2023 v4

CertiPUR-US® Technical Guidelines for Slabstock Foam

Physical Property and Environmental Criteria for Certification of Slabstock Flexible Polyurethane Foam for Use in Furniture and Bedding

Includes Requirements for New Biobased Foam Family

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CertiPUR-US® is a program of the nonprofit Alliance for Flexible Polyurethane Foam, Inc.

www.certipur.us

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About the CertiPUR-US® Program

Administered by a nonprofit organization, the CertiPUR-US® program was established in 2008 as a testing, analysis and certification program for slabstock and molded flexible polyurethane foam, including memory foam. Our certification is specific to foam cushioning material in home furnishings such as adult mattresses, crib mattresses, mattress toppers, pillows, pet beds, upholstered furniture (such as sofas and accent chairs) and some accessory comfort products.

Since the program's beginning, the number of participating foam producers has grown to nearly 100 worldwide, encompassing much of the foam supplied to the U.S. bedding and upholstered furniture markets. In establishing global standards and requiring participating foams to meet or exceed U.S. federal, state or local requirements, the program gives consumers confidence in knowing what is — and isn't — in the home furnishings they purchase that contain polyurethene foam, whether that foam is manufactured in the U.S. or imported from abroad.

Certified foams are:

- ✓ Made without formaldehyde
- ✓ Made without ozone depleters
- ✓ Made without phthalates regulated by the U.S. Consumer Product Safety Commission
- ✓ Made without mercury, lead and other heavy metals
- ✓ Low VOC (volatile organic compound) emissions for indoor air quality (less than 0.5 parts per million)
- ✓ Screened for relevant chemicals, including flame retardants, that are classified as carcinogens, mutagens or reproductive toxins and are harmful to human health

To become CertiPUR-US® certified, foam samples are taken at the manufacturing stage and sent to one of four approved independent, accredited testing laboratories to be analyzed for content and emissions.

Samples are screened for relevant chemicals (chemicals that could potentially be used in the manufacture of flexible polyurethane foam) that are classified as carcinogenic (may cause cancer), mutagenic (may cause genetic defects) or reprotoxic (may damage fertility or an unborn child) by the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). GHS is an internationally agreed-upon standard managed by the United Nations that was set up to replace the assortment of hazardous material classification and labeling systems previously used around the world.

Additional testing of foam samples is done to detect the presence of lead, mercury and other heavy metals. Certified foams meet the Consumer Product Safety Commission toy standard for lead.

Certified foams are subject to random verification testing. CertiPUR-US® program representatives make virtual and on-site visits to participating foam production plants to obtain samples of certified foam, which are then tested at the program's expense to confirm compliance.

It is our policy to be transparent. Everything about the program is readily available on our website at **www.certipur.us**. We continually evaluate information from the science community, government and regulatory agencies and update our criteria for certification as good science and regulatory concern warrant. The complete criteria for certification of flexible polyurethane foam, including laboratory testing methodology and protocols, are outlined in the following pages and downloadable at **certipur.us/technicalguidelines.**

Additional Resources

- Directory of participating companies and brands: **certipur.us/directory**
- Participating foam producers by name and country: **certipur.us/producers**
- Website: **www.certipur.us**

Overview of Steps in Certifying a Foam

The certification process generally takes 2 to 3 months from start to completion, including the laboratory emissions and analytical testing which takes about 1 month.

