

Earmolds & More

Welcome!

To navigate this Earmold Catalog, simply click on any page number below and you will go directly to it.

To return to this Table of Contents, press your HOME key.

The Page Up and Page Down keys allow you to browse.

To switch to the Supply Catalog, click [here](#).



Contents

Welcome to Westone	2
Ordering, Delivery, and Other Important Things	4
The Ear and the Earmold According to Westone	5
About Impressions	6
Earmold Materials and Colors	10
Tips and Guidelines for Earmold Material Selection	12
Venting, Sound-Bore Modifications and Acoustics	13
Hearing Instrument Earmolds	16
Retubing Guidelines	20
Communications and Occupational Earmolds	22
Hearing Protection and Recreational Earmolds	24
Products for the Musician	26

Welcome to Westone!



It doesn't seem like it's been nearly half a century since Ron and Mickey Morgan made their first earmold on a kitchen table in a little cabin in the Colorado mountains. A lot of things have changed since then.

In addition to using traditional techniques pioneered by Westone, we now use lasers and computers to scan impressions, model earmolds and manufacture finished custom earpieces. Westone supplies the front-line peacekeepers in our armed services with ear-level communications and hearing protection for the most advanced aircraft and equipment. Our earpieces have been the first choice for the Ansari Prize-winning Space Ship One civilian flights into space. And Westone's products for musicians are used the world over to help them to hear more clearly and precisely on stage, as well as to protect the hearing of fans attending those concerts.

We've made millions of earmolds since our humble beginnings, and instead of a kitchen table, we now occupy over 75,000 square feet of facilities in three states. Although some things have changed, the truly important things have not. We remain completely committed to the cause of helping the world hear better, one person at a time.

Our earmold catalog is packed full of custom-fit, oto-plastic products for both hearing protection and hearing amplification. These custom-made earpieces afford you, the hearing healthcare professional, a wide variety of options to successfully fit your patients.

Almost fifty years ago, Ron and Mickey Morgan decided that the "Golden Rule" was the only way to conduct business. Today we still believe that is true. We will always believe in the absolute satisfaction of our customers, whatever it takes. Each day we strive to provide the best products we possibly can, while offering them at a fair price. We're here to be of service, and we'll do our very best to answer questions, provide professional guidance and offer sound advice ~ whether you're a customer or not.

That's the way it's always been. And that's the way it will stay.

A handwritten signature in black ink, appearing to be 'R.M.' or similar initials.

Randy Morgan, R.G.
President & CEO

Where We Are

Westone's headquarters are located in beautiful Colorado Springs, Colorado. This is where you'll find the majority of our manufacturing facilities, our research and development team, our technical service representatives, and all warehousing, shipping and administrative functions.

Kalamazoo, Michigan, is the site of our eastern laboratory. In a building designed specifically for the manufacture of custom oto-plastics, we can speed delivery to our mid-western and eastern customers.

We've served the west coast for over 20 years now from our laboratory in Seattle, Washington. Within our newly expanded facility, you'll find the same commitment to absolute quality that defines all of our laboratories.

What We Do

Westone is known throughout the world for providing quality products and services that improve and protect the hearing experience, contribute to the effectiveness of hearing healthcare professionals and support innovation in the hearing healthcare industry.

Our precise, custom-fit earmolds provide comfortable and highly-effective sound transmission to the ear for a multitude of applications. Our wide variety of custom-fit hearing protection products protect people in work, recreation and entertainment environments from an increasingly noisy world.

We are also a valuable resource for professional counsel, ideas and assistance. Our team includes technical specialists and professional audiologists.

Who We Are

Even with thousands of products on hand, Westone's most important asset remains our people. When you call us, you can be assured that a friendly, helpful person will answer the phone. You can count on quick and accurate answers to your questions, as well as immediate attention to your orders.

The skills of our people—many of whom have been with us for decades—will serve you well if you have a technical concern, a special request or a unique problem.

Our high regard for the Westone family includes you, our customer. We are here to help you in any way we can. All of us in the hearing healthcare industry share common goals and bonds.

Just let us know how we can be of service.

Where We're Going

Westone has evolved from, literally, a Mom and Pop operation to a global enterprise. In recent years, we have formed strategic business alliances with firms in Europe, North, South and Central America, as well as Australia, New Zealand, Russia, Asia and Africa to bring advanced hearing healthcare products and services to many people who previously had limited access to these technologies.

With our diverse team of dedicated and talented employees, we are also exploring exciting new fields in other areas of healthcare and beyond.



ACCES® in Space

In 1999, Westone was approached by The Air Force Research Laboratory to see if we could combine custom-fit hearing protection with in-ear communications products to help ground and aircrew personnel in the very high noise fields generated by modern military aircraft.

The result of this collaborative effort was ACCES (Attenuating Custom Communications Ear-piece System). First used by the F22 Raptor aircrew, ACCES was also the communication system of choice for the Ansari Prize-winning Space Ship One flights. By combining hearing protection and communications in a system that can be worn comfortably in a wide range of mission profiles, ACCES has provided high performance, repeatable-fit products that help our peacekeepers perform their mission.

Ordering, Delivery, and Other Important Things

The Westone Philosophy

The Golden Rule. We treat people the way we would like to be treated. If you have a problem, we'll help you solve it. If we make a mistake, we'll correct it. Our goal is 100% customer satisfaction.

Earmold Orders

Average turnaround time is 24 hours from the time we receive your order. An in-house "rush service" is available for an additional \$10.00 per earmold. All finished products are returned to you via first class mail, at our expense, unless another shipping method is requested. We supply first class postage paid boxes and labels free of charge for your use.

If you need your order faster than first class mail, shipping services are available through FedEx, DHL, UPS or Postal Service Priority Mail. These services are offered at the discounted rates available to Westone. If you send us impressions via a rush service, please specify on your order form the method you would like us to use in returning the finished product. If no method is specified, we will return the order to you via the same method we received it and charge your account accordingly.

**Please note that our postage paid labels are for mailing earmold orders only! Please do not use these labels unless you are sending an earmold order using a standard impression box.*

Remake Policy

We will remake an earmold for free if:

- An earmold we sent out is lost in the mail
- We made an error in earmold style, material, or acoustic modification
- An earmold allows feedback or does not fit properly (90 day limit). Please note that open style molds (CROS, Free Field, high-frequency molds, etc.) are not guaranteed against feedback
- An earmold breaks within one year due to failure of materials or workmanship

We *will not* remake an earmold for free when:

- The wrong style, color, material or acoustic modification (resulting in occlusion or frequency response problems) is ordered by the dispenser
- Feedback or fit problems arise after 90 days
- The earmold is over one year old
- The earmold is lost

Special Requests

Need something that isn't in this catalog? Call us and let us know what you are looking for. Many of the earmold styles in this book are a direct result of requests from our customers.

Credit Terms and Policies

Our credit terms are net 30. Payment in full is due no later than the last day of the following month. At that point, unpaid invoices are considered 30 days past due. At 60 days past due, credit is suspended.

Schools, medical and government facilities should ensure that their account numbers appear on payments. Please advise your accounts payable department accordingly.

Past Due Accounts

Any account placed on a "No More Credit" basis three or more times during a six-month period will be placed on a C.O.D. basis for a period of six months.

If a C.O.D. order is refused or not paid for, the customer will be charged a 15% restocking fee and placed on a cash-with-order basis.

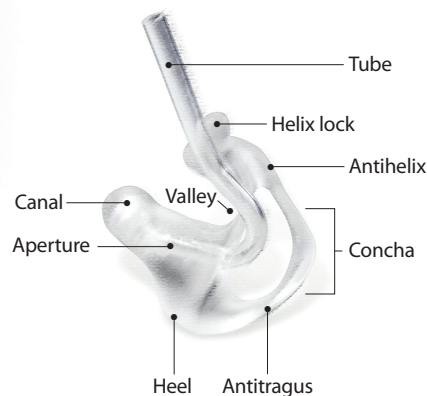
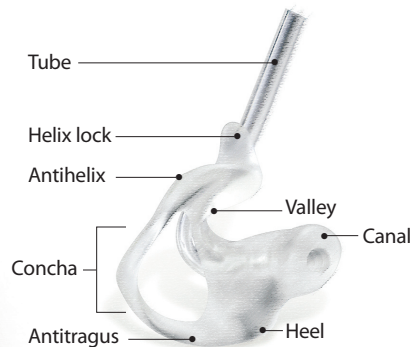
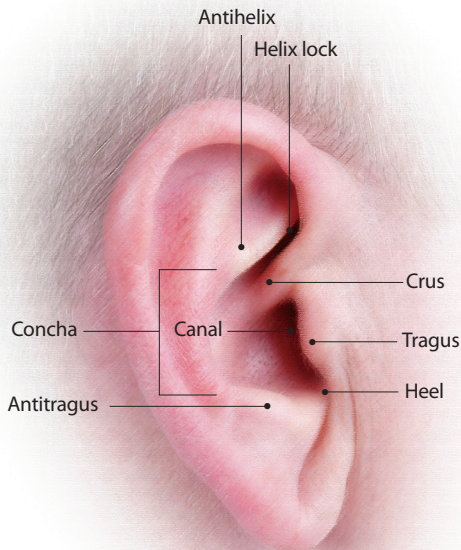
Westone Laboratories does not accept liability arising out of the use, the misuse or inability to use any product described herein offered for sale. The user assumes all risk and liability whatsoever in connection with these products.

The Ear and the Earmold According to Westone

When discussing critical information about anatomical features and fittings for an earmold or impression, it helps if the hearing healthcare professional and the lab share common terminology. Below you will find definitions for the most commonly-used terms describing the anatomical features of the ear, as well as illustrations showing those features highlighted on an earmold. You may find these illustrations and definitions useful when communicating with Westone about the design of your patient's earmold.

Ear Anatomy

The anatomical landmarks described here are of primary importance to the hearing healthcare provider. Several of these hold special significance for the creation of a proper fitting earmold.



