



AeroStone[®] Guidelines

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The finest aircraft countertops in the world are manufactured with **AeroStone!** Our tops are the finest because of the wide range of beautiful designs, finishes and colors, their exceptionally low weight per square foot, the lack of any significant post-molding warpage, the ability to form integral seamless features such as splashes and sinks, and of course the guarantee of full compliance with FAA flammability regulations.

The following Guidelines were created to give aircraft interior designers, engineers, manufacturers and quality control personnel the information they need to best utilize **AeroStone** in their projects. As we continue to evolve and improve the product, we will update this information. If you would like to be on our update list, please contact us at the phone number or address shown below.

Thank you for your cooperation and interest in **AeroStone!**

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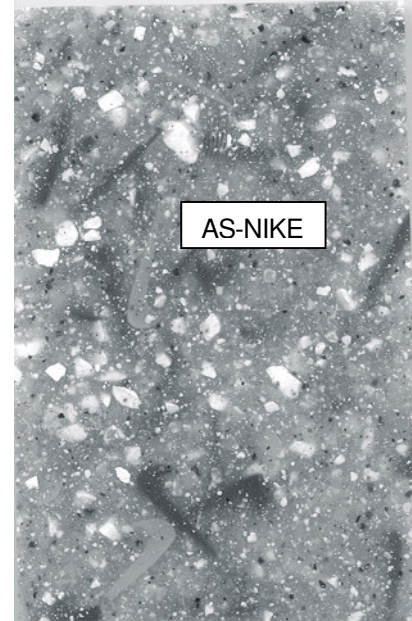
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DESIGNER GUIDELINES

➤ *Stone Styles*

Simulated Granite

AeroStone is available in a wide variety of standard granite patterns. Custom color matching service is available. These patterns are capable of molding with a wide variety of integral seamless splashes, noses and sinks.



Simulated Marble

The simulated marble patterns are generally all custom developed forms of **AeroStone**. These patterns are capable of molding with some styles of integral seamless sinks, noses and splashes.

Solid Color

The color runs throughout the material surface, not just a coating like faux products. Custom color matching service is available.

In addition to this range of **AeroStone** designs, we offer a new type of material: **SOLID SURFACE AEROSTONE** – with the total color depth of conventional residential solid surface counters. This provides the high durability of solid surface, but with the advantages of FAA flammability certification and significantly lighter weight (1/8” surface thickness). Custom colors and matching sink bowls are available on request. We sell sheet and bar forms, as well as finished tops which include a clear high-gloss top-coat option. Contact us for additional details.

➤ *Finish*

Standard finish is matte for galley and galley annex countertops, and high gloss for lavatory countertops. Note: The matte finish provides greatest ease of maintenance – tends to hide minor scratches in high use areas.

➤ *Splashes*

Splashes are raised areas on the top designed to keep water and cleaning fluids from running over the edge of the top. Liquids which get down into the cabinetry can cause corrosion of metals and/or disintegration of wood. For maximum effectiveness, splashes should be around the entire perimeter of the top. The **AeroStone** process allows us to mold splashes integrally with the top.

There are two standard splash styles, short and tall. The short style splash is ¼ inch (6 mm) higher than the main countertop, and the tall style is 1 inch (25 mm) higher. We can also mold custom splashes up to 4 inches (100 mm) tall in granite patterns. For marble patterns, tall splashes can be molded as separate panels and joined to the short landing.

When upper cabinets or other fixtures are to be mounted on the countertop, we recommend the standard short splash be extended 1 inch (25 mm) under the cabinet. This ensures that any style of cabinet door will not interfere with the raised portion of the nose (see below). We call this kind of splash a “landing”.

The standard AeroQuest splashes are detailed in an attached drawing. Custom splashes are available upon request.

➤ *Nose*

The nose is an integrally molded trim that runs along the finished edge of the top (typically in-board). It usually has a portion raised about 1/8 inch (3 mm) above the countertop to function like a short splash, and a portion which covers the front edge of the substrate and the joint with the lower cabinet. The nose is shorter than the landing so that it will never interfere with cabinet doors. The current AeroQuest standard nose profiles are shown in an attached drawing. Custom nose shapes are also available but may require additional tooling charges.

➤ *Sink and Sink Cover*

We can mold a sink that is integral with the countertop, or create a hole for an undermount sink. We have a variety of standard integral sink styles available (see attachment), or can fabricate to your custom requirements. For drop-in sinks, the shop usually cuts the proper hole after the top is delivered. Please specify sink and mounting style when ordering. Sink covers are usually supplied with all undermount galley sinks at no extra charge ... just specify the finger hole size and location.