1. Notify CertiPUR-US® of your company's interest in certifying a foam. We will send you an introductory email along with preliminary screening questions that will determine whether your company's foam production meets basic qualifications to certify a foam.
2. Review the **Technical Guidelines** at certipur.us/technicalguidelines carefully to determine whether your foam is likely to meet the criteria for certification based on your current formulation — or re-formulate as needed.
3. Determine which foam family/families your company intends to certify (see Section 1 of **Technical Guidelines**).
4. Select which of the approved laboratories you will use and contact them regarding costs and procedures. The analytical testing is paid directly to the lab of your choice and is not included in CertiPUR-US® registration or renewal fees. Follow the foam family sampling procedures outlined in Section 9 and submit 3 foam samples using the **Sample Submittal and Analytical Request** form. We recommend sending a foam sample to one of the approved labs before beginning the application process to assess the likelihood of meeting the certification before application fees are incurred. Once you are sure you want to test for registration, begin by cutting a block of your chosen foam and taking the photo required (see Sections 9 and 10) since this production block will be the source from which samples are taken to be tested.
5. Conduct the physical property testing of the foam to be certified. This can be done by your internal lab or by any accredited lab that can perform the ASTM testing required. Details about the physical property test are described in Sections 7 and 8. The results must be recorded on the **Physical Property Testing Report** form (see Forms section or download at certipur.us/producerforms).
6. Submit an **Application/Renewa**l form online or download at certipur.us/producerforms
7. To complete your application, submit the following documents:
   - ☐ **Application/Renewal** form (be sure to initial and sign as indicated)
   - ☐ Photo of production foam block for all test samples (see Section 10)
   - ☐ **Laboratory Report on Emissions and Analysis of Content** (provided by your chosen laboratory)
   - ☐ **Physical Property Testing Report** (see Forms section — for biobased foam, choose appropriate form)
   - ☐ Take the 20-minute online **Certificate of Knowledge** course at certipur.us/certificatecourse. You will need the 16-digit number that appears on your certificate of course completion to complete the **Terms of Use Agreement (Form B)**.
   - ☐ Sign and submit the **Terms of Use Agreement (Form B)** at certipur.us/FormB
8. If your completed application is approved, you will receive an invoice that must be paid before final certification is granted.
9. Once payment is received, CertiPUR-US® will send an email to welcome you to the program with a request for the following information needed to create an individual page for your company on the CertiPUR-US® website. That website page will include:
   - Company name, logo and website
   - Certificate including foam families certified, lab report I.D. and date of renewal
   - Contact information
10. Your company will receive reminder notifications 90 days, 60 days and 30 days before your foam family is due for renewal. Renewals must be completed on a timely basis for the foam family to maintain certification. If your certification lapses, permission to use the CertiPUR-US® name and logo will be rescinded.

Section 1a
Foam Families

The foam producer may certify foam families of equivalent qualified flexible polyurethane foam products (i.e. a number of flexible polyurethane foam products having various physical characteristics but sharing the same raw materials). Separate application and registration would be necessary for foam products manufactured from differing raw materials. It is the responsibility of the foam producer to notify raw material suppliers when registration has been achieved so that they can advise the foam producer if raw material formulation changes are anticipated during the duration of the registration period.

Foam producers have the option to add a branded name for any foam family category, including using that branded name as the sole identifier in the "other" foam family category. This enables customers to recognize a branded name as being certified. The branded names may appear in two places on the CertiPUR-US® website: 1) foam producer's individual page and 2) foam producer's certificate.

Slabstock Foam Families:

- **NEW** Biobased foams (see Section 1b below)
- Conventional foams
- Conventional FR foams (sharing the same flame retardant package)
- High resilience foams
- Super-soft (low density/low index) conventional foams –25% IFD ≤15 lbs. (65 N) and density ≤1.5 lbs/ft^3 (24 kg/m^3)
- Viscoelastic (memory) foams
- Viscoelastic (memory) foams with gel
- Branded foams (any of the categories listed above with an exclusive branded name)
- Other foams (subject to approval)

*For molded foams, see separate **Technical Guidelines** for certification of molded foam.*

Section 1b
Certification of Biobased Foam Families

Biobased foams are considered a separate foam family. Currently certified foams may apply for biobased status as a new foam family with basic certification criteria and biobased content analyzed together. Additionally, tensile, tear, elongation and ball rebound property testing is required of biobased foams. Only open cell foam for use in bedding and upholstered furniture will be eligible for certification as a biobased foam.

- **Biobased Content:** The percentage of biobased content in the foam is based on the ASTM D6866-22 Method B standard, which uses an Accelerator Mass Spectrometer (AMS) instrument to measure how much of the carbon within a product is derived from biomass. The result indicates the percentage of the product's biobased carbon versus fossil-derived carbon.
- **Limitations and Conditions:** Foam producers that certify a biobased foam through the CertiPUR-US® program will be granted permission to use a special logo reserved for use with certified biobased foam that identifies the minimum level of biobased content. Use of the 25% biobased foam logo will convey from foam producer to their customers that purchase certified biobased foam and are registered and up-to-date with their directory listings. Those using the new biobased foam logo must also agree to new Terms of Use that establish guidelines on how a CertiPUR-US® biobased foam may be marketed. See **CertiPUR-US® Terms of Use Manual** at certipur.us/termsofuse.
- **Additional Physical Property Testing Requirements:** For certified biobased foam, a separate **Physical Property Testing Report for Biobased Foam** must be submitted. This report requires information about tensile, tear, elongation and ball rebound. See Sections 7 and 8 and the **Physical Property Testing Report for Biobased Foam** in the Forms section.
- **Shipping Samples:** Samples for biobased foam certification will be sent to the CertiPUR-US® approved lab of your choice. Your lab will facilitate chain-of-custody responsibility and will be responsible for shipping a sample to Beta Analytic labs in Miami, Florida, for Carbon-14 analysis to determine the percentage of biobased content in the sample.
- **Number of Samples:** Three samples are required for submission to the approved CertiPUR-US® lab. No additional samples or sizes are required for the biobased content testing.