Antihelix

A ridge of cartilage that is part of the pinna, just above the concha

Antitragus

A ridge of cartilage opposite the tragus

Aperture

The opening of the ear canal

Auricle or pinna

The external ear

Concha

The lower bowl-shaped cavity just outside of the opening of the ear canal

Ear canal

The 2 to 3 cm long external auditory meatus, consisting of an outer cartilaginous portion and an inner bony portion

Heel

The intertragal notch located at the bottom of the concha bowl

Helix lock (curl)

A recessed "crevice" at the upper part of the ear, just above the valley

Tragus

A small ridge in front of the external opening of the ear canal

Valley (earmold) crus (ear)

The horizontal piece of cartilage located outside the ear canal that divides the upper and lower parts of the ear

About Impressions

Because the ear impression is the blueprint from which any custom-fit product will be produced, the finished product can only be as good as the impression you make. Any deficiencies will greatly affect your patient's satisfaction with the finished product.

The procedures, techniques and processes discussed here are the culmination of years of experience in producing custom-fit products for the ear.

Impression Materials

Numerous tools and techniques have been used throughout the years to make impressions of the human ear. Recent advances in materials and procedures have led to the most consistent, dimensionally stable, and easy-to-use impression materials and delivery systems to date. Even so, only strict attention to the manufacturer's instructions ensures the best impressions possible.

There are three primary families of impression material available: ethyl methacrylate (powder and liquid), addition-cure silicone and two-part vinylpolysiloxane.

Powder and Liquid

Westone's BLEND® powder and liquid impression material has been available for several decades and produces a highly accurate impression. When using powder and liquid impression materials, remember three things: First, always use pre-measured material. A slight change in the ratio of liquid to powder can produce an impression that is either too wet, which can lead to drooping, or too dry, which can cause expansion of the ear canal. Second, always put the liquid into the mixing bowl first, followed by the powder. A glass mixing bowl and metal spatula are a must. Paper cups and tongue depressors actually absorb liquid, thereby altering the critical ratio of powder to liquid. Finally, remember that the curing process starts as soon as the powder and liquid come into contact. It is imperative that you work quickly while mixing the material and loading the impression syringe.

Powder and liquid impressions are susceptible to damage during shipping. As such, they need to be carefully packaged to avoid distortion. Secure the impression to the bottom of the shipping box with an adhesive, such as Duco Household cement, and keep the order form from contacting the cured impression.

Addition-Cure Silicone

Blue Silicast® can be mixed either by hand or using the "spleading" technique (page 9). As with powder and liquid impression material, it is very important not to deviate from the manufacturer's instructions. Blue Silicast is supplied in a tub with a tube of catalyst and a measuring scoop. Flatten the impression material in the palm of your hand and add the appropriate amount of catalyst. Mix the material for 20 to 30 seconds or until the material is a consistent color. Remember to work as quickly as possible. While it may be tempting to speed up the cure of the impression material by using a little extra catalyst, the minute that may be saved in cure time is not worth the risk of a possible ill-fitting earmold.



As with the powder and liquid material, once the two components have come into contact with one another, the curing process has begun. Work as quickly as possible to mix the material, load the syringe and make the impression.

Vinylpolysiloxane

The newest advancement in impression material is available in bulk containers, individual portion packs, or in specially formulated cartridges. Vinylpolysiloxane is now the most popular impression material in use today. Westone offers three different vinylpolysiloxane products to meet your needs:

Silicone Singles® (Silicast in single form) are available in premeasured units, making them extremely easy and convenient to use.

Silicast® comes in bulk containers with two different color scoops. It is important to accurately measure the two components to ensure proper curing.

SiliClone® and *SiliClone FIRM* are packaged in convenient cartridges for use with manual or electric impression guns. When propelled through the special mixing tip, they are automatically mixed and blended to the proper consistency. These are the easiest to use of all the vinylpolysiloxane products.

All vinylpolysiloxane impression materials provide accurate and dimensionally stable ear impressions. Once the impression has cured, simply place it in the mailing box along with the order form and ship.

Impression Tools

Oto-Dams

All oto-dams work on the same basic principle. An oto-dam is manufactured to a specific diameter from a material that has an inherent resistance to the reduction of that diameter. As the oto-dam is placed in an ear, it is compressed by the canal walls. The resistance of the oto-dam to this compression, or what is called “radial pressure,” holds the oto-dam in place against the force of the impression material. The two types of oto-dams in common use today are non-vented and vented.

Non-Vented Cotton Oto-Dams

Cotton oto-dams are soft, comfortable and function well. However, because of the manufacturing process, many cotton oto-dams are supplied as hard and compressed wads. To solve this problem, simply fluff the cotton oto-dam before use. The softer, more pliable the oto-dam, the more effectively and comfortably it will seal off the ear canal.

Non-Vented Foam Oto-Dams

Foam oto-dams are available in a wide variety of sizes and are soft, comfortable and easy to use. Size selection is the most common challenge in using a foam oto-dam. Be sure to choose the appropriate size for your patient, using visual inspection to ensure that it fits snugly in the ear canal.

Vented Dams

With any conventional oto-dam (foam or cotton), once the impression material has made full contact with the ear canal wall, any air trapped behind the dam is forced to compress against the eardrum. This sensation of ear “fullness” can range from minimal to significant discomfort. A vented foam oto-dam allows for the equalization of air pressure within the ear during the impression making, curing and removal process and significantly reduces any discomfort.

Impression Syringes

Historically, the syringe has been used to take impressions of the human ear, offering clean, quick and precise control of the impression material as it enters the patient’s ear. Syringes are available in several designs to work with specific impression materials.

Impression Guns

Impression guns effectively eliminate the guesswork associated with the mixing of materials through the use of dual-chamber cartridges and special mixing tips. The precise amounts of “a” and “b” components, propelled through the tip, are mixed for an ideal consistency prior to delivery into the ear.

Impression Techniques

Otoscopic Examination

Before making an impression, the patient's ear must be thoroughly examined and determined to be acceptable for the process. The exam not only allows you an overall view of the health of the ear, but also can reveal contraindications to impression-making such as:

- Impacted earwax
- Fluid discharge
- Bony growths (Exostosis)
- Inflammatory conditions
- Prolapsed canal
- Perforated eardrum
- Foreign objects
- Enlarged canal
- Thick hair growth
- Cauliflower ear
- Swimmer's ear
- Surgical ear

Oto-Dam Placement

Proper oto-dam placement is critical to providing for the safety of your patient and ensuring a successful earmold impression. The primary acoustic seal is established in the ear canal and is complicated by the fact that the ear canal actually changes dimension with jaw movement.

Use the otoscopic examination to gauge the size of the oto-dam you will use for your patient. An oto-dam with too small of a diameter allows the impression material to flow beyond the oto-dam and impinge on the eardrum. Too large of an oto-dam prevents proper placement in the ear canal at a depth required for a good impression. It can also cause discomfort for your patient. Apply Oto-Ease® lubricant to the oto-dam to make insertion easier and more comfortable. If the size you have chosen for the oto-dam does not seal the ear canal, remove it and try a different size.



Once you have selected the proper size, use the tip of the earlite to place the oto-dam into the ear canal and to make any slight adjustments. Use the otoscope to verify that the oto-dam is placed properly in the ear canal, checking to see that it is in full contact with the entire canal wall.

Earlite Use

The earlite serves as an aid in oto-dam placement. When using earlites and otoscopes, it is always important to hold the tool properly and to use proper bracing.

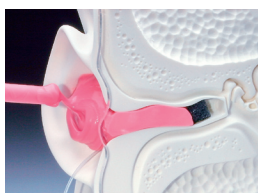
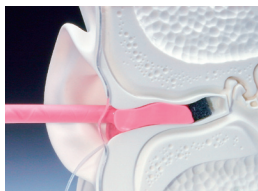
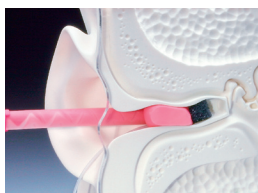
Caution: Proper bracing of the hand and tools being used is of paramount importance to the safety of the patient. During the impression process, some patients may experience a cough or gag reflex. This is a normal response due to stimulation of the vagus nerve. To avoid injury, always brace your hand to the patient's head by using your little finger. This will keep the tool in the same relative location to the ear in the event the patient coughs, jerks or moves suddenly.

Open Versus Closed Jaw Impressions

There has been much debate regarding open versus closed jaw impression techniques. Here at Westone, we believe that a jaw movement impression works well for vented hearing-amplification fittings. Bite-block/open jaw impressions should be taken for hearing protection products, musicians' products, and whenever acoustic feedback is the primary concern.

Impressing the Ear

Using the proper bracing technique, place the end of the mixing tip or syringe approximately 1/4 inch (6 mm) inside the ear canal opening. Gently begin to express the impression material into the ear canal, allowing the material to flow back over the syringe or mixing tip. Once the material starts to flow past the tip, start backing the tip out of the ear canal. It is critical that you fill all the landmarks in the ear. For instance, fill the concha bowl, move up into the antihelix crevice, then follow the contour of the ear, finishing at the center of the concha.



After about 4 to 5 minutes, check to see if the impression has cured. Press a fingernail or earlite tip gently into the material to see if an indentation remains. If there is no indentation and the material is not tacky, the impression is cured. It is then safe to remove.

Removing the Impression

The removal string or vent tube of the oto-dam should not be used as a handle to aid in removal of the impression. Instead, gently pull the patient's pinna up and back to break the seal. Remove the impression from the antihelix area and gently rotate forward and out. Should the oto-dam remain in the ear canal, the removal string or vent tube can be used to remove it.

Examine the ear for any material remaining from the impression process. Some slight redness may be evident and is normal. In the rare case that any impression material remains and cannot be easily removed, refer the patient to the appropriate medical authority for treatment.

Note: Prior to sending the patient home, inspect the impression to make sure that the necessary canal length and all anatomical landmarks are present.

How to SPLEAD

"Spleading" is a technique for mixing ear impression materials that reduces the chance of contamination. We've found that products containing sulphur—often found in latex gloves and hand lotions—can react with vinylpolysiloxane impression materials, preventing proper setup. Spleading is recommended for Silicone Singles and other silicone materials. All you need is our SPLEAD pad, metal spatula, silicone syringe ... and our great impression material.



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

Easy steps for spleading:

Open the Silicone Singles packet. Use a metal spatula to remove the materials (Figure 1) and place them on the SPLEAD pad (Figure 2).

Mix the two materials together by blending them with the spatula, like artists mix paints (Figure 3). Don't touch the materials with your hands! Continue mixing until the material is a uniform color (Figure 4).

