also available for barrels that do not have threading.

Blast Chamber

The blast chamber is a critical component of a silencer, located immediately after the mounting point where the suppressor attaches to the firearm's barrel. This initial chamber is specifically designed to manage and contain the high-pressure gases expelled from the muzzle when a shot is fired.

The dimensions and design of the blast chamber play a pivotal role in the silencers performance, impacting key aspects such as sound suppression, back pressure, and the overall acoustic "tone" of the shot.

Blast Baffle

The blast baffle is the first baffle in a silencer's baffle stack, positioned directly after the blast chamber. It plays a crucial role in managing the intense, high-pressure gases and debris expelled from the firearm's muzzle when a shot is fired. This baffle endures the most stress and heat, making its material selection critical for durability and performance.

Titanium Blast Baffle: Titanium is valued for its lightweight properties and corrosion resistance. While it can handle moderate heat and pressure, it is less durable under extreme conditions compared to other materials. Titanium blast baffles are ideal for applications where weight reduction is a priority, such as in hunting or lightweight firearm setups. However, they may not be the best choice for high-volume or rapid-fire scenarios due to their lower heat tolerance. The Baffle Stack APP has titanium baffles.

17-4 Stainless Steel Blast Baffle: 17-4 stainless steel is a popular choice for its excellent strength, heat resistance, and corrosion resistance. It is heavier than titanium but offers superior durability, making it suitable for suppressors used in high-pressure and high-volume shooting. This material strikes a good balance between performance and cost, making it a versatile option for many firearm applications. The Baffle Stack APP has 17-4 H900 baffles.

Inconel Blast Baffle: Inconel, a nickel-based superalloy, is renowned for its exceptional heat resistance and strength under extreme conditions. It is often used in suppressors designed for full-auto or high-rate-of-fire firearms, where the blast baffle must withstand prolonged exposure to intense heat and pressure. While Inconel is heavier and more expensive than titanium or 17-4 stainless steel, its durability makes it the top choice for suppressors subjected to the harshest conditions. The Baffle Stack APP DOES NOT have Inconel baffles at this time.

Importance of the Blast Baffle: The blast baffle is critical because it absorbs the brunt of the high-pressure gases and particulate matter from the muzzle blast. This protects the subsequent baffles in the stack from excessive wear and damage, extending the overall lifespan of the suppressor. Additionally, the blast baffle contributes to sound suppression by disrupting and slowing the gases before they pass through the rest of the baffle stack. Choosing the right material for the blast baffle ensures the suppressor can handle the specific demands of its intended use, balancing durability, weight, and cost.

Baffle Stack

The baffle stack is the heart of a silencer, playing a pivotal role in reducing the sound signature of a firearm. It consists of a series of precision-engineered baffles that work together to slow, redirect, and cool the expanding gases produced when a round is fired. These baffles are typically aligned in a stack, separated by spaces or spacers within the silencer's tubular body.

Silencer builders often tailor the baffle stack's design and configuration to optimize performance for specific calibers, barrel lengths, and use cases. Advanced designs may incorporate asymmetric cuts or venting to fine-tune gas flow and enhance performance.

Distal chamber and end cap

Distal Chamber: The distal chamber is the final section of the silencer where the gases, after passing through the baffle stack, continue to expand and slow down. This chamber helps further reduce the pressure and velocity of the gases before they exit the suppressor, contributing to additional sound suppression. In some designs, the distal chamber may include features like vents or specialized geometry to enhance gas cooling and dispersion. It also acts as a secondary stage of containment, ensuring that the suppressed sound remains consistent and effective.

End Cap: The end cap is the outermost component of the silencer, sealing off the suppressor's distal end while providing an exit point for the bullet. Its primary role is to guide the projectile as it exits the suppressor, ensuring that it remains stable and on trajectory. The opening of the end cap is usually caliber-specific, with a slightly larger diameter than the projectile to accommodate safe passage while minimizing the escape of gases. Some end caps are designed with additional features, such as flash reduction elements, to further enhance performance.

Silencer design criteria

The first rule of silencer building: Just build it! Many enthusiastic builders dive headfirst into the process, only to feel overwhelmed by the sheer volume of information and endless design options. It’s easy to overthink and second-guess every decision but remember—this isn’t rocket science. Take a deep breath, relax, and enjoy the process. Half the fun lies in designing your custom silencer, not just firing it once it’s complete.