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- **Recertification:** Consistent with current renewal schedules of certification, once a biobased foam is certified, it must be recertified six months after the initial certification and annually thereafter.
- **Turnaround Time:** Certifying a biobased foam is not expected to delay or take longer than the usual certification process.
- **Fees:** In addition to the CertiPUR-US® registration and renewal fees to certify a foam family, for biobased foams, additional lab costs for the Carbon-14 analysis to determine the percentage of biobased content will apply and should be negotiated directly with your chosen, approved laboratory. See Foam Producer Fees at **certipur.us/fees** for estimated costs.

Section 2
Registration Duration

To demonstrate consistency of formulation and raw material content, each foam family is required to be certified twice in its first year and annually thereafter. A foam certified for the first time in January 2024, for instance, would need to be recertified six months later in July 2024. In January 2025, the foam would be recertified again — moving to an annual recertification schedule every January.

Section 3
Approved Testing and Analysis Laboratories

Enthalpy Analytical
Attn: CertiPUR-US Sample Receiving
2625 Denison Drive, Ste. D
Mount Pleasant, MI 48858 USA
Phone: (country code) +1 989.772.5088
Fax: (country code) +1 989.772.5870
Email: **mtpinfo@enthalpy.com**

Intertek
Attn: VOC Lab/CertiPUR-US Testing
4700 Broadmoor, Ste. 200
Kentwood, MI 49512 USA
Attn: Dr. Jesse Ondersma
Phone: (country code) +1 616.656.7401
Email: **certipur.us@intertek.com**

Eurofins Product Testing A/S
Smedeskovvej 38
DK-8464
Galten, Denmark
Phone: (country code) +45 7022 4276
Fax: (country code) +45 7022 4275
Email: **voc@eurofins.com**

TÜV Rheinland LGA Products GmbH
Tillystraße 2
90431 Nuremberg, Germany
Attn: Dr. Jelena Galinkina
Phone: (country code) +49 911 655 5614
Alt. Phone: (country code) +49 911 655 5604
Fax: (country code) +49 911 655 5604
Email: **jelena.galinkina@de.tuv.com**

Note: For certification of biobased foams, samples must be sent to one of the approved labs listed here. Your chosen lab will facilitate sending a portion of your sample to Beta Analytic in Miami, Florida, for Carbon-14 analysis to determine the percentage of biobased content.

To do a preliminary pretest at your expense to determine likelihood of achieving 25% or more biobased content, contact Beta Analytic directly at **info@betalabservices.com**

Section 4
Foam Producer Declarations

Foam or adhesives processed with CFC or other ozone depleters	No
Foam or adhesives processed with MeCl2 or nPB (dichloromethane or n-propyl bromide)	No
Foam processed with BHT polyol additives	No
Foam processed with any PBDE additives, TDCPP, TCEP, TEPA or TDBPP Tris flame retardants	No

Section 5
Prohibited Substances

Important Change: Effective November 23, 2023, 2-ethyl hexanoic acid (2-EHA CAS: 149-57-5) and most of its salts, including stannous octoate (CAS: 301-10-0), will be added to the list of prohibited substances, and foams submitted for certification that contain 2-EHA will not be certified. For more information: **certipur.us/stannous**

Prohibited Chemicals Based On GHS* (Globally Harmonized System of Classification and Labeling of Chemicals)		
GHS Hazard Class	**Category**	**United States GHS Hazard Statements**
Carcinogen	1A, 1B	May cause cancer
Germ cell mutagen	1A, 1B	May cause genetic defects
Reproductive toxicity	1A, 1B	May damage fertility or the unborn child

*GHS replaced R-Phrases (Based upon European Union Risk Assessments)

Prohibited Blowing Agents
Chlorofluorocarbon (CFC)
Hydrochlorofluorocarbon (HCFC)
Dichloromethane (methylene chloride)

Prohibited Flame Retardant Additives	CAS Number
Antimony (see Section 6)	7440-36-0
Chlorinated or brominated dioxins or furans	Various
Chlorinated hydrocarbons (1,1,2,2-Tetrachloroethane; Pentachloroethane; 1,1,2-Trichloroethane;1,1-Dichloroethylene)	Various
Decabromodiphenyl ether (PBDE) (see Section 6)	1163-19-5
Dimethyl methylphosphonate (DMMP)	756-79-6
Hexabromocyclododecane or HBCD	3194-55-6
Nitrites	Various
Octabromodiphenyl ether (PBDE) (see Section 6)	32536-52-0
Polybrominated Biphenyls (PBB)	59536-65-1
Polychlorinated Terphenyls (PCT)	61788-33-8
Polychlorinated Biphenyls (PCB)	1336-36-3
Pentabromodiphenyl ether (PBDE) (see Section 6)	32534-81-9
Tris (2,3-dibromopropyl) phosphate (TDBPP)	126-72-7
Tris-1-aziridinylphosphine oxide (TEPA)	545-55-1
Tris (2-chloroethyl)-phosphate (TCEP)	115-96-8
Tris (1,3-dichloro-2-propyl) phosphate (TDCPP)	13674-87-8

