

# U.S. Voluntary Physical Performance and Environmental Guidelines for Prime Flexible Polyether Polyurethane Foam for Use in Furniture and Bedding

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U.S. Voluntary Physical Performance and Environmental Guidelines for Prime Flexible Polyether Polyurethane Foam for Use in Furniture and Bedding Items.

Section 1  
Voluntary Internal Physical Performance Testing

25% IFD loss after Fatigue Test		
Within IFD @ 25% Range of 24 - 36 Lbs (11kg - 16kg) <sup>1</sup>	6 Lbs. (2.7 kg) max	Test Method ASTM D3574 <sup>2</sup>
75% Compression Set		
HR-type and Melamine-filled Foams <sup>1</sup>	20% max	Test Method ASTM D3574 <sup>Test D</sup>
All Others, Including Conventional & Viscoelastic	10% max	
Humid Aged 75% Compression Set		
HR-type and Melamine-filled Foams <sup>1</sup>	30% max	Test Method ASTM D3574 <sup>Tests D and J</sup>
All Others, Including Conventional & Viscoelastic	10% max	
IFD @ 25% Tolerance <sup>1</sup>	± 10%	Test Method ASTM D3574 <sup>B1</sup>

<sup>1</sup> Based on a 15" x 15" x 4" (380 mm x 380 mm x 102 mm) Sample. For other sample sizes see AHFA/PFA Joint Industry Standard Section 4.5.8.

<sup>2</sup> Constant Force Pounding, 8000 cycles  
ASTM D3574 Test I<sub>3</sub> / ISO 3385

<sup>Test J</sup> ASTM 3574 Section J<sub>1</sub> with Humid Aging

<sup>B1</sup> ASTM Method D3574 Section B<sub>1</sub>

Section 2  
Voluntary Manufacturer Certifications

Foam or adhesives processed with CFC or Other Ozone Depleters	NO
Foam or adhesives processed with MeCl <sub>2</sub> or nPB	NO
Foam processed with BHT Polyol Additives	NO
Foam processed with any PBDE Additives	NO

**Section 3**  
Voluntary Independent Laboratory Emissions Testing  
(^These chemicals, if present, should not exceed permitted limits.)

Substance	CAS-No.	Guideline Limit [mg/m <sup>3</sup> ]
Formaldehyde	50-00-0	0.1 <sup>^</sup>
Benzene	71-43-2	0.5 <sup>^</sup>
Toluene	108-88-3	0.5 <sup>^</sup>
Styrene	100-42-5	0.3 <sup>^</sup>
Vinylcyclohexene	100-40-3	< LOD *
4-Phenylcyclohexene	4994-16-5	< LOD *
Butadiene	106-99-0	< LOD *
Vinyl Chloride	75-01-4	< LOD *
Aromatic hydrocarbons		0.5

Maximum TVOC Emissions (base rate)	0.5
plus, allowance for surfactants	0.3
Total Allowable TVOC Emissions	0.8

\* Below the Limit of Detection

#### Test Method

ASTM Method D5116-97 Small Chamber Test with chamber conditioning for 16 hours.

#### Section 4

#### Voluntary Independent Laboratory Analysis

#### Extractable Metals

Substance	CAS-No.	Guideline Limit [ppm]
Antimony (Sb)	7440-36-0	0.5
Arsenic (As)	7440-38-2	0.2
Cadmium (Cd)	7440-43-9	0.1
Chromium total (Cr)	7440-47-3	1.0
Chromium VI (Cr VI)	18540-29-9	< LOD *
Cobalt (Co)	7440-48-4	0.5
Copper (Cu)	7440-50-8	2.0
Lead (Pb)	7439-92-1	0.2
Nickel (Ni)	7440-20-0	1.0
Mercury (Hg)	7439-97-6	0.02
Selenium (Se)	7782-49-2	0.5

#### Test Method

The 0.2 in x 0.2 in x 0.2 in (5 mm x 5 mm x 5 mm) sample shall be cut by the laboratory and extracted for 8 hours with an artificial acidic sweat solution (cf. ISO 105-E04 (1994)) at 40°C on a shaking water bath using a ratio S/L=1/20 (S=solid, L=liquid).

Determination by Atomic Absorption Spectroscopy (AAS) or Inductively Coupled Plasma (ICP). For Cr VI, by spectrophotometry (SP).

#### Tributyltin

Substance	CAS-No.	Guideline Limit [ppm]
Tributyltin (TBT)	688-73-3	0.5

#### Test Method

The 0.2 in x 0.2 in x 0.2 in (5 mm x 5 mm x 5 mm) sample shall be cut by the laboratory and extracted for 1 hour with an artificial acidic sweat solution (cf. ISO 105-E04 (1994)) at 40°C by means of ultrasonic techniques, using a ratio S/L=1/20 (S=solid, L=liquid).

The extract is analyzed by gas chromatography (GC) or gas chromatography/mass spectrometry (GC/MS).