The easiest approach to building a custom silencer is to start by selecting the primary host firearm and caliber. Tailor the design to optimize performance for this specific setup. If it ends up being compatible with other firearms and calibers, treat that as a welcome bonus rather than the main objective.

Workbook:
What is the host firearm? Enter rifle or pistol in field 1
What is the caliber of the ammunition? Enter the caliber in field 2

While reducing decibel levels is the primary design goal, it's important not to become overly focused on achieving the absolute lowest readings. Designing a suppressor always involves trade-offs between overall length (OAL), weight and back pressure.

There's a point of diminishing returns—take, for example, a 12-inch suppressor packed with as many baffles as possible. It might offer marginally better sound reduction, but the added length and weight could outweigh the benefits.

Designing a silencer largely depends on individual needs. For a hunter using a bolt-action rifle, a longer suppressor might not pose any issues. In contrast, someone prioritizing a compact, ergonomic design for rapid-fire applications would require a shorter, more durable suppressor.

The hunter's suppressor is likely to be significantly quieter, with weight being a less critical factor. On the other hand, the shorter, sturdier suppressor will inherently be louder and heavier, catering to different functional demands.

Sound levels produced by any suppressor—whether custom-made or factory-produced—are influenced by factors such as temperature, weather conditions, and the type of ammunition used. Even on the same day at the same range, swapping one brand of ammunition for another can lead to noticeable differences in sound.

In fact, these variations can sometimes be more significant than the differences between slightly altered suppressor designs. If you reload your own ammunition, even a change in the type of powder used can have a substantial impact on the suppressor's performance.

Instead of making sound reduction the ONLY goal, prioritize building a suppressor that is tailored specifically to your host firearm and caliber. Focus on features that are crucial for your intended use—such as durability for heavy mag dumps, weight, or ease of attachment—and optimize your design around those needs. A suppressor crafted with your preferences and firearm setup in mind will provide the most rewarding and effective experience.

There are two approaches to starting your suppressor design. The first is to begin at the proximal end and progress toward the distal end, allowing the designed sections to dictate the overall length of the silencer tube. The second approach involves selecting a tube length first and then designing the silencer sections to fit within that predetermined length.

The latter method is the more commonly used approach and is the one utilized by the Baffle Stack APP.

Tube length

As you might expect, a longer tube generally results in a quieter suppressor—up to a point. This is because a longer tube offers greater internal volume and allows for more baffles in the stack.

Some individuals prefer the advantages of a longer suppressor, while others are willing to trade off a bit of sound reduction to enjoy the benefits of a shorter design.

Three factors play a key role in determining the tube length of your suppressor. First, the use of a muzzle device—if you're using one, the blast chamber will require more volume, resulting in a longer suppressor compared to a direct thread option. Second, the length of the blast chamber itself—a .22LR may need only a very short or minimal blast chamber, if any, while a magnum round might require a blast chamber as long as 4–5 inches. Lastly, the number of baffles and the spacing in the baffle stack will also influence the tube length. The more baffles in a stack, the quieter...and heavier the silencer will be.

Ultimately, whether to go with a long or short suppressor is a matter of personal preference. There's no universally right or wrong choice—it depends on your firearm, how you intend to use it, and which suppressor benefits you value most versus the trade-offs you're willing to make.

For example, with an SBR intended for close-quarters use, you might prioritize compactness and accept a slight increase in noise. Conversely, a longer suppressor would make sense for hunting scenarios, such as shooting from a ground blind, where maximum noise reduction is more critical. Striking the right balance is key.

Workbook:
The length of the tube is entirely a matter of personal preference. You can adjust the tube size at any time using the Baffle Stack APP. To get started, consider what tube size you would prefer for the muzzle end of the host firearm you've selected. Enter a numerical value between 6 and 9 in field 3, including half values such as 6.5 if desired.

Muzzle device

There are countless muzzle devices compatible with suppressors, including brakes, flash hiders, compensators, and boosters. If you're using a pistol with a floating or tilting barrel, a booster is absolutely essential. The only key requirement is that your blast chamber must be large enough to accommodate the muzzle device. If the device is too long, your only solution is to use an extension tube to increase the silencer's overall length.