To load the silicone syringe, remove the plunger and place the chamber of the syringe on the SPLEAD pad at a slight angle (Figure 5). Using the syringe chamber like a cookie cutter, press down on the material, progressively scooping up the material until all of it is loaded in the syringe (Figure 6). Put the plunger back into the syringe to complete the loading process. Tear off and discard the top sheet of the SPLEAD pad before mixing the next packet.

Earmold Materials and Colors

Westone offers a wide range of earmold materials, ranging from the softest silicone to traditional hard acrylic. Available in a wide variety of both natural and vibrant colors, Westone earmolds are manufactured to fit any need or requirement.

Acrylic Materials

Acrylic is available in clear, tint (light pink), beige, brown, DisappEar™ (pink, beige and brown) and a wide variety of custom colors. For additional color options please refer to “Earmold Material Guide” or westone.com.

FIT

Our newest earmold manufacturing process, using laser scanning technology and stereolithography equipment, results in highly precise and accurate acrylic earmolds that are not possible using any other manufacturing method.

Flex Canal

A body-temperature reactive material available for acrylic earmolds.

e-Compound Additive

Additive that reduces feedback by diffusing reflected sound between the tip of the earmold and the eardrum. Available in both hard and body-temperature reactive formulations.



DisappEar

This remarkable earmold material virtually vanishes when inserted in the ear. Our unique manufacturing process embeds microfibers in the material that work just like camouflage, breaking up the earmold's outline and reflection. DisappEar is available in three different colors, pink (A), beige (B) and brown (C), to blend with almost any skin tone, in your choice of hard acrylic or soft silicone materials.

Earmold Material Guide

Material texture	Material name	Canal additives	Standard colors	Optional colors
Hard	Acrylic	Flex canal e-Compound	Clear Tint (light pink) Beige Lt/Md/Dk Brown	DisappEar A, B, C Neon Glitter LuminEar Custom colors
	FIT	None	Clear	None
Soft vinyl	Formula II	None	Beige, Lt/Md/Dk Brown	Neon, Vinyl Marble
	Formula II Clear	None	Clear, Brown	Custom Colors
	Rx	None	Tan, Lt/Md/Dk Brown	None
	Superflex	None	Translucent pink	None
Soft silicone	Frosted Flex	e-Compound	Frosted opaque	None
	Mediflex	e-Compound	Beige	None
	OtoBlast	e-Compound	Clear, white, black, red, blue, yellow, orange, green, forest green, pink, gray, purple, beige, brown	DisappEar A, B, C Neon Glitter
Super soft silicone	W-1		Clear Translucent pink Lt/Md/Dk Brown	DisappEar A, B Neon Glitter LuminEar
Floatable silicone	AquaNot™/Swyrl™	None	White, black, red, blue, yellow, orange, green, forest green, pink, gray, purple, beige, brown	None

Please visit westone.com for color information.

Injection Molded PVC (Polyvinylchloride)

Formula II (F-2)

Standard soft vinyl material is available in light tan or brown (light, medium or dark). For additional color options, please refer to the "Earmold Material Guide" or westone.com.

Formula II Clear (F-2C)

Same material as F-2 but clear. Formula II Clear can also be tinted in a wide variety of colors. For additional color options, please refer to "Earmold Material Guide" or westone.com.

Rx

The finest, softest vinyl material, available in medium tan or brown (light, medium or dark).

Superflex

Pink, semi-transparent color.

Neon PVC

Available in four bright neon colors: pink, green, orange, and yellow.

Vinyl Marble

White PVC swirled with your choice of one of these eight colors: black, blue, pink, yellow, orange, purple, green and red. For additional color options please refer to the "Earmold Material Guide" or westone.com.

Silicone Materials

Mediflex

Soft, medical-grade silicone is chemically stable and hygienically pure. Tubing is secured with a TRS ring.

Frosted Flex

Same medical-grade silicone as Mediflex. Has a frosted opaque appearance. Ideal for allergy cases. Tubing is secured with a TRS ring.

OtoBlast™

Soft, medical-grade silicone. Base material is crystal clear, with many vibrant colors available. Tubing is secured with a TRS ring. Also available in DisappEar.

W-1

Very soft, colorless, silicone material that provides the maximum in comfort and seal. Tubing is secured with a TRS ring. Also available in DisappEar. For additional color options, please refer to the "Earmold Material Guide" or westone.com.

e-Compound Additive

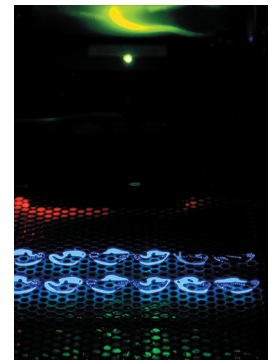
Can be added to the canal portion of Mediflex, Frosted Flex and OtoBlast silicone earmolds. Reduces feedback due to the sound reflection between the tip of the earmold and the eardrum.

AquaNot / Swyrl

The ultimate in comfort for swim plugs and hearing protection earmolds. Available in 13 fun, bright colors: white, black, red, blue, yellow, orange, green, forest green, pink, gray, purple, beige, and brown. Swyrl is a mix of up to three of the available colors.

Polyethylene

A semi-hard, waxy material used only in cases of extreme allergies. Available in pink or white.



FIT™

The future of earmolds is at Westone...now! We call it FIT technology. Today at Westone, we're making custom earmolds with computer-controlled scanning hardware so precise that it scans up to 100,000 points on a single ear impression. Using state of the art three dimensional software, the virtual earmold is then modeled by our skilled technicians.

The computer interfaces directly with sophisticated 3D stereolithography equipment to build the earmold, layer by layer. Our technicians finish each earmold by hand, using the same care and precision that has been Westone's calling card since 1959. The result is a custom earmold made with a precision and accuracy not possible with any other method. By dispensing the world's most accurate earmolds, you may find yourself with the world's most satisfied customers.

Tips and Guidelines for Earmold Material Selection

Many decisions are needed in order to successfully fit your patients with hearing instruments and earmolds. The following are simple guidelines based on our nearly 50 years of making custom-fit products for the ear.

Discomfort

If you suspect that discomfort might be an issue, there are a few things to consider before selecting an earmold material. First, check your patient's skin texture. If the skin texture is firm, consider using a soft earmold material. If your patient's skin is soft or delicate, as can often happen with elderly patients, try using a firmer earmold material.

The helix area of an earmold can sometimes cause problems. Many earmold styles do not require a helix to ensure a secure fit. You can reduce potential problems by ordering a 3/4 or 1/2 shell-style earmold. This is a particularly good choice for patients who may experience difficulty inserting the earmold into the ear.

Loose Fit

If loose fit is a concern (i.e., the patient's ear is very soft), consider using a stiffer material for the earmold, such as acrylic (see the fitting range charts). If you are using a soft material, a bulkier earmold style might be helpful.

Allergies

Use Mediflex or Frosted Flex silicone earmold material if allergies are a concern. However, earmolds made from silicone can be abrasive to delicate skin, particularly in elderly patients. Select acrylic or vinyl earmold materials that have been boiled in saline solution as an alternative to Mediflex or Frosted Flex. Polyethylene earmold material is available for extreme allergy situations.

Mandibular Action

Use the softest earmold material possible for fitting a patient with severe mandibular action. Consider tapering the canal or specify a KC (hollow) style that will allow the earmold to flex with jaw movement.

Tubing

Tubing can cause problems if not chosen properly. Keep in mind that tubing cannot be glued into silicone earmolds. When the tubing is used as a handle to remove the earmold, it can become dislodged. This is especially a concern with children, elderly patients, or those with limited dexterity.

Feedback

If you suspect that feedback could be a problem, use a bite-block, deep-impression technique. Consider using a silicone material if the patient's skin texture will allow. If acoustic modifications will permit, always tube the earmold through and vent conservatively.



Venting, Sound-Bore Modifications and Acoustics

Earmold Sound-Bore Guidelines

With the advent of digital hearing instruments and signal-processing technology, a section on basic earmold acoustics may soon become passé. For now, however, there are three common ways to control the amplified signal of a hearing instrument once the signal leaves the receiver; venting, dampers, and sound-bore modifications.

Venting typically affects frequencies below 750 Hz. In general, the larger the vent, the more low-frequency energy is “bled off.” By using different vent diameters, varying amounts of low-frequency amplification can be reduced. Earmold venting can range from totally open or non-occluding styles to very precise and interchangeable venting via a vent control insert such as a mini vent plug (MVP).

Open earmold fittings are earmolds with very large vents. These types of earmolds can be quite effective for hearing losses that do not require low-frequency amplification. They allow the patient to perceive low-pitched sounds naturally (through the open vent), while using an instrument for high-frequency amplification. Reduction or elimination of the occlusion effect is an added benefit for the patient.

Damping primarily affects frequencies between 1 and 3 kHz due to the effect the damper has on the resonant peaks of the hearing instrument. As the name suggests, the damper dampens or smooths out the frequency response of a hearing instrument. As a result, the sound quality of the hearing instrument is much more natural, with feedback less likely. Dampers can be fit to the ear hook, the earmold tubing or the sound bore of the earmold. The location determines the amount of smoothing the damper will achieve. The closer the damper is to the end of the signal chain, the greater its effect on smoothing response peaks.

The size and shape of the sound bore can also control the frequency response of the earmold/hearing instrument combination. Changes in bore diameter can affect frequencies at 1.5 kHz and above. Larger sound-bore diameters and tubing can result in a 3 to 5 dB gain above 1.5 kHz, such as the case with a half tubed earmold. Additional high-frequency gain can be realized by specifying a Libby Horn tube. Smaller tube diameters can also reduce high-frequency gain, as needed for reverse-slope hearing losses.

Proper use of these basic acoustic principles can improve the performance of even the most sophisticated digital instrument.

Sound-Bore Glossary



Large bore (LB) (horn effect)
A 4 to 5 mm bore at the end of the canal that mimics the horn effect and helps increase high frequencies.



Small bore (SB) (reverse horn effect)
A 1 mm bore that helps boost perceived low frequencies by reducing high frequencies.



Open bore (OB)
Commonly used with gently sloping, high-frequency losses. The canal is cut short and “hollowed.” An example is Westone’s Style No.10 Earmold.



Fishmouth (FM) (bell bore)
Not a true acoustic modification, but rather a beveled cut in the end of the sound bore that acts as a cerumen trap.

Venting Glossary



Angle vent (AV)
The vent intersects the sound bore between the end of the tubing and the end of the earmold canal.