#### Phthalates

Substance	CAS-No.	Guideline Limit
Sum of 6 phthalates*		≤ 0.01 wt %

#### Test Method

Soxhlet extractor with an organic solvent (i.e. dichloromethane) followed by analysis with gas chromatography/mass spectrometry (GC/MS), or high performance liquid ultraviolet chromatography (HPLC/UV).

\* Phthalates include: Diisononyl phthalate CAS No - 28553-12-0; Di-n-octylphthalate CAS No – 117-84-0; Di-2-ethylhexyl phthalate CAS No -117-81-7; Di-isodecyl phthalate CAS No – 26761-40-0; Butylbenzylphthalate CAS No – 85-68-7 and Dibutyl phthalate CAS No – 84-74-2.

#### TDA / MDA

Substance	CAS-No.	Guideline Limit
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) and MDA (4,4')		≤ 5.0 ppm

#### Test Method

A subsample shall be cut and extracted with 1% aqueous acetic acid solution. To achieve optimal sensitivity and selectivity, the extracts are analyzed using high pressure liquid chromatography with detection using mass spectrometry/mass spectrometry (HPLC/MS/MS).

#### Polybrominated Fire Retardant Additives

Substance	CAS-No.	Guideline Limit
pentabromodiphenyl ether	32534-81-9	≤ 0.01 wt %
octabromodiphenyl ether	32536-52-0	≤ 0.01 wt %
decabromodiphenyl ether	1163-19-5	≤ 0.01 wt %

#### Test Method

Analysis with gas chromatography/mass spectrometry (GC/MS)

#### Section 5

##### Prohibited Substances

R-Phrase (Based on European Union Risk Assessments)
R45 (may cause cancer)
R46 (may cause heritable genetic damage)
R49 (may cause cancer by inhalation)
R60 (may impair fertility)
R61 (may cause harm to the unborn child)

Blowing Agents
CFC
HCFC
Methylene Chloride

Other Prohibited Substances	CAS-No.
Chlorinated or brominated dioxins or furans	
Chlorinated hydrocarbons (1,1,2,2-Tetrachloroethane, Pentachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethylene)	
Chlorinated phenols (PCP, TeCP)	87-86-5
Hexachlorocyclohexane	58-89-9
Monomethyldibromo- Diphenylmethane	99688-47-8
Monomethyldichloro- Diphenylmethane	81161-70-8
Nitrites	
Polybrominated Biphenyls (PBB)	59536-65-1
Polychlorinated Biphenyls (PCB)	1336-36-3
Polychlorinated Terphenyls (PCT)	61788-33-8
Tri-(2,3-dibromo-propyl)-phosphate (TRIS)	126-72-7
Trimethylphosphate	512-56-1
Tris-(aziridinyl)-phosphin oxide (TEPA)	5455-55-1

## Section 6 Sampling Procedure

Sample Origin: Central samples no less than 15 inches from a face or side of the bun shall be cut, no later than 7 days after foam production.

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

Number of Samples: Two adjacent samples shall be prepared for the baseline study and then shall be sent to the laboratory. Care shall be taken to assure 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. The samples each shall be conditioned using standard production procedures, packaged and identified as recommended below.

Conditioning Period: The samples shall be cut out of the bun, no later than 7 days after production of the foam, and immediately packaged.

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 (as per photo, one sample per foil package) or packaged separately inside sealed aluminized Mylar bags (one sample per bag).

Sample Identification: Sample Identification shall be recorded and attached to the outside packaging of each individual sample. The information shall include foam family, foam grouping (as in Section 6), density and firmness, company production reference code number, production date, date of sampling, and date of mailing to the laboratory. See attached form (Appendix A).

## Section 7 Voluntary Guidelines - Certification Groupings

The manufacturer may apply voluntary guidelines certification to groups of equivalent qualified flexible polyether polyurethane foam products (i.e. a number of FPF 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 manufacturer to notify raw material suppliers when voluntary registration has been achieved so that they can advise the foam manufacturer if raw material formulation changes are anticipated during the duration of the voluntary guidelines registration period.

Product groups:

Conventional polyether foam

Conventional FR polyether foam (sharing the same fire retardant package)

Super-soft (low density/low index) conventional foam ( $\leq 15$  lbs. IFD and  $\leq 1.5$  PCF)

High resilience foam

Viscoelastic foam

Other (please describe in detail – to be reviewed by administrator)

## Section 8 Voluntary Registration Duration

To maintain voluntary registration, sample evaluations are necessary at 6 month intervals for each product group category to help demonstrate formulation and raw material content consistency. After completing two consecutive 6 month successful certifications, the registration frequency shall change to an annual basis. Any significant changes to the formulation shall require analysis and re-registration.