Measuring your muzzle device is a straightforward task and an essential step. Taking the time to do it properly will definitely pay off. To measure the muzzle device or booster, start at the mounts inner flange and measure to the muzzle device or booster face. Keep this measurement for later.

The image below features two external boosters, one internal booster, and a muzzle device with its mount. It highlights the internal flange line as the starting point for measurements and the face as the endpoint.

Workbook:
If you plan to use a muzzle device or booster, input either "muzzle device" or "booster" in field 4. **If you are not using either, leave field 4 blank.** Then, enter the measurement of the muzzle device in field 5. **If you are not using either, leave field 5 blank.**

Blast chamber

Choosing the right blast chamber size for a silencer involves balancing several factors to ensure optimal performance for your firearm and ammunition. Here's a blast chamber guide:

1. Understand Your Firearm and Caliber

- **Rifle Calibers**: Larger blast chambers (e.g., 2.25–3 inches) are often used to handle the higher pressures and gas volumes generated by rifle rounds like 5.56 or .308.
- **Pistol Calibers**: Smaller blast chambers (e.g., .5–2 inches) suffice for lower-pressure cartridges like 9mm or .45 ACP.
- **Carbines and Subguns**: For pistol-caliber carbines, a middle range (1.5–2.25 inches) works well, as they produce higher pressures than pistols but less than rifles.

2. Consider Supersonic vs. Subsonic Ammunition

- **Supersonic**: Requires a slightly larger blast chamber to handle the greater gas volume and reduce stress on the first baffle.
- **Subsonic**: Can operate efficiently with a smaller blast chamber since gas pressure is lower.

3. Match to Your Firing System

- **Blowback Firearms**: Too large a blast chamber might reduce back pressure too much, affecting cycling reliability.
- **Gas-Operated Firearms**: Larger blast chambers can help manage back pressure and cycling more effectively.

4. Balance Suppression and Back Pressure

- A larger blast chamber allows gases to expand and cool, which can reduce back pressure but may decrease overall suppression efficiency.
- A smaller chamber may increase back pressure but could also improve sound suppression in certain designs.

5. Prioritize Suppressor Design Goals

- **Durability**: Ensure the chamber size and material can withstand repeated high-pressure use.
- **Compactness**: Smaller suppressors may require tighter chambers to maintain a manageable size and weight with a proper size baffle stack up.

A large blast chamber adds to the suppressor's length, adding weight and taking valuable space for additional baffles, but may not provide a proportional improvement in suppression. Additionally, a large blast chamber can increase first round pop (FRP). A larger blast chamber tends to have more oxygen available, which can amplify the FRP. Conversely, a smaller blast chamber reduces the amount of oxygen, potentially minimizing the effect. However, suppressor design involves trade-offs, as a smaller blast chamber might increase back pressure or affect overall suppression performance.

If a suppressor's blast chamber is too small, several issues can arise:

1. **Increased Back Pressure**: A smaller blast chamber can lead to higher back pressure, which may affect the firearm's cycling, especially in semi-automatic or automatic firearms. This could result in malfunctions or excessive wear on the firearm's components.
2. **Reduced Suppression Efficiency**: The blast chamber provides space for the high-pressure gases to expand and cool before reaching the baffles. If the chamber is too small, the gases may not have enough room to expand, reducing the suppressor's overall effectiveness.
3. **Accelerated Wear and Tear**: The first baffle in the suppressor, often called the blast baffle, is exposed to the highest pressure and temperature. A smaller blast chamber can concentrate these forces, leading to faster erosion or damage to the blast baffle

The optimal blast chamber size for a suppressor depends on whether you're using supersonic or subsonic ammunition, as the gas pressure and volume differ significantly between the two.

Supersonic Ammunition

Larger Blast Chamber: Supersonic rounds generate higher pressures and more gas volume due to their higher powder charge. A larger blast chamber (e.g., 2.25–3 inches for rifle calibers like .308 or 5.56) allows the gases to expand and cool before reaching the baffles, reducing wear and improving suppression.

Focus on Durability: The blast baffle in this case must handle intense heat and pressure, so the chamber size and materials should account for this.

Subsonic Ammunition

Smaller Blast Chamber: Subsonic rounds produce lower pressures and less gas volume, so a smaller blast chamber is sufficient. This helps maintain efficiency without adding unnecessary bulk1.

Optimized for Quietness: Subsonic ammo benefits more from baffle design and spacing, as the absence of a supersonic crack makes the suppressor's performance more noticeable.