Half external vent
A channel from the canal tip to the aperture that transitions to an internal vent. Used when drainage or discharge from the ear is a problem.



Parallel vent (PV)*
The sound bore and the vent travel through the earmold side-by-side and do not intersect.



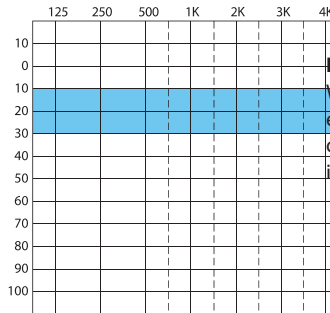
Mini vent plugs (MVP)
Normally drilled with a 3 mm diameter bore. MVPs come with each of the following vent sizes: #1 (2.5 mm), #2 (2 mm), #3 (1.5 mm), #4 (1 mm), #5 (0.8 mm). Includes one solid plug.

**We always drill vents parallel as a default if no vent configuration is specified. If the physical size of the earmold or acoustic requirements prevent us from using a parallel vent, we will install an angle vent.*

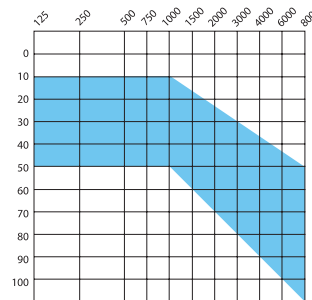
Venting, Sound-Bore Modifications and Acoustics

Westone Fitting Ranges

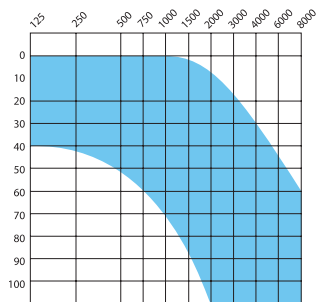
The following examples of fitting ranges should be used as guidelines only. Any acoustic modifications to the earmold and the response of the specific hearing instrument must be considered.



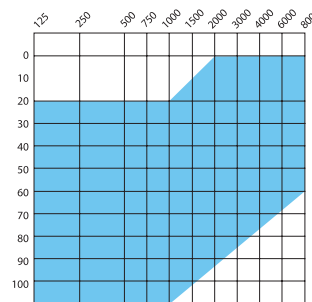
Fitting range 1
When tubed through to the end of the canal, the constant diameter sound bore will not increase highs.



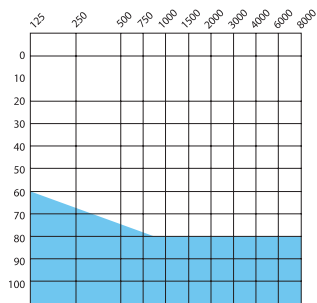
Fitting range 2
A large bore, CFA or Libby Horn increases highs 8 to 12 dB from 2 to 5 kHz. Use a MVP system to alter perceived low frequencies.



Fitting range 3
A non-occluded or acoustic modifier style earmold increases highs in "ski slope" losses. Use a MVP system to alter perceived low frequencies.



Fitting range 4
A 1 mm small bore or a CFA reverse curve adapter decreases high frequencies. A pressure vent is the only vent recommended with this loss.



Fitting range 5
Uses a standard bore and regular tube. A pressure release vent is recommended to avoid feedback.



A Horse of a Different...

Over the years, Westone has been called on to solve a number of unique problems. For example, we made a toe spreader for a podiatrist's patient, an entire external ear and earmold for a customer, and a batch of earmolds for laboratory mice! We've even made sound suppressors for a nervous horse, so it wouldn't be frightened by crowd noise.

What this proves is that, with our technology and a bit of ingenuity, we can develop almost anything if it can be made from oto-plastics. Call us if you have a special need and we'll put our experience to work for you.

Note; CFA audiograms 7 and 8 are open CROS style earmolds.

Feedback can occur with the use of instruments that promote high-gain, high-frequency improvements.

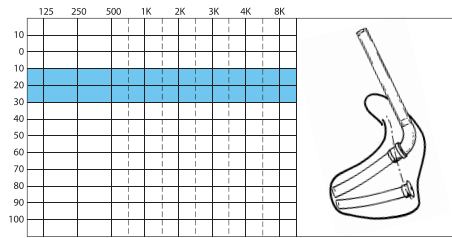
Audiograms 7, 8 and 9 are not guaranteed against feedback.

CFA Fitting Ranges

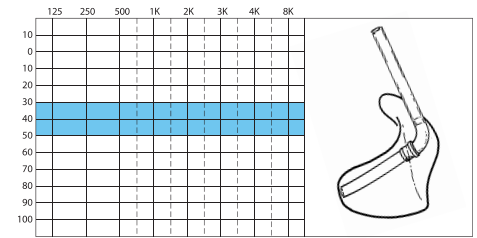
Earmolds incorporating continuous flow adapter (CFA) bore and vent configurations can significantly enhance the success of your hearing instrument fittings, providing smooth, comfortable, high-frequency amplification. CFA earmolds have been shown to:

- Eliminate the acoustic problems created by pinched or crimped tubing
- Allow users to easily clean and maintain earmolds
- Eliminate the need to insert acoustic dampers in the tubing to smooth out the frequency response

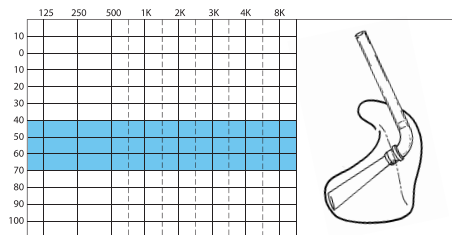
The accompanying audiograms are based upon several years of research on earmold boring and venting. Use them to assist you in choosing the best CFA earmolds for your patients' hearing instruments. Bore and vent options can be selected to match your desired acoustics.



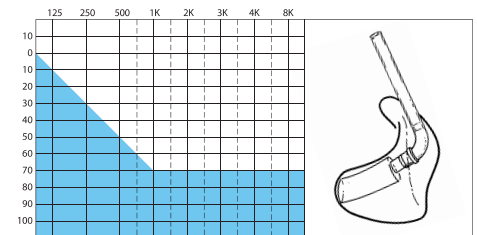
Audiogram 1. Bore #1 with MVP
Does not increase highs.
Comes standard with a MVP.



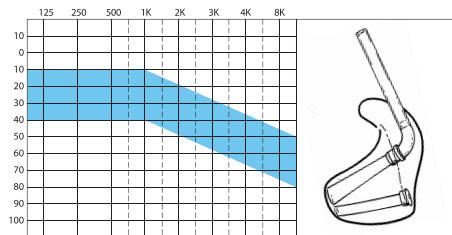
Audiogram 2. Bore #1, no vent
Does not increase highs.



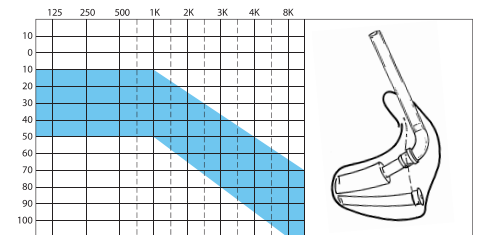
Audiogram 3. Bore #2, no vent
Flared sound bore increases highs slightly between 2 and 5 kHz.



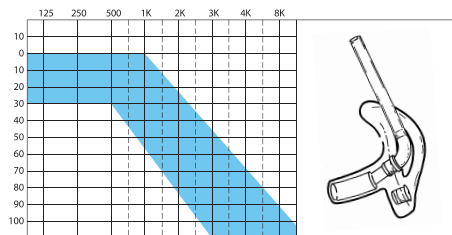
Audiogram 4. Bore #4, no vent
Increases highs 10 to 20 dB over conventional earmolds between 2 and 5 kHz and smooths peaks and valleys. If feedback occurs, simply remove the CFA and replace it with a reverse curve adapter.



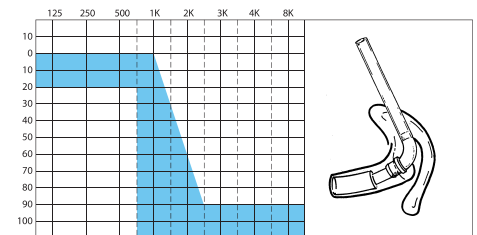
Audiogram 5. Bore #2 with MVP
Flared sound bore increases highs slightly between 2 and 5 kHz.
Comes standard with a MVP.



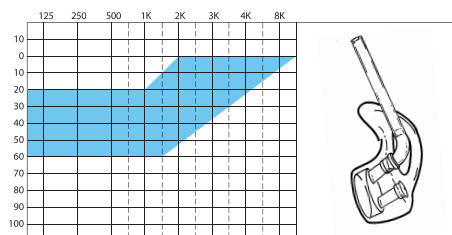
Audiogram 6. Bore #3 with MVP
Stepped sound bore increases highs 8 to 12 dB between 2 and 5 kHz. Comes standard with a MVP.



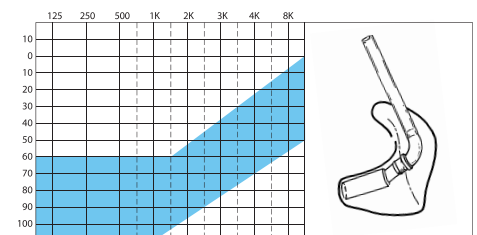
Audiogram 7. Style No. 12 only. Bore #4 Micro CROS
Reduced canal diameter increases comfort. Heel area of earmold left full for a MVP. This style increase highs 10 to 20 dB over conventional earmolds between 2 and 5 kHz. Feedback can occur with the use of instruments that promote high-gain, high-frequency improvements.



Audiogram 8. Style No. 52 only. Bore #4 Micro CROS
Non-occluding earmold allows lows to enter naturally. Increases highs 10 to 20 dB over conventional earmolds between 2 and 5 kHz. Feedback can occur with the use of instruments that promote high-gain, high-frequency improvements.



Audiogram 9. Style No. 10 only. Bore #5 with MVP
Cuts highs 8 to 12 dB and increases lows slightly.
Comes standard with a MVP and a reverse curve adapter.