Other Prohibited Substances	CAS Number
2-ethyl hexanoic acid (2-EHA) (relevant metal salts, e.g. stannous octoate) — prohibited effective November 23, 2023	149-57-5
Chlorinated phenols (PCP, TeCP)	87-86-5
Trimethylphosphate	512-56-1
Hexachlorocyclohexane	58-89-9
Monomethyl-dibromo-diphenylmethane	99688-47-8
Monomethyl-dichloro-diphenylmethane	81161-70-8

Section 6
Independent Laboratory Analysis

Note: See Section 13 for details on Laboratory Testing Methodology and Protocols

Emissions Testing

Substance	CAS Number	Guideline Limit [mg/m^3]
Formaldehyde	50-00-0	<0.1
Benzene	71-43-2	<0.5
Toluene	108-88-3	<0.5
Styrene	100-42-5	<0.3
Vinylcyclohexene	100-40-3	< LOD*
4-Phenylcyclohexene	4994-16-5	< LOD*
Aromatic hydrocarbons		<0.5
TVOC emissions		<0.5[†]
2-ethyl hexanoic acid (2-EHA) (relevant metal salts, e.g. stannous octoate) Prohibited effective November 23, 2023	149-57-5	<0.005

*Limit of Detection

[†] Although the CertiPUR-US® limits for VOC emissions and the results reported by laboratories are in mg/m^3 units, for simplicity in consumer marketing materials, we convert to parts per million (ppm). For the substances reported, the individual values and TVOC limit of <0.5 mg/m^3 are actually lower than 0.5 ppm. Conversion from mg/m^3 to ppm uses the formula *(mg/m^3 x 24.45) / molecular weight = ppm.*

Metals of Concern

Substance	CAS Number	Guideline Limits (ppm)
Antimony (Sb)	7440-36-0	60
Arsenic (As)	7440-38-2	25
Barium (Ba)	7440-39-3	1000
Cadmium (Cd)	7440-43-9	75
Chromium (Cr)	7440-47-3	60
Lead (Pb)	7439-92-1	90
Mercury (Hg)	7439-97-6	60
Selenium (Se)	7782-49-2	500

Tributyltin

Substance	CAS Number	Guideline Limit (ppm)
Tributyltin (TBT)	688-73-3	0.5

Phthalates

Substance	CAS Number	Guideline Limit (ppm)
Sum of 8 Phthalates	See Section 13d	≤ 0.01 wt %

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TDA/MDA

Substance	CAS Number	Guideline Limit (ppm)
2,4 – Toluenediamine (TDA)	95-80-7	≤ 5.0 ppm
4,4′ – Diaminodiphenylmethane (MDA)	101-77-9	≤ 5.0 ppm
Sum of TDA (2,4) plus MDA (4,4′)	95-80-7 + 101-77-9	≤ 5.0 ppm

Polybrominated (PBDE) Flame Retardant Additives

Substance	CAS Number	Guideline Limit (ppm)
Pentabromodiphenyl ether	32534-81-9	≤ 0.01 wt %
Octabromodiphenyl ether	32536-52-0	≤ 0.01 wt %
Decabromodiphenyl ether	1163-19-5	≤ 0.01 wt %

Section 7a
Physical Property Testing

Physical property testing of the foam to be certified (from the same block as the sample sent for laboratory analysis) can be done by a company's internal lab or by any accredited laboratory that can perform the required ASTM testing. The results must be recorded and submitted on the **Physical Property Testing Report** form on page 12. For biobased foams, which are subject to additional testing for tensile, tear, elongation and ball rebound, see Sections 7b and 8 and form on page 13.