## Sample Submittal and Analytical Request CertiPUR-US Voluntary Certification Program

Attention: \_\_\_\_\_

### Ship Via Express To:

Lab Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City / State / Zip: \_\_\_\_\_

Country \_\_\_\_\_

### Invoice to:

Co. Name: \_\_\_\_\_

Address 1: \_\_\_\_\_

Address 2: \_\_\_\_\_

City / State / Zip: \_\_\_\_\_

Country: \_\_\_\_\_

Attention: \_\_\_\_\_

P.O. Number: \_\_\_\_\_

### Sample Identification:

	Information:
Your Product Code	
Product Group *	
Foam Density/IFD	
Production Date	
Date Sample Cut	
Shipping Date	
Sub Samples Shipped	FOR INTERNAL LABORATORY USE
Report Results	<input type="checkbox"/> To Submitting Company & AFPF <input type="checkbox"/> To Submitting Company Only

\* See Section 7 for Product Grouping – If “other”, please specify

### Analytical Request:

TVOC Emissions Testing

Extractable heavy metals

Tributyltin (TBT)

Sum of six specified phthalate plasticizers

Penta, Octa, Deca bromodiphenylethers (PBDE's) - fire retardants

2,4 Toluenediamine (TDA) and 4,4' Diaminodiphenylmethane (MDA)

Specified Volatile Organic Compounds and total Volatile Organic Compounds

## Sample Packaging Instructions

1. Please be sure to wear phthalate-free PU or latex gloves while handling samples. This will keep the samples from contamination by soap or fragrances.
2. Check and clean the knife blade and saw table before cutting samples to prevent contamination from residue.
3. Seal *three samples* tightly in individual heavy gauge aluminum foil wrappers. Before making the final fold and seal, evacuate as much excess air as possible. Submit *two samples* to the laboratory and *keep one packaged sample* as a control.
4. Please complete the *Sample Submittal Form* (above) and indicate to whom results should be reported. If you do not wish to have test results shared with AFPPF, please instruct the lab that you will require an affidavit of satisfactory results.
5. Tape a duplicate *Sample Submittal Form* to the outside of each foil package.
6. Place the samples in a cardboard box, including complete *Sample Submission Forms*, and ship to a selected laboratory via express delivery service.

### **CertiPUR-US testing and analysis laboratory options (effective 06-03-08):**

Hall Analytical  
Unit A Millbrook Business Centre  
Floats Road  
Manchester M23 9YJ  
United Kingdom  
Attn: Mr Malcolm Kimber  
Telephone: (011) 44 161 286 7889  
Fax: (011) 44 161 286 7676  
Email: malcolm@hallanalytical.co.uk

LGA QualiTest GmbH  
Tillystraße 2  
90431 Nuremberg  
Germany  
Attn: Christian Sieber  
Telephone: (011) 49 911 655-57 76  
Fax: (011) 49 911 655-57 77  
Email: christian.sieber@lga.de

Eurofins Environment A/S, Denmark  
Smedeskovvej 38  
DK-8464  
Galten Danmark  
Attn: Reinhard Oppl  
Telephone: (011) 49 40 492 94 333  
Fax: (011) 49 40 492 94 99 333  
Email: ReinhardOppl@Eurofins.com

## Release of Test Results Information

\_\_\_\_\_Company Name\_\_\_\_\_, having offices located at street address\_\_\_\_\_, in  
city\_\_\_\_\_, state\_\_\_\_\_, in consideration of participation in the Alliance for  
Flexible Polyurethane Foam (AFPF) voluntary CertiPUR-US<sup>CM</sup> evaluation, analysis and  
certification program, hereby authorizes (insert laboratory name and address), to provide to  
release the results of tests performed on our sample(s) for CertiPUR-US control purposes.

Submission of test results is strictly voluntary. You may optionally request the laboratory to  
issue a statement of compliance to AFPF. In addition to CertiPUR-US registration fees,  
laboratory evaluation and analysis costs will be borne by individual companies in accordance  
with the fees and participation requirements specified in CertiPUR-US program policies.

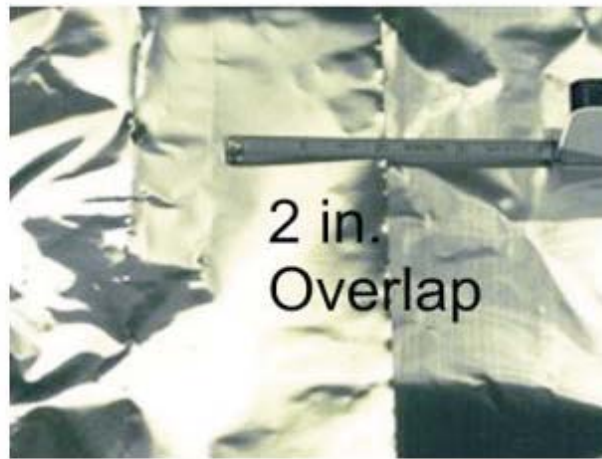
\_\_\_\_\_  
Company

\_\_\_\_\_  
Company officer signature, title

\_\_\_\_\_  
(date)



Use 18" wide heavy duty aluminum foil. Place 2, 26" pieces side-by-side.



2 in.  
Overlap

Overlap the two pieces by 2" - lengthwise.



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



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



TOP  
SEAL

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.

