



April 4, 2005

To Whom It May Concern:

"ICF products are stay-in-place forming products for cast-in-place concrete walls. The ICF forming system has no final structural value for the wall. It is the concrete wall that is cast between the inner faces of the panels of expanded or extruded polystyrene foam that is the structural component. Strictly speaking, this is no different from a traditional cast-in-place concrete wall. Concrete walls, including the ICF's are typically designed according to the current ACI 318 design code."

Excerpt taken from the Insulating Concrete Forms Association (ICFA) at:
http://www.forms.org/search/downloads/FL_Blding_Code_Interpretation_for_ICFA.doc

BuildBlock Insulating Concrete Forms (ICF's) are manufactured using Expandable Polystyrene bead (EPS). BuildBlock ICF's manufactured in Colorado Springs, Colorado and Pardeeville, Wisconsin currently use the **40 series** from Huntsman, the **BFL type** from BASF and the **M97 bead** from Nova. BuildBlock ICF's manufactured at the Jerome and Post Falls, Idaho locations currently use the **MC-500 type** from Styrochem and the **Starex SF series** from Korea.

BuildBlock ICF's are manufactured with a **density of 1.50 pcf**, and a **thickness of 2.5 inches**. Expandable Polystyrene complies with all major building codes in the US and Canada. Please see the Underwriters Laboratory report for flame spread and smoke developed data, and the ICC-ES Legacy reports ER-5703, ER-3401, ER-5770, ER-5687 and ER-5624 for evidence submitted and specific code compliance information.

Sincerely,

Eric Williams, National Sales Manager



BRYX.R7503

Foamed Plastic

See [General Information for Foamed Plastic](#)

HUNTSMAN EXPANDABLE POLYMERS CO L C

R7503

3040 POST OAK BLVD
HOUSTON, TX 77056 USA

Foamed plastic in the form of blocks and boards.

Type Grade 54

	1 In. Max +	2 In. Max +	4 In. Max +	5 In. Max +
Flame spread	5#	5##	5###	5###
Smoke developed	40#	40-100##	80-160###	80-200###

+Installed in a thickness, or stored in an effective thickness, as indicated, for a density of 1.0 lb/fr .

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 0 and smoke developed classification of 180.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 20 and smoke developed classification of 500 - over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 20 - 35 and smoke developed classification of 500 - over 500.

Type Grade 54

	1 In. Max +	2 In. Max +	4 In. Max +	5 In. Max +
Flame spread	5#	5##	5##	5###
Smoke developed	50-110#	50-130##	145##	145###

+Installed in a thickness, or stored in an effective thickness, as indicated, for a density of 1.5 lb/ft³.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 5 and smoke developed classification of 350 - 400.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 10 - 40 and smoke developed classification of 350 - over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 125 and smoke developed classification of over 500.

Type Grade 54

	1 In. Max +	2 In. Max +	4 In. Max +	5 In. Max +
Flame spread	5#	5##	5###	5####
Smoke developed	10-70#	55-200##	55-200###	55-200####

+Installed in a thickness, or stored in an effective thickness, as indicated, for a density of 1.75 lb/cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 15 and smoke developed classification of 450 - over 500.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 15 - 30 and smoke developed classification of 450 - over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 15 - 80 and smoke developed classification of over 500.

####Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 100 and smoke developed classification of over 500.

Type Grade 54

	5 in. Max+
Flame Spread	5#
Smoke Developed	15#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 2.00 lb/ft³.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 135 and smoke developed classification of Over 500.

Type Grade 40

	5 in. Max+
Flame Spread	5#
Smoke Developed	200#

+Installed in a thickness, or stored in an effective thickness, as indicated, for a density of 1.00 lb/ft(3).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 35 and smoke developed classification of Over 500.

Type Grade 40

	5 in. Max+
Flame Spread	5#
Smoke Developed	200#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 1.25 lb/ft(3).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 110 and smoke developed classification of Over 500.

Type Grade 40

	5 in. Max+
Flame Spread	5#
Smoke Developed	250#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 1.50 lb/ft(3).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 140 and smoke developed classification of Over 500.

Type Grade 40

6 in. Max+

Flame Spread	5#
Smoke Developed	250#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 1.75 lb/ft(3).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 140 and smoke developed classification of Over 500.

Type Grade 40

	6 in. Max+
Flame Spread	20#
Smoke Developed	250#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 2.00 lb/ft(3).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 140 and smoke developed classification of Over 500.

Last updated on 2004-12-03

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a safer world



Filing Category: INSULATION

HUNTSMAN EXPANDABLE POLYSTYRENE BEADS

HUNTSMAN CORPORATION
3040 POST OAK BLVD,
HOUSTON, TEXAS 77056

1.0 SUBJECT

Huntsman Grades 54 and 40 Expandable Polystyrene Beads.

2.0 DESCRIPTION

2.1 General:

Expandable polystyrene beads designated as Huntsman Grades 54 and 40, produced by Huntsman Corporation, are used by independent manufacturers in producing expanded polystyrene (EPS) insulation board. Products are produced solely through the introduction of heat, without other additives. Boards manufactured from Grade 54 beads at a maximum density of 1.75 pcf (28 kg/m³) and a maximum thickness of 5 inches (127 mm), and boards manufactured from Grade 40 beads at a maximum density of 2.0 pcf (32 kg/m³) and a maximum thickness of 5 inches (127 mm), have a flame-spread rating of 25 or less and a smoke-developed rating of 450 or less when tested in accordance with UBC Standard 8-1 (ASTM E 84). Boards manufactured from Grade 54 and Grade 40 beads at a maximum density of 2.0 pcf (32 kg/m³) and a maximum thickness of 5 inches (127 mm) have a flame-spread rating of 25 or less and a smoke-developed rating of 450 or less when tested in accordance with UBC Standard 8-1 (ASTM E 84).