Test	Limit	Test Method
1) Average density[1]	Report	ASTM D3574 Test A
2) Average 25% IFD[2] and tolerance	± 3.0 lbs or +/- 10% max[3]	ASTM D3574 Test B_1
3) 25% IFD loss after fatigue test only applies to foams within 25% IFD range[4] of 24 to 36 lbs (100 – 160 N)	Loss < 6 lbs (26.7 N)	ASTM D3574 Test I_3 (Procedure A)[5]
4) 75% compression set HR-type and melamine-filled foams All others (conventional, viscoelastic, etc.)	20.0% max 10.0% max	ASTM D3574 Test D
5) Humid aged 75% compression set HR-type and melamine-filled foams All others (conventional, viscoelastic, etc.)	30.0% max 10.0% max	ASTM D3574 Test D and J[6]

[1] Average density from testing of 15 in x 15 in x 4 in (380 mm x 380 mm x 102 mm) samples prepared as outlined in Section 8.

[2] Average IFD @ 25% from testing of 15 in x 15 in x 4 in (380 mm x 380 mm x 102 mm) samples prepared as outlined in Section 8.

[3] Maximum deviation of ± 10% of the average 25% IFD or of 3.0 lbs. (13.3 N) — whichever is greater — by any single sample from the average 25% IFD.

[4] Based on the average 25% IFD in Test 2) using 15 in x 15 in x 4 in (380 mm x 380 mm x 102 mm) samples. Test 3) does not apply to foams outside this range.

[5] Constant force pounding, 8000 cycles ASTM D3574 Test I_3 (Procedure A) / ISO 3385.

[6] ASTM 3574 Section J_1 with humid aging followed by Section D compression set.

Section 7b
Additional Physical Property Testing Required for Biobased Foam Only

During the initial launch of the biobased foam program, foam producers are required to report results of tensile, tear, elongation and ball rebound to be analyzed before limits are determined.

Test	Test Method
Tensile	ASTM D3574-17 Test E
Tear	ASTM D3574-17 Test F
Elongation	ASTM D3574-17 Test E
Ball Rebound	ASTM D3574-17 Test H

Section 8
Preparing Samples for Physical Property Testing

Product Selection: The product selected for physical testing shall be the same as for analytical testing.

Sample Origin: Central samples no less than 15 in (35 cm) from a face or side of the bun shall be cut, no later than 7 days after foam production. If the foam bun is not large enough to allow the 15 in (35 cm) distance from the sides, the most central location is appropriate.

Size of Samples: 15 in x 15 in x 4 in (380 mm x 380 mm x 100 mm).
A vertical rectangular column 15 in x 15 in (380 mm x 380 mm) shall be cut to include both the top and the bottom surfaces of the produced foam. The lower 1 in (25 mm) portion of the sample column shall be removed. Starting at this lower cut surface, the column shall be cut into 15 in x 15 in x 4 in (380 mm x 380 mm x 100 mm) adjacent samples, discarding the upper trim segment such that the uppermost sample is at least 1 in (25 mm) from the top skin of the produced foam. The samples shall be numbered sequentially starting from the upper sample. 25% IFD and density results shall be reported for at least the top, middle and bottom samples for determination of 25% IFD variance.

Physical Property Testing Report: The test data shall be submitted initially and with each renewal for each foam family to the CertiPUR-US® program on the appropriate **Physical Property Testing Report** form.

Section 9
Preparing Samples for Emissions and Analytical Testing Three samples are required for submission.

Product Selection: The product selected for analytical testing shall be one frequently produced within the foam product family being certified and likely to be highest in emissions.

Sample Origin: Central samples no less than 15 in (35 cm) from a face or side of the bun shall be cut, no later than 7 days after foam production. If the foam bun is not large enough to allow the 15 in (35 cm) distance from the sides, the most central location is appropriate.

Size of Samples: 10 in x 8 in x 6 in (25 cm x 20 cm x 15 cm).

Photo Verification: Take a photo of the sample block of foam (prior to cutting) that shows the foam type, production date and size. Include the chemist or supervisor responsible in the photo. This photo will be part of your submittal package to the CertiPUR-US® program. See photos in Section 10.

Number of Samples: Three adjacent samples shall be prepared and submitted for analysis to the laboratory. Keep an extra (fourth) packaged sample as a control. Take care to ensure that no oils, silicones or other volatile materials are present on the saw blade or saw table. Protective phthalate-free gloves should be worn to prevent sample exposure to soap or hand lotion. Each sample should be conditioned using standard production procedures.

Time Constraints: The samples shall be cut out of the bun, no later than 7 days after production of the foam, and immediately packaged. Samples must be shipped to arrive at the testing lab less than 21 days after the production date and the lab must start the VOC chamber testing within 35 days of receiving the samples.

Packaging of Samples: Each 10 in x 8 in x 6 in (25 cm x 20 cm x 15 cm) sample shall be tightly wrapped and separately sealed in aluminum foil (one sample per foil package) or packaged separately inside sealed aluminized Mylar bags (one sample per bag). See photos in Section 10.