Workbook:
Based on the host firearm you've selected and the information above, choose a blast chamber length that you believe fits your design. This value can be modified later if needed, so for now, pick a length between 0.5” and 4” and enter it in field 6.

Baffles

Baffles are designed to redirect and slow down the high-pressure gases exiting the muzzle. By creating turbulence, they allow the gases to cool and expand more gradually, reducing the sound signature.

Blast baffle

When selecting a blast baffle, two key factors should guide your decision: material and height.

Material Selection

Choosing the right material is critical to meeting the suppressor's application demands. The Baffle Stack APP offers three material options:

1. **Titanium**: Suitable for most applications due to its lightweight and durability.
2. **17-4 H900 Stainless Steel**: Ideal for scenarios involving high-velocity, supersonic ammunition, short-barrel rifles (SBRs), or frequent heavy use such as "mag dumps."
3. **Aluminum**: Best for low-pressure rounds. However, even in these cases, pairing a 17-4 H900 blast baffle with an aluminum stack is often a good idea for added durability.

Baffle height Considerations

The height of the blast baffle plays a vital role, particularly if you're using a muzzle device or booster. In such cases, a taller baffle may be preferred to achieve a specific "tip-to-tip" length. This length is the distance between the face of the muzzle device and the face of the blast baffle.

General Design Guidelines for Tip-to-Tip Offsets:

1. For muzzle devices with rifle calibers, an offset of 0.25 inches for subsonic rounds and up to 1 inch for supersonic rounds is recommended.

2. For boosters with pistol calibers, the offset can range from 0.01 inches to 0.5 inches, and occasionally slightly larger.

Determining Tip-to-Tip Offsets

This is simple enough, determine the approximate length from the face of the MD or booster to the blast baffle face.

Keep this measurement in mind as it will help when building the length of your blast chamber if you are using a muzzle device.

Calculating the blast chamber size to get a proper tip to tip value will be discussed later in this guide.

Workbook:
Considering the host firearm you've chosen, decide which material is most suitable for your silencer's blast baffle. Choose between titanium or 17-4 stainless steel and enter your selection in field 7. If you're utilizing a muzzle device or booster and have a particular tip-to-tip offset in mind, input that value in field 8.

Baffle geometry

Baffle designs are a critical factor in suppressor performance, as they directly influence how effectively the suppressor reduces sound and manages gas flow. The Baffle Stack APP offers conical and radial baffle designs.

Conical and radial baffles are two distinct designs used in silencers, each with unique characteristics that influence suppressor performance:

Conical Baffles

- **Shape**: These baffles are cone-shaped, with the apex of the cone pointing toward the muzzle. The design creates a streamlined path for gases to flow while redirecting them away from the bullet's trajectory.
- **Performance**: Conical baffles are highly effective at managing high-pressure gases, making them a popular choice for rifle suppressors. Their shape promotes turbulence, slowing and cooling the gases to reduce sound.
- **Durability**: Often used in high-pressure applications, conical baffles are typically made from durable materials like stainless steel or titanium to withstand intense heat and pressure.
- **Applications**: Commonly found in suppressors for supersonic rifle calibers, where managing large volumes of high-pressure gases is critical.

Radial Baffles

- **Shape**: These baffles have a radial or circular design, often featuring evenly spaced holes or slots around their circumference. The design allows gases to expand and escape radially.
- **Performance**: Radial baffles are optimized for low-pressure cartridges, such as pistol calibers. They provide effective sound suppression while maintaining a compact and lightweight design.
- **Durability**: Since they are used with lower-pressure rounds, radial baffles may be made from lighter materials like aluminum, though stainless steel or titanium can also be used for added durability.
- **Applications**: Commonly used in suppressors for pistol calibers or subsonic ammunition, where the focus is on compactness and efficiency.