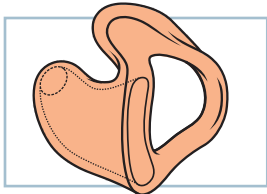


Audiogram 10. Bore #5-Long canal, no vent
Cuts highs 8 to 12 dB and increases lows slightly.
Comes standard with a reverse curve adapter.

Hearing Instrument Earmolds

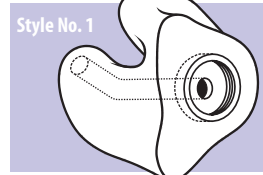
At last count, Westone has made over 10 million earmolds.

Even so, we approach each earmold as if it is the most important one we've ever made. While hearing healthcare is indeed a science, making a great earmold is still an art. No one has yet come up with an acceptable substitute for the sensitivity of the human hand, the experience of the human mind, or the judgment of the human eye.



Ear Openers/Stents

Our "ear opener" earmolds hold collapsing ear canals open. Sometimes the tissue of the canal becomes very soft and flaccid, to the point of losing its definition. When this happens, the canal can become occluded, causing a conductive hearing loss. This can be corrected by opening the ear canal using a stent made from acrylic material. "Ear opener" earmolds are available in style numbers 2, 3, 3 Inverted, 4, 5, 6, 6 Thick and 8.



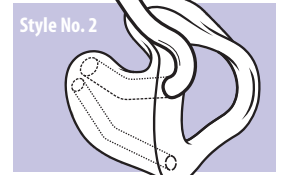
Applications
(Snap ring) Body instruments, auditory trainers and stethoscopes (with an Adapt-a-scope adaptor), communications. Works with some StarSet®, Plantronics®, and Telex® headsets

Fitting ranges
1, 2, 3, 4, 5 (depending upon acoustic modifications)

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
Large bore, small bore, fishmouth, vent

Options/accessories
Adapt-a-scope, male adapter, colors, glitter, wire retention adapter, venting, initials



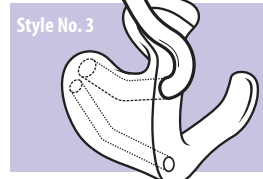
Applications
(Skeleton) Amplification, telecommunication, teleprompter, law enforcement, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 3, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, venting and tube options, initials, wire retention adapter, T-Mic



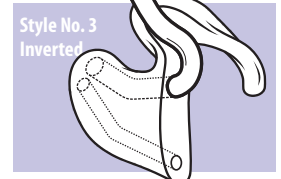
Applications
(Semi-skeleton) Amplification, telecommunication, teleprompter, law enforcement, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 3, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, venting and tube options, initials, wire retention adapter



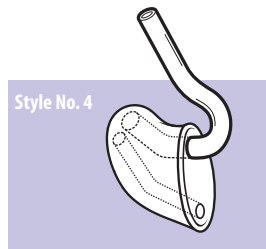
Applications
(Semi-skeleton) Amplification, telecommunication, teleprompter, law enforcement, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 3, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, venting and tube options, initials, wire retention adapter



Style No. 4

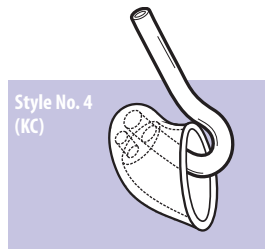
Applications
(Canal) Amplification, communications, teleprompter, Secret Service, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 3, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent

Options/accessories
Colors, glitter, venting and tube options, initials



Style No. 4 (KC)

Applications
(Canal) For cases of pronounced mandibular action and/or severe feedback

Fitting ranges
4, 5

Available materials
Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound

Modifications
Pressure vent only

Options/accessories
Colors, initials, venting (pressure)



Style No. 4VH

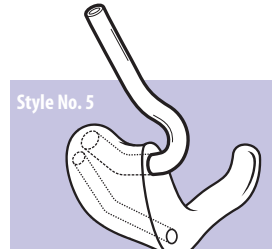
Applications
(Canal) Hollow canal-style mold, slim tube open fittings

Fitting ranges
N/A

Available materials
FIT

Modifications
N/A

Options/accessories
Tubing (slim tube, 13 medium)



Style No. 5

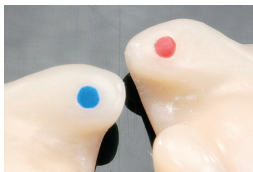
Applications
(Canal lock) Amplification, communications, teleprompter, law enforcement, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, OtoBlast, OtoBlast DisappEar, Cat Eyes

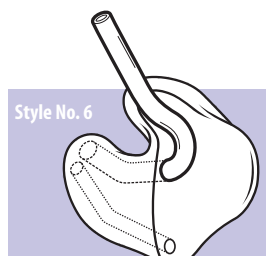
Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, initials, venting and tubing options



Left and Right Indicators
Left and right indicators can be added to just about any earmold. At Westone, we add a blue dot to indicate the left side and a red dot to indicate the right side of all our hearing protection products, but we can install right and left indicators to any earmold if you request them.

AquaNot and Swyrl swim-plugs are supplied with "L" and "R" side indicators.



Style No. 6

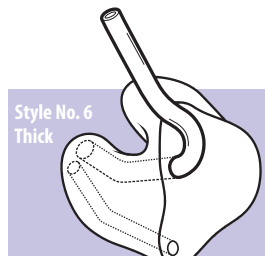
Applications
(Shell) Amplification, communications, teleprompter, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, initials, venting and tubing options, wire retention adapter



Style No. 6 Thick

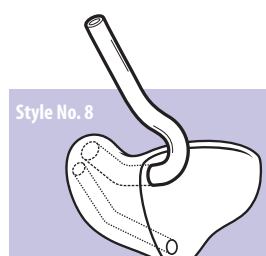
Applications
(Thick shell) Amplification, communications, teleprompter, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, initials, venting and tubing options, wire retention adapter



Style No. 8

Applications
(Half shell) Amplification, communications, teleprompter, stenotic ear opener (order "ear opener" on the comment line of the order form, available in Acrylic only)

Fitting ranges
1, 2, 4, 5

Available materials
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, FIT, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications
CFA, large bore, small bore, fishmouth, vent, power mold, cut back vent

Options/accessories
Colors, glitter, initials, venting and tubing options, also available as a half-shell (8-Thick)

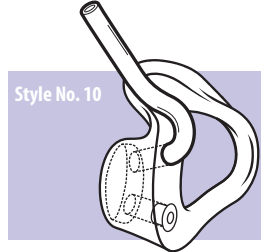
Hearing Instrument Earmolds

Westone makes custom earmolds for virtually every application you will encounter. If you're not certain which version might be the best choice for your patient, call us. Our technical support staff (1-800-525-5071) can help you select the style and material that is most appropriate.



An Easy Way to Clean Vents

For those very small vents on hearing instruments or earmolds, try cleaning them with a dental floss loop (designed for cleaning braces and bridge-work). The stiff end can be used for pressure vents. Larger vents can be cleaned by using a wax loop or pipe cleaner.



Style No. 10

Applications

(Acoustic modifier) Normally used for mild high-frequency loss, comes standard with open bore and MVP (not guaranteed against feedback)

Fitting ranges

3

Available materials

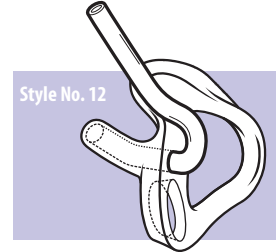
Acrylic, Acrylic with Flex Canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications

CFA

Options/accessories

Colors, glitter, tubing options and initials



Style No. 12

Applications

(Non-occluding) For high-frequency losses, Tinnitus Masker, open fit hearing instruments, CROS and BICROS fittings, open platform fittings, and cochlear implants (not guaranteed against feedback)

Fitting ranges

2, high-frequency loss

Available materials

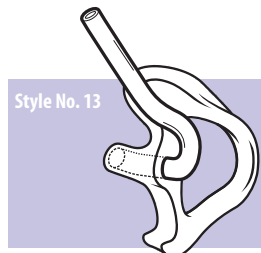
Acrylic, Acrylic DisappEar, Formula II, Formula II Clear, Superflex, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications

CFA, large bore, MVP

Options/accessories

Colors, glitter, tubing options and initials



Style No. 13

Applications

(Non-occluding) For high-frequency losses, Tinnitus Masker, open fit hearing instruments, CROS and BICROS fittings, open platform fittings, and cochlear implants (not guaranteed against feedback)

Fitting ranges

2, high-frequency loss

Available materials

Acrylic, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications

None

Options/accessories

Colors, glitter, tubing options and initials



Style No. 14

Applications

(Non-occluding) For high-frequency losses, Tinnitus Masker, open fit hearing instruments, CROS and BICROS fittings, open platform fittings, and cochlear implants (not guaranteed against feedback)

Fitting ranges

High-frequency loss

Available materials

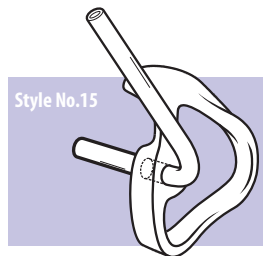
Acrylic, Acrylic DisappEar

Modifications

None

Options/accessories

Colors, initials



Style No. 15

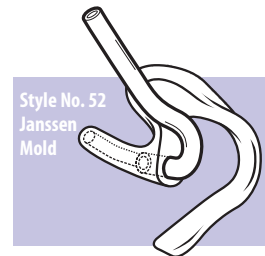
Applications
 (Free field) For high-frequency losses, Tinnitus Masker, open fit hearing instruments, CROS and BICROS fittings, open platform fittings, and cochlear implants (not guaranteed against feedback)

Fitting ranges
 High-frequency loss

Available materials
 Acrylic, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Modifications
 CFA, large bore, small bore, fishmouth, vent, power mold (cut back vent)

Options/accessories
 Colors, initials



Style No. 52 Janssen Mold

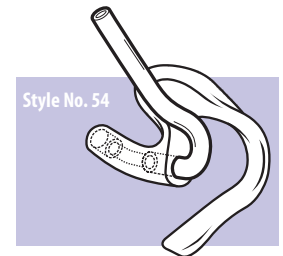
Applications
 (Non-occluding) Replicates a tube-only fitting; also used with high-pass earhooks (not guaranteed against feedback)

Fitting ranges
 N/A

Available materials
 Acrylic, Acrylic DisappEar

Modifications
 None

Options/accessories
 Colors, initials



Style No. 54

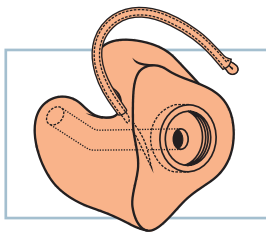
Applications
 (Non-occluding) Delicate earmold, designed for use with ER-12-1 earhook (not guaranteed against feedback)

Fitting ranges
 N/A

Available materials
 Acrylic, Acrylic DisappEar

Modifications
 None

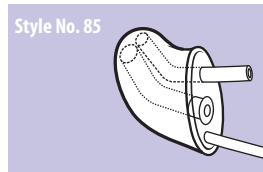
Options/accessories
 Colors, initials



Wire Retention Adapter

Over the years, the size and quality of hearing instruments have changed. The standard receiver used during the 1970s was much larger and heavier than today's counterparts.