Sample Identification: Be sure to clearly mark the outside of each individually wrapped sample (do not write on the sample itself) with a foam identifier. If submitting more than one foam family for analysis in one shipping box, be sure the samples for each foam family are grouped separately. Include a **Sample Submittal and Analytical Request** form on page 11 with each foam family.

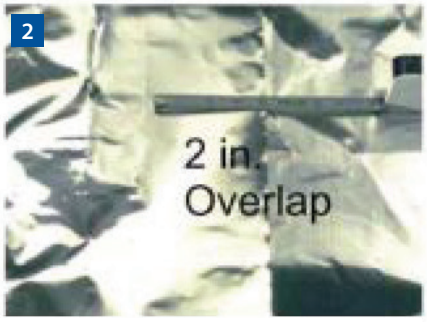
Section 10

Instructions For Packaging Samples Three samples are required for submission.

- Please be sure to wear phthalate-free polyurethane or latex gloves while handling samples. This will keep the samples from being contaminated by soap or fragrances.
- Check and clean the knife blade and saw table before cutting samples to prevent contamination from residue.
- Individually seal four samples tightly in heavy-gauge aluminum foil wrappers. Before making the final fold and seal, evacuate as much excess air as possible without resulting in a compressed sample. Submit three samples to the laboratory and keep one (1) packaged sample as a control.
- Please complete the **Sample Submittal and Analytical Request** form (page 11). If submitting a foam for biobased certification, be sure to check the box indicating biobased foam.
- Tape a duplicate **Sample Submittal and Analytical Request** form to the outside of each foil package/sample.
- Place the samples in a cardboard box, including complete **Sample Submittal and Analytical Request** form, and ship to a selected laboratory (Section 3) via express delivery service.

Note: Before taking samples, review details in Section 9.

Use 18 in wide heavy-duty aluminum foil. Place two 26 in pieces side-by-side.



Overlap the two pieces by 2 in lengthwise.

Lift the overlap, crease and fold flat for the length of the seam (26 in).

Place the foam sample in the center of the joined foil sheet lengthwise on top of the seam.

Join the side panels together at the top. Pinch the overlap, roll over twice and fold flat to seal.

Pinch the foil on the ends and squeeze together.

Roll the ends twice and press flat against the foam block.

The finished foil wrapped sample should be tightly sealed on all sides.

Remember: Only one sample per foil package.

Take a photo of chemist or supervisor next to foam block from which sample was taken. Label the foam block with this information:

Foam Identification:	(Example:100)
Production Date:	Month/Day/Year
Size:	Width x Length x Height

Section 11
Test Failures and Retesting

If a foam fails the requirements of the CertiPUR-US® program in one area of the analytical or physical property testing, the company will be allowed to have the same foam formulation retested under either of the following parameters:

- The CertiPUR-US® program will accept the retesting of the failed item of the program at the foam producer's expense, if:
  - the failure does not exceed the relative standard deviation of analysis, and
  - the retest is completed within 30 days of the original analytical or physical property testing.

Or

- If the failure exceeds the relative standard of deviation of the analysis, the CertiPUR-US® program will accept an entire retest at the foam producer's expense, if the retest is completed within 45 days of the original analytical or physical property testing.

Both the original test results with the failed item and the applicable retest, that now shows a passing result, must be submitted with the remainder of the required paperwork and photos.

Section 12
Checklist of Required Forms

- ☐ **Application/Renewal** form available online or download at **certipur.us/apply_renew**
- ☐ **Sample Submittal and Analytical Request** form (Slabstock) available in the Forms section of the **Technical Guidelines** or download at **certipur.us/forms** (to be sent with sample to your chosen laboratory. For biobased foam, be sure to check the appropriate box and confirm that your lab knows it's a biobased foam submittal.)
- ☐ **Laboratory Report on Emissions and Analysis of Content** (provided by your chosen laboratory when testing and analysis is complete)
- ☐ **Physical Property Testing Report** — available in the Forms section of the **Technical Guidelines** or at **certipur.us/forms**. Note there is a different form for biobased foam.

Section 13
Laboratory Testing Methodology and Protocols

This section provides the required test methods and protocols to be used by each of the four independent, accredited CertiPUR-US® approved laboratories to determine whether foams meet the criteria for certification set forth in these Technical Guidelines. Standardization of the process ensures consistent results.

13a Emissions Testing

Testing is to be performed according to ISO 16000-Parts 3, 6, 9 and 11 and should use a chamber volume of 0.5 m^3 (preferred) or 1 m^3. The foam sample is placed on the bottom of the emission test chamber and conditioned for 72 hours at 23 ± 2˚C, 50 ± 5% RH, applying an air exchange rate (n) of 0.5 per hour and a chamber loading (L) of 0.4 m^2/m^3 (total exposed surface of sample in relation to chamber dimensions without sealing edges and back) in accordance with ISO 16000-9:2006 and ISO 16000-11:2006.