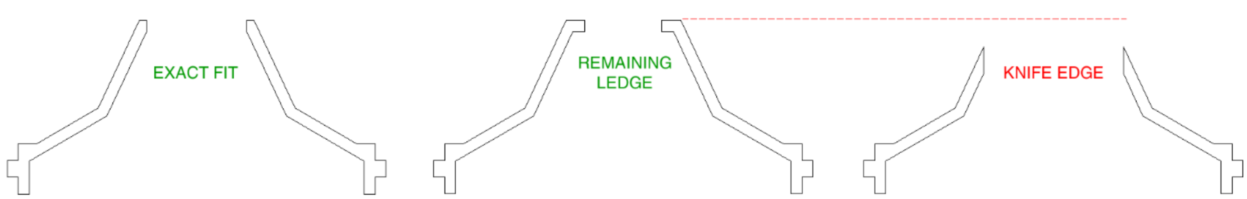
Both designs have their strengths and are chosen based on the suppressor's intended use, caliber, and performance goals.

Workbook:
Based on the host firearm and caliber you've chosen, determine which baffle geometry you believe will best suit your application. You can easily switch or combine types later if needed. Input either conical or radial in field 9.

Baffle bore

The bore of a baffle must, for obvious reasons, be at least the same size as the projectile passing through it. Ideally, the bore would match the projectile's size exactly, but in reality, to prevent baffle strikes, the bore needs to be slightly larger. A general guideline is to make the bore 0.060 inches (60 thou) larger than the largest projectile you anticipate using with the suppressor.

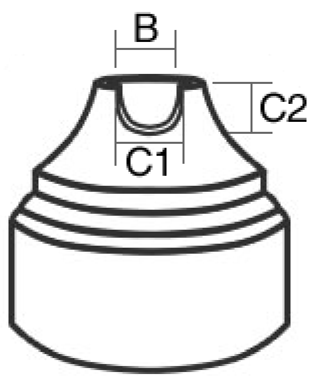
When determining the bore size, there are important trade-offs to consider. A bore that's too large reduces the effectiveness of suppression, while a bore that's too small increases the likelihood of baffle strikes. Additionally, the baffle's face size can influence the bore dimensions. For example, a large bore on a small-face baffle may create what's known as a "knife edge." This feature can accelerate baffle erosion, cause deformation, or even result in cracking over time. While such effects are uncommon during normal use, they remain a possibility and should be factored into your design particularly if you are an aggressive and frequent shooter. A larger bore than originally intended for the baffle will not only produce knife edge, it shortens the baffles overall height. It is not mandatory to avoid knife edge, rather something to approach with caution.



The following table displays what baffles will have knife edge with any given bore:

Baffle	Bore				
	Titan .275”	Chaos .360”	Shadow .400”	Demon .500”	Fury
Venom	Ledge	Exact	Knife	Knife	DIY
Madness	Ledge	Ledge	Ledge	Exact	DIY
Alpha	Ledge	Exact	Knife	Knife	DIY
Beta	Ledge	Exact	Knife	Knife	DIY
Sigma	Ledge	Exact	Knife	Knife	DIY
Gamma	Ledge	Exact	Knife	Knife	DIY
Omega	Ledge	Exact	Knife	Knife	DIY
Ultra series	Ledge	Ledge	Ledge	Exact	DIY
Reaper series	Ledge	Exact	Knife	Knife	DIY
Agent	Ledge	Ledge	Ledge	Exact	DIY
Mini agent	Ledge	Exact	Knife	Knife	DIY
Orbis	Ledge	Exact	Knife	Knife	DIY

The Baffle Stack APP offers 5 bore options:



Option	B	C1	C2
Titan	.275”	.138”	.165”
Chaos	.360”	.188”	.200”
Shadow	.400”	.200”	.200”
Demon	.500”	.250”	.250”
Fury	DIY	DIY	DIY