Fitting a small child with a receiver-type fitting can be a problem when the pinna is too small or too soft to support the weight of the receiver. The solution is a Wire Retention Adapter. This tubing-coated, flexible wire attaches to the earmold and is formed over the ear just like a pair of wire-frame glasses. The weight of the receiver is supported by the wire over the ear, which allows the earmold to sit naturally and comfortably in the pinna. It's a simple and highly effective solution.



Style No. 85

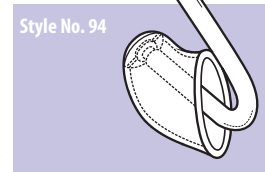
Applications
 (Canal) Specific to thin tube diameter, open-fitting hearing instrument. Use where vent must be controlled (not guaranteed against occlusion)

Fitting ranges
 High-frequency loss

Available materials
 Acrylic, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Modifications
 Vent

Options/accessories
 Colors



Style No. 94

Applications
 (Canal) For use with ReSound® Flex Vent System, Canta 7™, Metrics 770 D™, Air™ hearing instruments

Fitting ranges
 High-frequency loss

Available materials
 Acrylic, Acrylic DisappEar

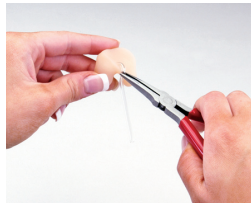
Modifications
 None

Options/accessories
 Colors

Retubing an earmold can be frustrating. By using the tools and techniques described in this section, you will be able to quickly and efficiently remove old tubing and install new tubing on your patients' earmolds. Never use powered drill bits or cutting burrs when trying to remove old tubing from an earmold because you can quickly alter the inside diameter of the sound bore and render the earmold useless.

Removing Old Tubes and Cleaning Sound Bores

There are two quick and easy ways to remove old tubing from earmolds. If you have a microwave available in your office, bring a small glass container filled with water to a rolling boil. Our powder and liquid impression mixing bowl works well in this application. While the water is still actively boiling, drop the earmold you wish to retube into the container. Once the water is cool enough to take the earmold out, remove it from the still warm water and use a small pair of needle nose pliers to remove the old tube. A sharp tug should be all that is required to pull the tubing free from the earmold.



The second way to remove tubing from an earmold is to use a Westone hand reamer. Simply cut the tubing flush with the outside surface of the earmold, insert the hand reamer and rotate in a clockwise direction. The drilling action will remove the old tubing from inside the sound bore. After you have removed the old earmold tubing with either method, inspect the sound bore for any remaining debris. Any debris left in the sound bore can have an effect on the high-frequency response or completely block sound transmission.



Half Tubing

After cleaning the sound bore, hold the new tube against the earmold canal and gauge approximately where you want the tube to end in the sound bore. Clip the tubing straight across. (Note: it is very important that the tubing be cut at 90 degrees to the tube sidewall.)



Pour a small amount of tubing cement (thin cement for acrylic earmolds, vinyl cement for vinyl earmolds) in a small cup or bowl. The following steps must be performed quickly: dip the end of the tube into the cement, and then tap the tube against the sides of your cement container until only a small amount of cement remains in the tube end.



Place the tube over the sound bore in the earmold base, then pinch the tube and quickly insert it into the sound bore. Pinching the tube causes the cement inside the tube to coat the wall of the sound bore, acting as a lubricant during tube insertion and then securing the tube when it dries. Make sure the tube is at the proper angle and allow it to dry. You are now ready to refit the instrument.



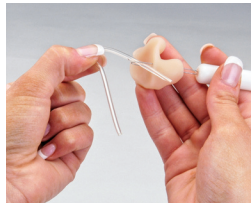
Tube-Through Retubing of Acrylic and Vinyl Earmolds

Use a small amount of the appropriate cement on a pipe cleaner to clean the sound bore along the entire length.

From the canal tip, insert a tube puller into the earmold (monofilament for acrylic earmolds, wire for soft earmold materials).

Place the quilled end of the tube through the loop of the tube puller and pull through the earmold. When the tube is all the way through, adjust the tube by hand until you have it at the proper angle.

Pull the tubing away from one side of the sound bore and apply a small amount of cement. Capillary action will cause the cement to flow around the entire tube. When the glue is dry, cut the tube flush with the end of the canal. You are now ready to refit the instrument.



Tube-Locks and TRS Tubes

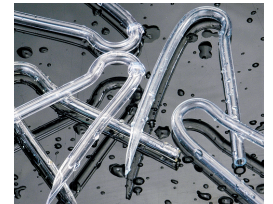
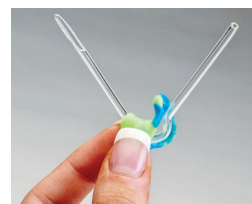
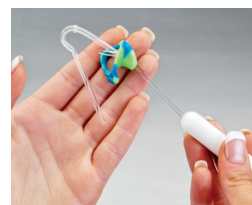
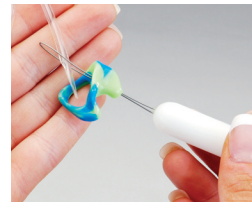
Cut the old tube flush with the outside of the earmold. Insert a tube-lock tool into the base of the earmold and push the remaining tube and tube-lock or TRS tube out of the earmold through the canal tip. Make sure the sound bore is free of any obstruction.

Insert a wire tube puller into the sound bore from the canal end.

Thread the quilled end of the tube-lock or TRS tube through the tube puller and then pull the tube into the earmold.

Pull the quilled end of the tube and gently work the tube-lock or TRS sleeve into the earmold.

Continue manipulating the earmold and tube until the tube-lock or TRS is 3 mm below the outside surface of the earmold. Once the tube is in the proper position, trim the excess tube from the canal end and refit the instrument.



Keeping Tubing High and Dry

In areas of high humidity, water droplets can form inside the tubing in BTE fittings. When enough of these droplets form, they may bridge the tubing walls and effectively occlude the sound channel. To your client, it might sound like the instrument is cutting out. Venting the earmold (if possible) and using a Dry-Tube will help eliminate the problem.

Westone tubing size chart

○ #12 Standard	.085 ID x .125 OD
○ #13 Medium	.076 ID x .122 OD
○ #13 Thick	.076 ID x .130 OD
○ #13 Super thick	.076 ID x .142 OD
○ #15 Standard	.059 ID x .116 OD
○ #16 Thin	.053 ID x .085 OD
○ #16 Standard	.053 ID x .116 OD

Note: Tube sizes are measured in inches, ID for inner diameter and OD for outer diameter.

Communications and Occupational Earmolds

Westone has worked closely with pilots, doctors, television personalities, and communications professionals to develop highly-effective earpieces that bring new levels of comfort and efficiency to their professions. Several of our earmolds are designed specifically to work with the most popular headsets on the market, while others can be readily adapted to unique requirements.

Communications Earmolds

The most commonly used communications earmolds are the Westone No. 1 and No. 19 Styles. They are available in both soft vinyl and hard acrylic materials. All communications earmolds come standard with a vent. If ordering Style No. 1, please let us know if the earmold is to be used for a hearing instrument or a communications application. The No. 19 SwivelComm™ Earmold incorporates a ball and socket attachment that provides for 3-axis pivoting of the mounting bar. This allows the user to move the microphone out of position and then reposition it without removing the earmold.

In a noisy work environment, some people choose to have a noise filter installed in the vent and wear a filtered sound attenuator in the opposite ear. We can also split the signal and feed both left and right ears with the use of a “Y” adapter.

The Westone No. 1 Earmold works with both the Telex “Earset” and the Plantronics “StarSet” as well as with the Telex PEV 77, PEM 77 and the PEM 78. Westone Style No. 19 works with the Plantronics MS-30, MS-50 and MS-57, the Telex 5x5 Pro III and 5x5 Mark IIA. If the communication system you are working with is not listed, call us. There is a good chance we can design something that will work well for you.



Removal Handles

Earmolds can sometimes be very challenging to remove for patients with dexterity problems. A removal handle can be specified for most hearing instrument earmolds.

AquaNot earmolds come standard with removal handles; hearing protection earmolds can be ordered with a removal handle. Canal-style hearing protection earmolds come standard with a removal handle that is cut to the appropriate length by the end user.



Stethoscopes and CIC/ITC instruments

Westone has a specialty earmold, Style No. 28, for individuals who wear a CIC or ITC hearing instrument and also need to use a stethoscope. This style requires that you send the stethoscope to us so we can attach the earmold adaptor.

Note: The ear impression must be made with the hearing instrument in place and marked with the microphone location.

Components of stethoscope fittings

The comfort and sound quality provided by custom earmolds have become popular among medical professionals. The following items are all that is required for a custom stethoscope:

Westone earmold Style No. 1

Material choices run from clear acrylic to soft silicone.

Stethoscope tubing

Large diameter, flexible Scope tubing.

Adapt-a-scopes

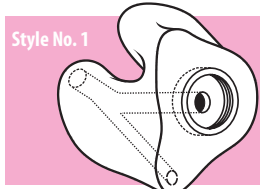
The metal adapters that snap onto the earmold receiver bushing and accept the Scope tubing on the nipple end.

Y-adapter

Connects the diaphragm to the custom binaural fitting.

A typical binaural fitting includes left and right Style No. 1 earmolds, two Adapt-a-scopes, one Y-adapter and four feet of Scope tubing.

A typical monaural fitting includes one Style No. 1 earmold, one Adapt-a-scope and three feet of Scope tubing.