The volatile organic compounds (VOCs) are trapped on Tenax® TA sorbent tubes with a sample volume of 5 L. Subsequent analysis is performed with thermal-desorption-GC-MS in accordance with ISO 16000-6:2021. Specified target analytes (as listed in Section 6) must be quantified and reported using substance specific standards. All other VOC compounds (including Aromatic Hydrocarbons) are semi-quantitatively expressed as toluene equivalents. All individual components are reported that have a concentration ≥ 1 µg/m^3. The $TVOC_{TIC}$ value is the sum of all components with a concentration ≥ 1µg/m^3 and eluting within the retention time window from n-hexane (C6) to n-hexadecane (C16) inclusive.

Formaldehyde shall be determined by collection of the sampled air onto a DNPH cartridge. Subsequent analysis should use HPLC/UV or HPLC/MS in accordance with ISO 16000-3:2022.

Continued

13b Metals of Concern

The subsample taken must be a composite of 6 semi-equal volume pieces taken from each sample face (to a maximum of 2 cm from the surface). The mass of the combined subsample must be recorded. The sample preparation must follow the Digestive Test Method: ASTM F963-17 Standard Consumer Safety Specification for Toy Safety, Section 8.3.1: The sample is to be completely digested with acid and analyzed by Inductively Coupled Plasma (ICP). Flexible foam under test to be digested per Consumer Product Safety Commission CPSC-CH-E1002-08.3 (Non-Metal Substrates).

Testing must also comply with Consumer Product Safety Improvement Act (CPSIA), Section 101 for total lead content. Limit of Quantitation (LOQ) should be <2.0 ppm for all substances.

13c Tributyltin

The subsample taken must be a composite of 6 semi-equal volume pieces taken from each sample face (to a maximum of 2 cm from the surface). The mass of the combined subsample must be recorded. The sample is cut and extracted for 1 hour with the extracting agent** in an ultrasonic bath at room temperature. After extraction, the alkyl tin species are derivatized by adding sodium tetraethylborate solution in THF. The derivative is then extracted with n-hexane in duplicate. Both hexane extracts are combined and used to determine the organotin compounds by gas chromatography with mass selective detection in SIM mode.

** Extracting agent: 250 ml buffer*** + 1750 ml methanol + 300 ml acetic acid
*** Buffer (pH 4,5): 164 g sodium acetate + 1200 ml water + 165 ml acetic acid, to be diluted to 2000 ml with water

13d Phthalates

The subsample taken must be a composite of 6 semi-equal volume pieces taken from each sample face (to a maximum of 2 cm from the surface). The mass of the combined subsample must be recorded. Preferably, extraction shall be performed using a Soxhlet extractor or heated ultrasonic bath. Other validated/accredited extraction procedures are allowed if prior validation confirms extraction efficiency. The final extract is analyzed using gas chromatography/mass spectrometry (GC/MS). This same extract can be used for the polybrominated flame retardant additives analysis.

Phthalates include:

- Di-(2-ethylhexyl) phthalate (DEHP) (CAS No. 117-81-7)
- Dibutyl phthalate (DBP) (CAS No. 84-74-2)
- Benzyl butyl phthalate (BBP) (CAS No. 85-68-7)
- Diisononyl phthalate (DINP) (CAS No. 28553-12-0)
- Diisobutyl phthalate (DIBP) (CAS No. 84-69-5)
- Di-n-pentyl phthalate (DPENP) (CAS No. 131-18-0)
- Di-n-hexyl phthalate (DHEXP) (CAS No. 84-75-3)
- Dicyclohexyl phthalate (DCHP) (CAS No. 84-61-7)

13e TDA/MDA

The subsample taken must be a composite of 6 semi-equal volume pieces taken from each sample face (to a maximum of 2 cm from the surface). The mass of the combined subsample must be recorded. Extraction uses multiple (minimum 4) aliquots of 1% aqueous acetic acid solution to ensure exhaustive extraction. The sample must be compressed in the solvent so that it is repeatedly absorbed and expelled from the foam over a period of five minutes for each aliquot. The final sample should be as much of the solvent that can be squeezed out of the foam and all replicate aliquots should be combined and made up to a known volume. To achieve optimal sensitivity and selectivity, the extracts should be analyzed using high-pressure liquid chromatography with detection using mass spectrometry/mass spectrometry (HPLC/MS/MS). LC-MS is acceptable only if detection limit can be achieved and false positives are shown to be avoided.