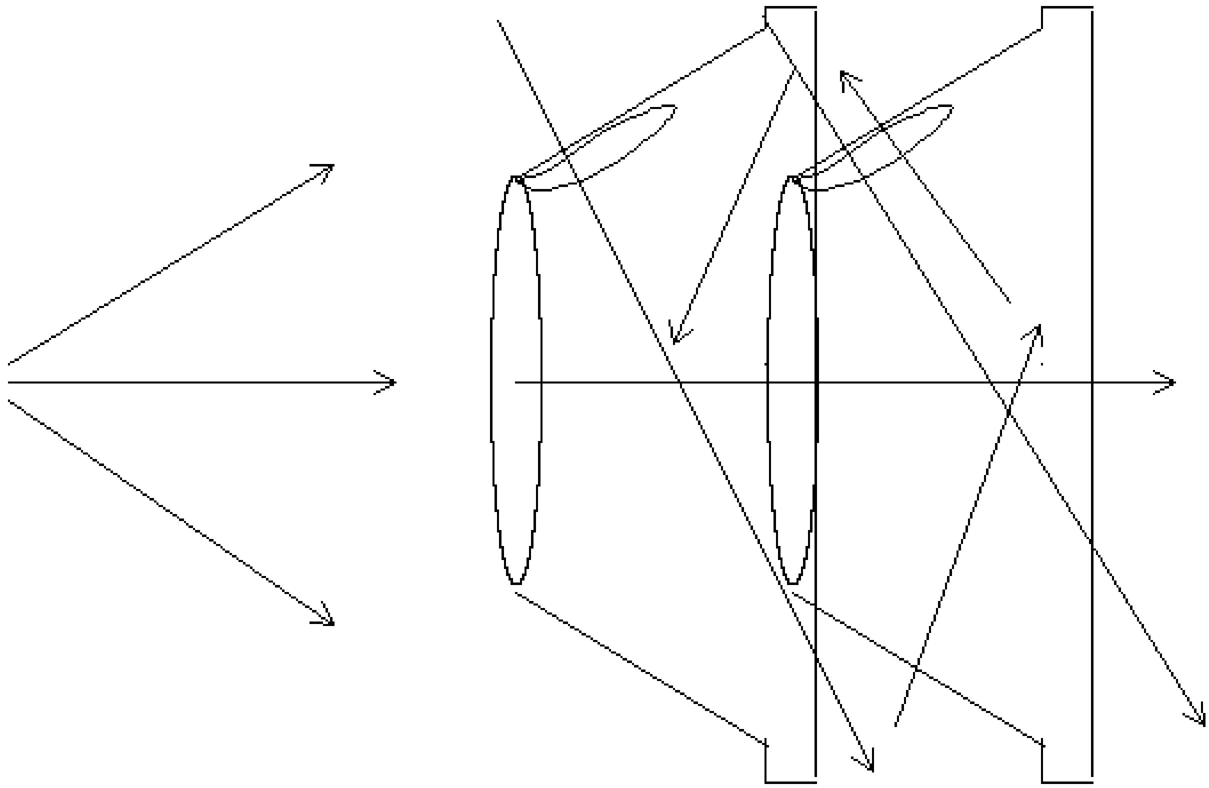
Workbook:
Considering the caliber you've chosen and the requirement for the bore size to be 60 thousandths of an inch larger than the largest projectile you plan to fire, decide which bore size suits your needs. Input titan, chaos, shadow, demon, or fury in field 10.

Baffle clipping

Follow your ABC's…. Always be clipping! Its pretty much mandatory!

Silencer baffle clipping involves modifying the edges of baffles by cutting or shaping them to create asymmetrical openings. This process disrupts the flow of high-pressure gases as they pass through the suppressor, forcing the gases to interact more with the baffle chambers rather than escaping directly through the bore.

The illustration below depicts the flow of gas as it passes through the baffles. Rather than traveling directly down the central bore, the clips redirect the gas into the chambers between the baffles, creating turbulence and reducing its speed.

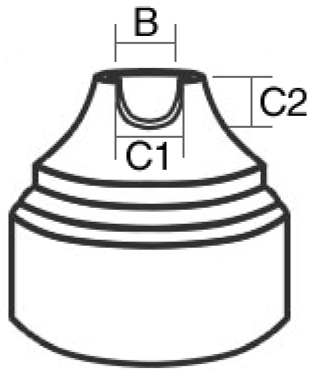


Incorporating clipping is particularly beneficial for high-pressure or high-velocity rounds, where managing gas flow is critical. However, the specific clipping method and depth should align with your suppressor's design and intended use.

Unless you select the "Fury" Bore and Clip option, the bore size you choose will determine the clipping configuration for any silencer produced using the Baffle Stack APP. If you select the Fury clip, these are general guidelines for clipping:

Width (C1 listed in diagram below) = bore size x .5
Depth (C2 listed in diagram below) = 1.2 x width

The clip width and depth based on selected bore size when using the Baffle Stack APP is demonstrated in the table below.



Option	B	C1	C2
Titan	.275"	.138"	.165"
Chaos	.360"	.188"	.200"
Shadow	.400"	.200"	.200"
Demon	.500"	.250"	.250"
Fury	DIY	DIY	DIY

Baffle spacing

1. Static Spacing vs. Progressive Spacing

Baffle spacing refers to the distance between each of the baffles inside a suppressor. The type of spacing you use—static or progressive—can significantly impact the silencer's sound reduction, as well as how it interacts with the gun's gas dynamics.