Style No. 1

Applications

With standard snap ring for stethoscopes (with an Adapt-a-scope adaptor), communications. Works with some StarSet, Plantronics, and Telex headsets

Available materials

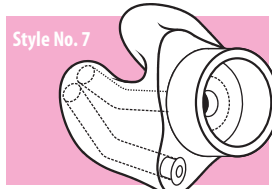
Acrylic, Acrylic with Flex Canal, Acrylic with hard or soft e-Compound canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Mediflex with e-Compound, Frosted Flex, Frosted Flex with e-Compound, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Modifications

Large bore, small bore, fishmouth, vent

Options/accessories

Adapt-a-scope, male adapter, colors, wire retention adapter, venting, initials



Style No. 7

Applications

(Thick shell) Adapts cellphone headsets and button style stereo headphones to custom earmolds

Available materials

Acrylic, Acrylic with Flex Canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, OtoBlast, OtoBlast DisappEar, Cat Eyes

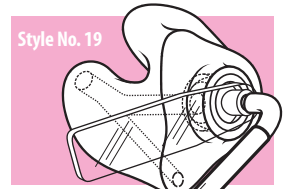
Modifications

N/A

Options/accessories

Colors, glitter, also available in iPod® white, initials

Note: Comes standard with MVP.



Style No. 19

Applications

(Thick shell) For use with the Plantronics MS-30, MS-50 and MS-57, the Telex 5x5 Pro III and 5x5 Mark IIA

Available materials

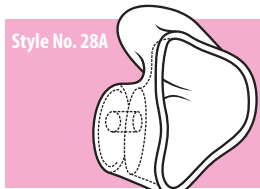
Acrylic, DisappEar Acrylic, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Modifications

Vent

Options/accessories

Filter in vent bore, colors, initials



Style No. 28A

Applications

(Thick shell) Allows CIC instrument users to effectively use stethoscopes

Available materials

Acrylic, Acrylic DisappEar, FIT

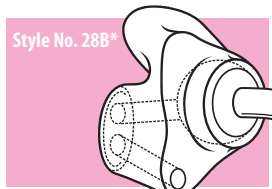
Modifications

N/A

Options/accessories

Colors, initials

Note: Please take impression with CIC instrument in place. Be sure to cover the vent and microphone openings with tape to prevent impression material from entering these openings. Please mark vent and microphone locations on cured impression for our technicians. A stethoscope tip must be sent with order. If you have questions please call our Technical Services Department at 1-800-525-5071.



Style No. 28B*

Applications

(Thick shell) Allows CIC instrument users to effectively use stethoscopes; the earmold is permanently attached to the stethoscope via a "Ball and Socket" adapter and sits in the ear over the CIC instrument

Available materials

Formula II, Formula II Clear, Superflex, Neon Colors, Vinyl Marble

Modifications

Vent

Options/accessories

Colors, initials

Note: Please take impression with CIC instrument in place. Be sure to cover the vent and microphone openings with tape to prevent impression material from entering these openings. Please mark vent and microphone locations on cured impression for our technicians. Stethoscope must be sent with order. If you have questions please call our Technical Services Department at 1-800-525-5071.



Style No. 32

Applications

(Skeleton) Communications, teleprompter, law enforcement

Available materials

Acrylic, Acrylic with Flex Canal, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Modifications

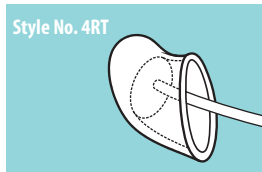
Large bore, vent

Options/accessories

Straight tubing, collar clips, initials, colors. Available as shell 32-6, half-shell 32-8, canal lock 32-5, canal 32-4

Hearing Protection and Recreational Earmolds

Custom-fit earmolds for communication or hearing protection provide an effective, comfortable and repeatable fit. Users can take advantage of custom-fit earmolds for a variety of applications, whether it's swimming, listening to music, shooting, or motor sports. Tests conducted by the United States Air Force Research Laboratory suggest that participants who wear custom-fit hearing protection experience a greater consistency of fit and attenuation than those using generic over-the-counter products.



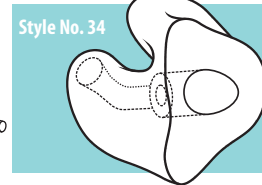
Style No. 4RT
Description
 (Canal) A hollow attenuator with removal filament

Attenuation
 Not rated

Applications
 Designed primarily for motorcyclists to wear under a helmet to help eliminate wind noise

Available materials
 Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Options/accessories
 Colors, initials



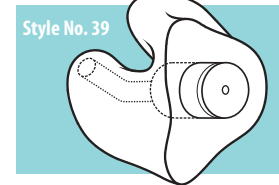
Style No. 34
Description
 (Thick shell) A custom-fit earmold designed for ER4™ headphones

Attenuation
 Not rated

Applications
 For use with Etymotic Research™ ER4 series headphone

Available materials
 Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes

Options/accessories
 Colors, sound bore, Headroom Bore; designed in conjunction with Headroom Amplifiers



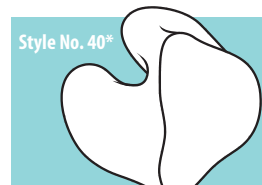
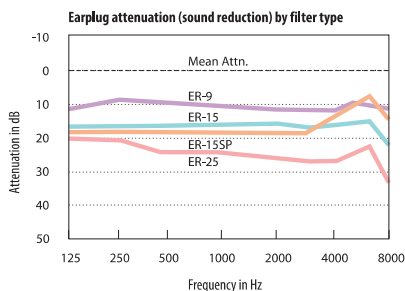
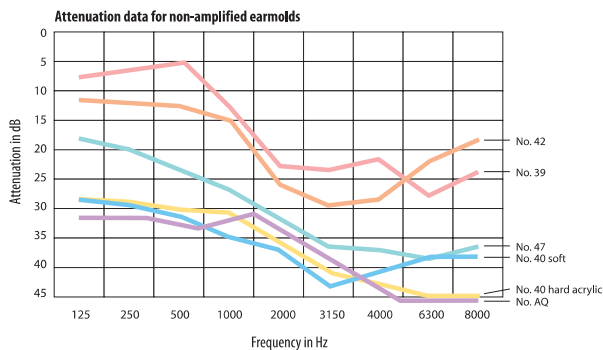
Style No. 39
Description
 (Thick shell) A custom earmold for the North® Sonic Valve

Attenuation
 NRR 6 dB (valve open)

Applications
 For shooting and other high-level impact noise

Available materials
 Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble

Options/accessories
 Cords, colors, initials



Style No. 40*
Description
 (Thick shell) Solid full-thickness, maximum in-the-ear protection/attenuation

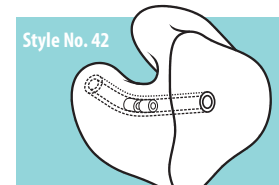
Attenuation
 NRR 24-27 dB, average 36 dB

Applications
 Shooting enthusiasts, heavy equipment operators, construction workers, etc.

Available materials
 Acrylic, Acrylic DisappEar, Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes, AquaNot

Options/accessories
 Colors, DesignEars, glitter, eyelets, cords, removal handles, initials. Available as shell 40-6, half-shell 40-8, canal 40-4 (sleep plug)

Note: If removal handles are desired on Style No. 40, they must be requested on the order form.



Style No. 42
Description
 (Thick shell) Full-thickness filtered attenuator with two Knowles® 680 ohm filters

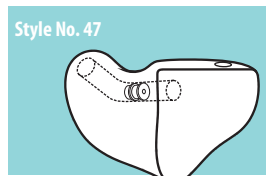
Attenuation
 NRR 10 dB, average 20 dB

Applications
 Low-level noise exposure

Available materials
 Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes, AquaNot

Options/accessories
 Colors, DesignEars, glitter, eyelets, cords, handles, initials, Available as shell 42-6, half-shell 42-8 or canal 42-4

Note: Second-bend, open-mouth, bite-block impressions are recommended for all hearing protection devices.



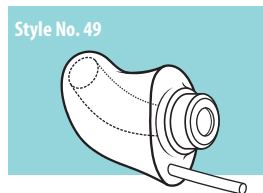
Description
(Thick half shell) Filtered attenuator allows basic verbal communication while lowering overall sound levels

Attenuation
NRR 18 dB, average 30 dB

Applications
Heavy equipment operators, motor sports enthusiasts, construction workers, dental hygienists, shooting enthusiasts, etc.

Available materials
Formula II, Formula II Clear, Rx, Superflex, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, W-1, W-1 DisappEar, OtoBlast, OtoBlast DisappEar, Cat Eyes, AquaNot

Options/accessories
Colors, DesignEars, glitter, initials, cords, handles, Available as full 47-40, shell 47-6 or canal 47-4



Description
(Canal) Earmold provides true high fidelity attenuation using Etymotic Research's ER-9, ER-15 or ER-25 filters

Attenuation
9 dB ER-9 filter, 15 dB ER-15 filter, 25 dB ER-25 filter, +25 dB plugged adapter

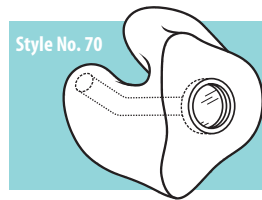
Applications
Musicians, concert attendees, music teachers, DJs, flight attendants, bartenders, waitresses, dentists and dental workers. The best choice for anyone who needs to hear accurately in high noise environments

Available materials
Formula II, Formula II Clear, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, OtoBlast, OtoBlast DisappEar, Cat Eyes

Options/accessories
ER-9, ER-15, ER-25, and ER-15 SP sport filters (orange) and plugged adapters. Filter colors available: clear, beige, brown, red, and blue. Adapter for ER6 Isolator™ and ER6i Isolator™ headphones

Note: Impression must go beyond the second bend for proper acoustic seal and bite-block impression technique recommended.

Countersunk filter option available in Mediflex, Frosted Flex or Oto-Blast earmold materials only.