➤ *Other Features*

We have produced other related features using **AeroStone**. These include pivoting trash doors, soap dishes and décor panels. Our molding technology is very flexible to satisfy your needs.

➤ *Design Do's & Don'ts*

With our CNC router and digitizer capability, we can match any two-dimensional substrate shape. We encourage manufacturers to work with us to take advantage of this capability. We can also use CAD drawings sent to us by email or FTP to directly produce the top substrates and molds at our facility, thus saving time and money.

Don't design countertops that have narrow sections that are prone to excessive twisting in handling or flight. This could cause the **AeroStone** to break.

Do limit the number of design options as much as is feasible to save time, minimize confusion, and maximize efficiency of production. For example, if one standard model of sink can be chosen for all galley designs, then the entire quotation and production process becomes much simpler and more likely to be error-free.

Do tell us if you need a design different from our standard colors. We take pride in being able to develop custom patterns of granites and marbles based on designer inputs.

➤ *Samples*

AeroQuest is happy to supply samples of our most popular **AeroStone** styles to all prospective customers in standard 2" by 2" (50 x 50 mm) squares for granite designs and 6" by 6" (150 mm x 150 mm) for marble patterns. Current customers will receive periodic line updates. We will always provide control samples for approval of new, custom designs prior to manufacture.

ENGINEERING GUIDELINES

➤ *Dimensions*

We ask our customers to fill out an “**AeroStone** Countertop Checklist” for each item ordered. This Checklist covers most of the details we need to know in order to produce a countertop that will meet your needs. Your help in including a completed Checklist with each substrate will reduce the amount of communication required to start the job.

Although there is a great deal that can be customized in our tops, there are certain dimensions and design elements that must be followed to ensure that the top is durable and feasible to manufacture:

1. The simulated stone layer is typically 3/16 inch (5 mm) thick to allow for good impact strength while minimizing weight and allowing enough depth for large embedded granules. 1/8 inch (3 mm) thick designs have also been developed for further weight savings.
2. Internal corners should have a minimum radius of ¼ inch (6 mm) to avoid stress risers and cracking in shipping and use.
3. External corners should have a minimum 1/16 inch (2 mm) radius to avoid chipping on impact.
4. To avoid cracking in handling and use, do not incorporate cut-throughs, such as for bulkheads or cabinet partitions.
5. General manufacturing tolerances are ±0.13 inch (±3 mm) overall and +0.06/-0.03 inch (+1,6/-0,8 mm) on thickness and nosing cross section unless otherwise specified.
6. Allow a minimum of 1.5 inch (38 mm) from the sink rim to the nearest edge.
7. Avoid thin “arms” or “wings” – that is, countertop designs which have narrow sections that are prone to excessive twisting in handling or flight. **AeroStone** is somewhat flexible, but relies on the structural rigidity of the honeycomb substrate and subtop to prevent flexing which could cause material failure.

There are other standard features that we recommend be used for overall practicality:

1. Use noses with raised top edges, short or tall splashes around the perimeter of the top, and landing splashes under upper cabinets to prevent water and cleaning fluids from running down behind cabinetry and causing deterioration and corrosion (refer to attached drawing for standard dimensions).
2. Maximum height for integral tall splashes (backsplashes) is 4 inches (100 mm) for granite designs and 1 inch (25 mm) for marble designs.

➤ *Drawings*

We request a copy of all drawings pertaining to the top (side, front and top views) and the floor plan for the aircraft whenever possible as a double-check reference.

➤ *Honeycomb Substrates*

Typically the aircraft manufacturer provides a honeycomb substrate cut to exactly fit the supporting cabinetry, allowing for the **AeroStone** material to wrap over the exposed honeycomb edges and cover the seam between the honeycomb and the cabinet. We request that ½ inch (13 mm) Nomex™ core honeycomb with two-ply epoxy fiberglass skin (or equivalent) be used for substrates. Please contact us before sending any other type of honeycomb for substrate use.