Static Spacing

Static spacing means that the distance between the baffles is uniform across the entire length of the suppressor. This design is relatively simple and often used for suppressors that are intended to be general-purpose. Static spacing can provide consistent suppression characteristics, but it might not be as efficient in managing the pressures and gases, especially for supersonic ammunition but may work better for subsonic ammunition.

Progressive Spacing

Progressive spacing refers to varying the distance between the baffles as you move along the length of the suppressor. Typically, the spacing starts wider at the proximal end of the suppressor and gradually becomes narrower towards the distal end of the suppressor. This design is often used to better manage the high-pressure gases and to optimize sound suppression, particularly for supersonic ammunition.

2. Baffle Spacing for Supersonic vs. Subsonic Ammunition

The type of ammunition you use (supersonic or subsonic) significantly affects how you should design the baffle spacing in a suppressor.

Supersonic Ammunition

With supersonic ammunition, the bullet is traveling faster than the speed of sound (1,125 feet per second at sea level), and this results in the creation of a shockwave. This shockwave causes the loud crack you hear when the bullet is fired. Suppressing supersonic ammo requires managing the high-pressure gases produced when the bullet is fired and efficiently decelerating the shockwave.

- **Baffle Spacing Considerations**:
    - Progressive spacing tends to work best for supersonic ammunition because it allows for a more controlled expansion and cooling of gases.
    - The wider spacing at the front allows the gases to expand quickly before they encounter more restrictive baffles towards the rear.

Subsonic Ammunition

Subsonic ammunition is designed to travel slower than the speed of sound, avoiding the supersonic crack. While the lack of the shockwave makes subsonic ammunition quieter in terms of muzzle noise, there are still high-pressure gases to manage. The suppressor's goal is to reduce these pressures and sound, as well as to ensure smooth cycling of the weapon (if it's a semi-automatic or automatic firearm).

- **Baffle Spacing Considerations**:
    - For subsonic ammunition, baffle spacing may be slightly closer together, as there is less need to manage the shockwave but more focus on slowing down the gases and reducing their pressure.
    - A more uniform or static spacing design could be more effective for subsonic ammo as there is less emphasis on decelerating a shockwave, but more on efficiently reducing the pressure of the expanding gases.

3. Impact of Baffle Spacing on Back Pressure

Back pressure refers to the amount of force exerted back into the firearm's action by the gases traveling through the suppressor. High back pressure can interfere with the cycling of semi-automatic or automatic firearms, potentially causing malfunctions like failure to eject, failure to cycle, or excessive fouling in the firearm's chamber and action.

- **Baffle Spacing and Back Pressure**:
    - Tighter baffle spacing increases back pressure because it creates more resistance for the gases as they travel through the suppressor. This can push more gas into the firearm's action, leading to higher back pressure.
    - If the baffles are too close together, especially in a suppressor designed for supersonic ammunition, the gas has less room to expand and slow down, leading to higher pressures and back pressure.
    - On the other hand, progressive spacing allows for better dissipation of gases, potentially reducing back pressure by allowing the gases to expand and cool progressively. This can be particularly beneficial for semi-automatic firearms that need to cycle properly without causing excessive force to be sent back into action.

For supersonic ammunition, a minimum of 0.5 inches between baffles at the proximal end is recommended to ensure adequate gas expansion and shockwave management. Supersonic ammunition prefers more volume or fewer baffles with larger spacing between baffles.

For subsonic ammunition, a tighter minimum spacing of 0.25 inches to 0.375 is often sufficient. Subsonic rounds benefit from more baffles and smaller volume. This can be achieved by placing more baffles with a smaller spacer.

Workbook:
Based on the host firearm and caliber you have chosen and the information above, do you think static spacing or progressive spacing would be better for your needs? Enter static or progressive in field 11.