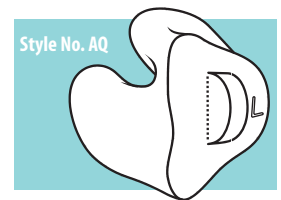
Description
(Thick shell) Swim plug with a sealed membrane spanning sound bore, designed to keep cold water and cold air out of the ear canal, allows basic conversation while in the ear

Attenuation
Minimal

Applications
Swimming, surfing, skiing, biking, jogging

Available materials
AquaNot/Swyr1

Options/accessories
White, black, red, blue, yellow, green, forest green, orange, purple, pink, gray, beige, brown solid colors, Swyr1 (up to three mixed colors), cords, bollo cord



Description
(Thick shell) Swim plug, unsurpassed for comfort and seal; supplied with left and right side identification and finger grips, available in twelve bright colors

Attenuation
NRR 27 dB, average 39 dB

Applications
For use while surface swimming or showering to prevent moisture from entering the ear canal; also a superb sound attenuator

Available materials
AquaNot/Swyr1

Options/accessories
White, black, red, blue, yellow, green, forest green, orange, purple, pink, gray, beige, brown solid colors, Swyr1 (up to three mixed colors), cords

Note: Swim molds of any nature should not be used while scuba diving or while breath-hold diving below six feet.



Earplugs and Deep Water are a Disharmonious Union!

Oddly enough, more scuba divers are certified each year here in Colorado than in 47 other states. We are a land-locked state, and most of our water is in the form of cold, white fluffy stuff we call snow! Wherever a diver chooses to engage in this sport, please remember that earplugs are not to be used for diving.

When an earplug is seated in the ear, there is approximately 2 cc of air between the end of the earmold and the eardrum. This air is subject to changes in volume and density as the diver changes depths. When a diver descends to a depth of 33 feet, both the pressure and the density of air will double. For this to happen, the volume must decrease by half. This holds true for the air in the scuba tank and the air in the ear canal.

With the volume of air reduced by one half within the same physical space, something has to give. The earmold is prevented from moving further down the ear canal because of its shape, therefore the only way to equalize the pressure differential is to distend or breach the TM...not a pretty picture.

There are no "safe depth limit guidelines" for snorkeling or scuba diving for the individual with a perforated eardrum.

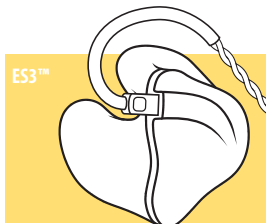
Products for the Musician

Westone has been at the forefront of in-ear musicians' monitor technology since the early 1990s, developing both custom and universal-fit products. With hearing healthcare and music specialists on our research and production teams, Westone is uniquely qualified to provide the best performing, best fitting, highest quality products.

Custom-Fit Musicians' Products



The Elite Series® by Westone has become the top choice of professional musicians for the best possible live performances. Our premium in-ear musicians' monitor combines the latest technological advancements with five decades of experience in crafting custom-fit products for the human ear. The result is a monitor of unequalled sound quality, response and reliability, with the fit and comfort that only custom-molded earpieces can provide.

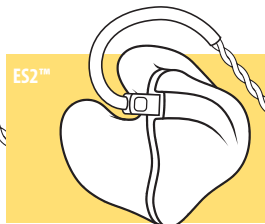


Description
The ES3 is the world's first true three-way, custom in-ear musicians' monitor. A built-in bump in the midrange frequency response especially benefits performing guitarists and vocalists. Providing over 25 dB of ambient noise reduction, the ES3 provides sparkling highs, clear mids and tight low-end response.

Specifications
Sensitivity: 124 dB/mW
Frequency response: 20 Hz -18 kHz
Impedance: 25 ohms
Driver: Three balanced armature drivers with passive three-way crossover

Features
Replaceable cable, one year parts and labor warranty on internal components, user manual and deluxe carrying case

Options
Available in standard, opaque or neon colors. Custom Art Shop is available for an additional charge



Description
Custom made to provide a precise, comfortable fit, the dual driver Westone ES2 provides exceptional low-frequency response, smooth mids and articulate highs, and provides over 25 dB of ambient noise reduction. Our most popular and versatile custom monitor, the ES2 is designed for the most discriminating artists.

Specifications
Sensitivity: 119 dB/mW
Frequency response: 20 Hz -18 kHz
Impedance: 27 ohms
Driver: Dual balanced armature drivers with passive crossover

Features
Replaceable cable, one year parts and labor warranty on internal components, user manual and deluxe carrying case

Options
Available in standard, opaque or neon colors. Custom Art Shop is available for an additional charge

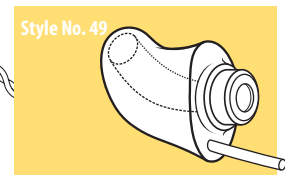


Description
Built to the same exacting standards as the Westone ES2, the single-driver Westone ES1 offers Westone performance and sound at a lower price. Custom made to fit the ear, the Westone ES1 provides over 25 dB of ambient noise reduction and offers astonishing sound quality.

Specifications
Sensitivity: 114 dB/mW
Frequency response: 40 Hz -16 kHz
Impedance: 25 ohms
Driver: Balanced armature

Features
Replaceable cable, one year parts and labor warranty on internal components, user manual and deluxe carrying case

Options
Available in standard, opaque or neon colors. Custom Art Shop is available for an additional charge



Description
The ES49 is the earplug of choice for the discriminating performing musician or concert goer. The flat attenuation characteristics allow the wearer to hear music accurately but at a safer volume. The ES49 is a canal-style earplug that is virtually unnoticeable. With a choice of either 9, 15, or 25 dB filters, the ES49 is perfect for any musician or music lover.

Features
Carrying pouch, removal filament, and one set of ER filters

Available materials
Formula II, Formula II Clear, Neon Colors, Vinyl Marble, Mediflex, Frosted Flex, OtoBlast, OtoBlast DisappEar, Cat Eyes

Options/accessories
ER-9, ER-15, ER-25, and ER-15 SP sport filters (orange) and plugged adapters. Filter colors available: clear, beige, brown, red, and blue. Adapter for ER6 Isolator™ and ER6i Isolator™ headphones

Note: Second-bend, open-mouth, bite-block impressions are recommended for all musicians' products.

Universal-Fit Musicians' Products



The Westone Universal Series in-ear musicians' monitors are made possible by five decades of experience manufacturing products for the human ear. The result—a universal fit, in-ear musicians' monitor of unequalled response, fit and reliability at a price that virtually anyone can afford.



"I can hear every member of my band, my piano, and my vocal without any difficulties. The sound is warm and full especially with the dual drivers. After playing a 2 hour show on tour, my ears never feel tired."
Michael W. Smith



"Because mine are the soft inner pieces with the hard outer visible part, I do not get that moment of massive stage volume whenever I turn my head to the side. Thank you for helping to make my job easier."
Chester Thompson, Phil Collins

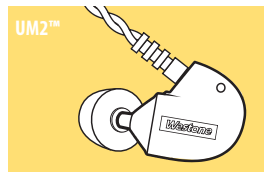
"Being a sax player in mostly electric band situations, hearing is almost always a problem. Now I can hear every note I play at all times. I love it, thank you Westone."
Michael Lington

"Westone is the only company that makes a true triple driver which boosts the midrange frequencies that singers need most."
Tommy Shane Steiner

"I was a convert the first time I used my Westone monitors. I was impressed most with the tight, full, round bass response. How can a sound so BIG come out of something so small?"
Nick Hoffman, Kenny Chesney

"After using different makes and models of in-ear monitors for over eight years now, my new Westone ES2s are not only the best sounding, but the best looking."
Charlie Lowell, Jars of Clay

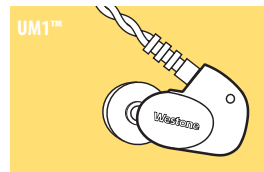
"After 30 years of high energy rock and roll touring, I have finally found the monitor sound I've been searching for... My musicians' monitors have certainly made my job a lot easier."
Max Weinberg, Bruce Springsteen



Description
 Built to the highest professional standards, the dual balanced armature driver UM2 provides amazing low frequency response and rich, articulate mids and highs. Using the same technology as our custom ES2, the UM2 is the earpiece of choice for performers desiring high-end Westone sound quality at an affordable price. The comfortable Comply™ foam tips allow for extended use without fatigue. Provides up to 25 dB of ambient noise reduction. Equipped with a durable 50" stereo "Y" cord and a 3.5mm stereo jack, the UM2 is the perfect choice for on-stage performing or for personal listening.

Specifications
 Sensitivity: 119 dB/mW
 Frequency response: 20 Hz -18 kHz
 Impedance: 27 ohms
 Driver: Dual balanced armature drivers with a passive crossover

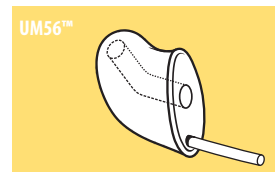
Features
 Soft padded pouch, replaceable Comply foam tips, and wax loop for cleaning



Description
 Built to the same exacting standards as the UM2, the UM1 is a single balanced armature driver universal-fit musicians' monitor offering excellent sound at an entry level price. With comfortable Comply tips, the UM1 provides hours of fatigue free listening with up to 25 dB of ambient noise reduction. The UM1 is the perfect entry level earpiece for performing and personal listening. Equipped with a durable 50" stereo "Y" cord and a 3.5 mm stereo jack, the UM1 is also perfect for personal audio devices such as MP3s, CD players, and laptop computers.

Specifications
 Sensitivity: 114 dB/mW
 Frequency response: 40 Hz -16 kHz
 Impedance: 25 ohms
 Driver: Balanced armature

Features
 Soft padded pouch, replaceable Comply foam tips, and wax loop for cleaning



Description
 While universal-fit eartips can provide a good fit for just about anyone, you can improve the fit of your monitors with a pair of Westone No. 56 canal-style custom earpieces. The Westone Style No. 56 is comparable in size to the tips provided with most universal-fit musicians' monitors, but ensures the comfort and seal that only a custom-fit product can provide.

Features
 Pocket-sized storage pouch, removal filament

Available materials
 Formula II, Formula II Clear, Neon Colors, Vinyl Marble



Westone, SiliClone, ACCES, OtoBlast, BLEND, Elite Series, Silicone Singles, Silicast, and Oto-Ease are registered trademarks of Westone Laboratories, Inc. Plantronics and StarSet are registered trademarks of Plantronics, Inc. Telex is a registered trademark of Telex Communications, Inc. iPod is a registered trademark of Apple Computer, Inc. Knowles is a registered trademark of Knowles Electronics. Comply is a trademark of Hearing Components. North is a registered trademark of North Safety Products. ReSound is a registered trademark of GN ReSound A/S Co. Etymotic Research, ER6 Isolator, ER6i Isolator, ER4 are trademarks of Etymotic Research, Inc.