13f Polybrominated (PBDE) Flame Retardant Additives

The subsample taken must be a composite of 6 semi-equal volume pieces taken from each sample face (to a maximum of 2 cm from the surface). The mass of the combined subsample must be recorded. Preferably, extraction should be performed using a Soxhlet extractor or heated ultrasonic bath. Other validated/accredited extraction procedures are allowed if prior validation confirms extraction efficiency. The final extract is analyzed using gas chromatography/mass spectrometry (GC/MS). This may be the same extract prepared for the phthalates analysis.

Sample Submittal and Analytical Request CertiPUR-US® Slabstock Certification Program

Attention: _____

Date: _____

Ship via express to:

Lab Name: _____

Address 1: _____

Address 2: _____

City: _____

State/Province: _____

Zip/Postal Code: _____

Country: _____

Invoice to:

Company Name: _____

Email: _____

Address 1: _____

Address 2: _____

City: _____

State/Province: _____

Zip/Postal Code: _____

Country: _____

Attention: _____

Purchase Order Number: _____

Sample Identification:

Your Product Identification Code		
Plant/Location Where Sample Was Produced		
Choose One	☐ Foam Family*	
	☐ If "Other" or "Brand" Foam, Specify	
	☐ Biobased Foam†	
Foam Density/IFD		
Production Date		
Date Sample Cut (<7 Days From Production)		
Date Sample Shipped		
Sample Arrival Date (<21 Days From Production)		This Information will be reported by the testing laboratory
Date VOC Chamber Testing Started (<42 Days From Production)		This Information will be reported by the testing laboratory

*See Section 1

Analytical Request:

Emissions Testing
Extractable Heavy Metals
Tributyltin (TBT)
Sum of Eight Specified Phthalates
Penta, Octa, Deca Bromodiphenylethers (PBDEs) Flame Retardants
2,4-Toluenediamine (TDA) and 4,4'-Diaminodiphenylmethane (MDA)
Specified Volatile Organic Compounds and Total Volatile Organic Compounds
†For Biobased Foams Only: Carbon-14 Analysis (ASTM D6866-22 Method B)

Submit **three** samples to lab. Keep an extra (fourth) packaged sample as a control.

Physical Property Testing Report for Slabstock Foam

Company Name:			
Production Location:			
Foam Family:			
Foam Identification (Grade): Test Results*			
Density and 25% IFD Test Date:			
Sample Number	**Density**	**25% IFD**	**Limit**
1 (Top)			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
Average of Above:			
	25% IFD Variance:		± 10% or 3.0 lbs (13.3 N)
	Results	**Test Date**	
25% IFD Loss After Fatigue: Test Date:			< 6 lbs (26.7 N)
75% Compression Set: Test Date:			10% (20% HR or melamine)
Humid Aged 75% Compression Set: Test Date:			10% (30% HR or melamine)
* For sampling procedures and test methods, see Sections 7 and 8 of the **Technical Guidelines** at certipur.us/technicalguidelines			

I confirm the above information is accurate. First Name/Last Name (printed): _____

Signature: _____ Date: _____

Physical Property Testing Report for Biobased Foam Family Only

Company Name:

Production Location:

Biobased Foam Family:

Foam Identification (Grade):

Test Results*

In the charts below, fill in green fields:

Density and 25% IFD

Test Date:

Sample Number	Density ASTM D3574-17 Test A	25% IFD ASTM D3574-17 Test B_1	Limit
1 (Top)			
2			
3			
4			
5			
6			
7			
8 (Bottom)			
Average of Above:			
25% IFD Variance:			± 10% or 3.0 lbs. (13.3 N)

Physical Property	Test Method	Test Date	Test Results	Limit
Tensile †	ASTM D3574 -17 Test E			
Tear †	ASTM D3574-17 Test F			
Elongation †	ASTM D3574-17 Test E			
Ball Rebound †	ASTM D3574-17 Test H			
25% IFD Loss After Fatigue Only applies to foams within 25% IFD range of 24 to 36 lbs. (100 – 160 N)	ASTM D3574-17 Test I_3 Procedure A			Loss < 6 lbs. (26.7 N)
75% Compression Set	ASTM D3574-17 Test D			10% or (20% HR or melamine)
Humid Aged 75% Compression Set	ASTM D3574-17 Test D and J[1]			20% or (30% HR or melamine)

* For sampling procedures and test methods, see Sections 7 and 8 of the Technical Guidelines at certipur.us/technicalguidelines

† During the initial launch of the biobased foam program, foam producers are required to report results of tensile, tear, elongation and ball rebound to be analyzed before limits are determined.

I confirm the information above is accurate. First Name/Last Name (printed): _____

Signature: _____ Date: _____