The location of the upper cabinet is indicated by a scribe line on the substrate. This line is made by the shop with the substrate and upper cabinet positioned as they will be installed. If a separate undermount sink is specified, supply the substrate with the sink hole cut to the finish size desired or mark the finish size in the desired location. For separate drop-in sinks, the shop usually cuts the proper hole in the finished top just prior to installation. For an integral sink, mark the finish size in the desired location and, for non-standard drains, specify the style of drain to be used, or provide the drain with the substrate. Sinks located near the end of a long top can shift from 1/16 to ¼ inch (1,6 to 6,4 mm) toward the center of the top; make sure this does not cause interference with undermount structures.

Sink covers are usually constructed using ½ inch (13 mm) honeycomb; see Standard Splash & Sink Cover drawing at the end for details. Covers are typically made with the same construction as the top, with **AeroStone** covering the entire top and side edges of the honeycomb core. Aircraft manufacturers typically then fabricate and attach a 1/32 inch (0.8 mm) thick sheet of laminate to cover the entire bottom, plus a ⅛ inch (3 mm) to ¼ inch (6 mm) thick nylon or Teflon sheet on top of that cut to fit the inside of the undermount sink. This forms a cutting board or work surface.

Manufacturers install threaded or passthrough inserts in substrates as required to mount the countertop to the cabinets. We recommend that manufacturers install these inserts after the top is produced; this makes it easy for the countertop assembly to be precisely aligned with the cabinet.

➤ *Composition*

AeroStone is composed of a proprietary blend of polyester resins, inert fillers, catalyst MEKP, flame retardants and pigments.

➤ *Safety*

The **AeroStone** product line passes FAR 25.853a, Appendix F, 60 second vertical burn test. We have recently developed a new solid surface material called “SP-6565” which meets the more stringent FAA/JAA requirements for commercial aviation (heat release, toxic gas, and smoke density). Contact the main office for more details on SP-6565.

PURCHASING GUIDELINES

➤ *Estimates*

To obtain a cost and delivery estimate for a non-standard **AeroStone** part, please send drawings and a completed Countertop Checklist to provide us as much information as possible about the size, shape, color, finish, etc. If a custom color match is needed, send a sample which shows the colors to match. There is no charge for the first color match attempt; if the color is difficult to match, additional charges may apply.

➤ *Order Information*

In addition to the usual purchase order information, please include the desired color for each top (e.g. AS-915). If your company has assigned a part number to the top, please include that on the P.O. Standard terms are 50% down, 50% net 30. Items are shipped FOB Lawrenceville, Georgia, and any damage sustained in transit due to shipper negligence is the responsibility of the customer to remedy. We will use your standard shipper, account number and speed of delivery unless otherwise specified.

➤ *Pricing*

Due to the great variation in complexity of countertop designs, we usually quote pricing after we know the full details about a job. We welcome requests for volume discounts based on quantity orders. Pricing includes tooling and custom packaging, and is based on customer-supplied honeycomb.

➤ *Burn Samples and Certificates*

If the customer orders a burn sample set for a custom top or ship set of tops, we will supply three pieces of **AeroStone**, 3 by 12 inches (76 by 305 mm), the same thickness as the main countertop area, mounted on honeycomb panel using the same construction as the top(s). If the customer is supplying honeycomb substrates for the countertops, they also supply sufficient panel for the 3 formal burn samples plus 3 internal burn samples. AeroQuest can obtain an 8110-3 burn certificate from an independent, certified lab at an additional charge.

➤ *Packaging*

The standard method of packaging for large parts is to construct a custom crate using 3/4" plywood walls and 3/8" plywood or particle board tops and bottoms with crossbar supports and legs as necessary. The part is protected using a foam-in-place system with protective sheeting or commercial packing for smaller parts. The crate cover is secured with screws.

SHOP GUIDELINES

Typical Countertop Fabrication Process:

1. Shop cuts and edge-fills a honeycomb substrate to match the lower cabinet dimensions. The substrate is usually made from ½ inch (13 mm) Nomex core, 2-ply epoxy-fiberglass skin honeycomb (ATR-FP-501-F2 or equivalent). Make sure all internal corners have a minimum radius of 0.25 inch (6 mm). Follow standard honeycomb structural construction procedures. Sink openings that are cut to finish size do not need to be edge-filled as AeroQuest will cut back to allow for the AeroStone wrap.
2. Shop marks the top of the substrate with the cabinet type, aircraft serial number, finish size and location of sink and other holes, locations for nose and/or splash, and upper cabinet tracing. See Substrate Marking Example in the Standard Features page on our website. *Note:* Shop can cut finished size holes instead of marking sink and other hole size and locations.
3. Shop cuts & marks honeycomb as needed for burn samples, sink covers, etc.
4. AeroQuest produces a mold based on the substrate.
5. AeroQuest casts **AeroStone** simulated granite or marble to match the substrate and permanently bonds them together. The top is trimmed, usually allowing a small overhang on the edges so the installer can do final trim to fit. Then the top is final finished and packed in a custom crate.
6. Shop trims top to fit adjacent walls and cabinetry -- use a sharp ½ inch (13 mm) carbide tool at 16-18,000 rpm, 75 fpm (40 cm/sec) feed rate, cut into the material, and leave minimum ¼ inch (6 mm) radius on internal corners.
7. Shop attaches thin laminate to cover bottom of sink cover, then attaches cutting board onto laminate to fit sink opening.
8. Shop installs inserts in substrate, then does final installation on the cabinet. To install inserts, first align the countertop with the subtop in final position. Double check that the entire subtop surface is flat and has no irregularities. The bottom of the substrate should be fully supported and in close contact with the entire subtop. Mark the locations of all inserts to be installed in the substrate. Install closed end inserts in each location using clear epoxy (black epoxy may show through on light colored AeroStone styles). During final install, be sure to use proper length screws that do not push the insert up into the **AeroStone**; this can cause localized stress which could lead to cracking.

USER GUIDELINES

The beauty of **AeroStone** countertops is more than skin deep. Their rugged aerospace-style composite construction makes them extremely durable and easy to care for compared to natural mineral tops.

➤ *To Clean*

- ◆ Wipe the surface with a damp cloth; you may use soapy water or ammonia based cleaner (such as a glass cleaner) if you wish. Do not use abrasive pads or cleaners which could scratch the top.

➤ *To Disinfect*

- ◆ Wipe the surface with a 50/50 solution of water and household bleach.

➤ *To Prevent Damage*

- ◆ While **AeroStone** is highly impact resistant, no material is completely impact proof. Do not strike the surface with heavy or pointed objects.
- ◆ As a thermoset matrix, **AeroStone** will tolerate a wide variation in temperatures and thermal shock. However, do not put materials colder than ice (such as dry ice) or hotter than boiling water (such as microwaved trays) directly on the countertop surface.
- ◆ To preserve the uniform finish of the top, avoid using the surface as a cutting board. The underside of the galley sink cover is typically covered with a cut resistant material for this purpose, or a separate cutting board may be provided.

➤ *To Repair Scratches*

To remove scratches on matte / satin finishes: sand scratches with 320-grit sandpaper until they no longer are visible. Restore finish by first sanding with 600-grit sandpaper, then with an abrasive cleanser and a green Scotch-Brite pad. For high polish gloss finish surfaces, follow the same procedure; then wet sand with 1200-grit sandpaper and buff with a wool pad and buffing compound to restore the gloss finish.

➤ *Stain and Chemical Resistance*

AeroStone is highly resistant to a wide range of aggressive chemicals which would attack common commercial solid surface tops and laminates. No lasting effects were noted on **AeroStone** after exposure to the following:

- ◆ Acids: acetic, citric, hydrochloric, phosphoric, sulfuric
- ◆ Solvents: acetone, carbon tetrachloride, ethanol, methanol, naphtha, toluene
- ◆ Alkalines: ammonium hydroxide, hydrogen peroxide, sodium hydrochloride, sodium hydroxide
- ◆ Other: ammonia, blood, coffee, lipstick, lye, nail polish remover, vinegar, wine

AeroStone is extremely stain resistant and should resist all common staining agents; even permanent ink can be removed with acetone or nail polish remover without damaging the top.

➤ *Temperature Resistance*

AeroStone will withstand thermal shocks ranging from 0°F (-18°C) to 212°F (100°C) without cracking or other damage. Since **AeroStone** is made from a thermoset resin matrix, it will never melt or distort and can sustain short exposure to high temperatures without damage.

CAUTION: Do not put dry ice or metal containers with dry ice or items heated beyond 212°F directly on the **AeroStone**.

With proper care, your **AeroStone** countertops should provide many years of beautiful performance in your aircraft!

WARRANTY

We have a great deal of pride in the quality of all of our products, and continue to improve our methods and materials year after year. AeroQuest warrants all **AeroStone** products against all defects in materials or workmanship, including warping or cracking, for a period of five years from date of shipment. This warranty is contingent on following the design, handling and usage specifications in this Guide. Please address any concerns about **AeroStone** directly to the attention of your Account Manager or the General Manager.