OAL (Over All Length)

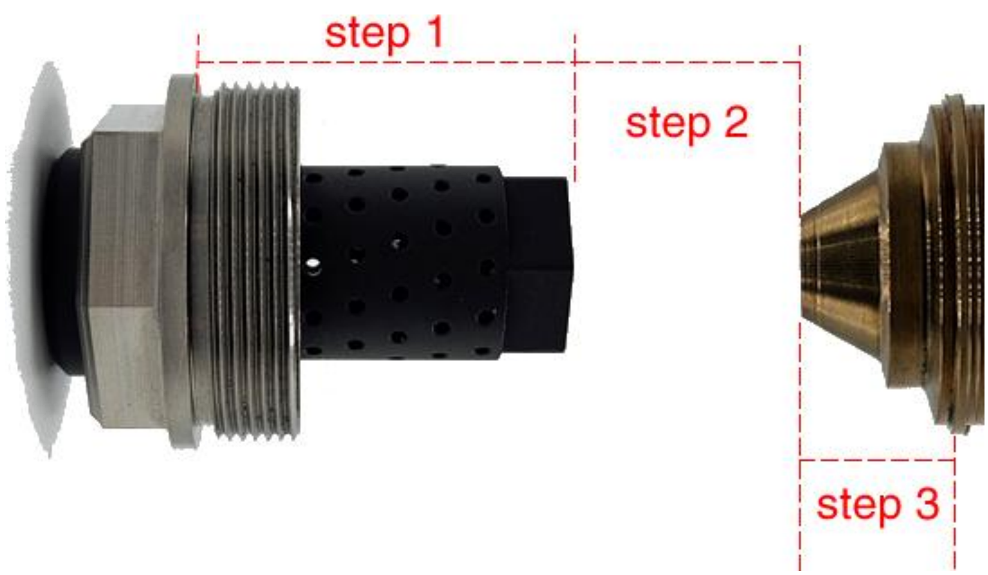
Calculating the overall length (OAL) of a suppressor is straightforward. Simply add the length of the silencer mount, the body, and the end cap. The sum of these components gives you the suppressor's OAL.

Building a blast chamber around a specific muzzle device

Building the proper size blast chamber around a specific muzzle device is easy, especially if you completed the math in sections "muzzle device" and "blast baffle". Determining the blast chamber size for any specific muzzle device with a particular tip to tip offset involves these 4 steps:

1. Determine how far into the tube the muzzle device will protrude in the blast chamber. Follow the measurement guidelines in section "muzzle device"
2. Determine what the offset from the muzzle device face to the blast baffle face will be. See section "blast baffle".
3. Determine what the baffles height from the stack flange is. These values are in the reference section of this guide.
4. Calculate the chamber size: step 1 + step 2 + step 3 = BC length

The illustration below details this. When using the Baffle Stack APP select a tube chamber size that will closely match your calculations.



Workbook:
If you're designing a blast chamber around a muzzle device and the tip-to-tip offset detailed earlier in this document, follow the outlined mathematical steps and input the resulting value into field 12. **If you are not using a muzzle device, leave this field blank.**

SBR warning

Warning: Suppressor Use on Short-Barreled Rifles (SBRs)

When attaching a suppressor to an SBR, it's crucial to consider the following:

- **Increased Gas Pressure:** Short barrels result in higher gas pressures, which can strain your suppressor and firearm or result in **failure**! Ensure that the suppressor is designed with durable materials for use with high-pressure setups like SBRs.
- **Erosion and Wear:** The elevated pressure and heat can accelerate wear on both the suppressor and barrel crown. Regular maintenance is essential to avoid damage.
- **Functionality Issues:** The combination of an SBR and suppressor can alter cycling dynamics, leading to malfunctions. Adjustments to the firearm's gas system may be necessary.

Further resources

Form 1 boards: www.form1.org

r/Form1: https://www.reddit.com/r/Form1/

Facebook group: Form 1 builders support

Reference

INSERT BAFFLE HEIGHT SIZE TABLE HERE

Workbook worksheet

Print the work sheet out and fill in the fields. When you have completed all the fields, transfer the values to the form located on the Custom Silencer Company website design guide page located at **https://customsilencercompany.com/DesignGuide.php**

Field 1 (Host firearm):____

Field 2 (Caliber):____

Field 3 (Tube length):____

Field 4 (MD or booster):____

Field 5 (MD length):____

Field 6 (BC length):____

Field 7 (BB material):____

Field 8 (BB offset from MD):____

Field 9 (Baffle geometry):____

Field 10 (Baffle bore):____

Field 11 (Baffle spacing):____

Field 12 (BC updated):____