Huntsman Grade 54 and Grade 40 expandable beads can be used to produce expanded polystyrene products that comply with Types I, II, VIII and IX [1.0, 1.5, 1.25 and 2.0 pcf (16, 24, 20 and 32 kg/m) nominal density, respectively] of ASTM C 578-95, provided the final product is recognized in a current ICBO ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of the ICBO ES Acceptance Criteria for Foam Plastic Insulation (AC12).

2.2 Installation:

2.2.1 General: Foam plastic boards produced from the Huntsman beads must be installed in accordance with the ICBO ES evaluation report on the boards and the applicable code.

2.2.2 Special Use: Foam plastic boards produced from the Huntsman Grade 54 beads can be used on walls in attics and crawl spaces with no covering applied to the attic or crawl space side of the foam plastic, provided all of the following conditions are met:

1. Entry to the attic or crawl space is only to service utilities, and heat-producing appliances are not permitted.

2. There are no interconnected attic or basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Attic ventilation is provided that complies with Section 1505 of the 1997 *Uniform Building Code*™, Section 1202.2 of the 2000 *International Building Code*® or Section R806 of the 2000 *International Residential Code*®, as applicable. Under-floor ventilation is provided that complies with Section 2306.7 of the UBC, Section 2304.11.9 of the IBC or Section R408.1 of the IRC, as applicable.
5. Boards produced from Grade 54 beads have a maximum thickness of 3 inches (76 mm) for 1.0 pcf (16.0 kg/m³) density boards and a maximum thickness of 3 inches (76 mm) for 2.0 pcf (32 kg/m³) density boards.

2.3 Identification:

Each container of beads bears a label with the Huntsman Corporation name and address, the bead identification, the evaluation report number (ICBO ES ER-5703) and the name of the quality control agency (Underwriters Laboratories Inc.).

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with UBC Standard 8-1 (ASTM E 84), ASTM C 578-95, and NFPA 259-98; reports of comparative crawl space fire tests; and a quality control manual.

4.0 FINDINGS

That the Huntsman expandable polystyrene beads described in this report comply with the 1997 *Uniform Building Code*™ (UBC), the 2000 *International Building Code*® (IBC) and the 2000 *International Residential Code*® (IRC), subject to the following conditions:

- 4.1 The maximum density and thickness of the expanded beads are as noted in this report.
- 4.2 Use of the beads is limited to products recognized in an ICBO ES evaluation report.
- 4.3 Except as noted in Section 2.2.2 of this report, the insulation boards produced from the Huntsman beads are separated from the building interior by a thermal barrier complying with Section 2602.4 of the UBC, Section 2603.4 of the IBC or Section 318.1.2 of the IRC.
- 4.4 The beads are produced by Huntsman in Peru, Illinois, and Mansonville, Quebec, Canada, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

This report is subject to re-examination in two years.

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BRYX.R5817

Foamed Plastic

See **General Information** for Foamed Plastic

BASF CORP
POLYMERS DIV
 3000 CONTINENTAL DR N
 MT OLIVE, NJ 07828 USA

R5817

Foamed plastic in the form of boards.

SURFACE BURNING CHARACTERISTICS

TYPES BF-020, BF-122, BF-134, BF-222, BF-229, BF-322, BF-326, BF-327, BF-329, BF-421, BF-422

TYPES BFL-020, BFL-122, BFL-134, BFL-222, BFL-229, BFL-322, BFL-326, BFL-327, BFL-421, BFL-422

STYROPOR F212, F312, F412

Density Maximum Thickness

	1.0 pcf 6 In. *	1.25 pcf 6 In. *	1.5 pcf 5 In. *	2.0 pcf 5 In. *
Flame spread	15#	5##	10###	5####
Smoke developed	125#	190##	300###	250####

#Installed in a thickness or stored in an effective thickness for the density indicated.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 50 and smoke developed classification of over 500.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 30 and smoke developed classification of over 500.

####Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 120 and smoke developed classification of over 500.

#####Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 105 and smoke developed classification of over 500.

Styropor Types AF112, AF212, AF312, AF412, AF512

	2.5 cm (1 In.) Max+	5.1 cm (2 In.) Max+	10.2 cm (4 In.) Max+
Flame spread	5#	5##	5###
Smoke developed	115#	115##	200###

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 17 Kg/M cubed (1.1 pcf).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 5 and smoke developed classification of 350.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 35 and smoke developed classification of over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 25 and smoke developed classification of over 500.

Styropor Types AF112, AF212, AF312, AF412, AF512

	2.5 cm (1 In.) Max+	5.1 cm (2 In.) Max+	10.2 cm (4 In.) Max+
Flame spread	5#	5##	5###
Smoke developed	175#	175##	200###

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 20 Kg/M cubed (1.25 pcf).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 5 and smoke developed classification of 400.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame

spread classification of 35 and smoke developed classification of over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 180 and smoke developed classification of over 500.

Styropor Types AF112, AF212, AF312, AF412, AF512

	2.5 cm (1 In.) Max+	5.1 cm (2 In.) Max+	10.2 cm (4 In.) Max+
Flame spread	5#	5##	5###
Smoke developed	175#	175##	175###

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 25 Kg/M cubed (1.5 pcf).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 5 and smoke developed classification of 350.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 35 and smoke developed classification of over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 180 and smoke developed classification of over 500.

Styropor Types AF112, AF212, AF312, AF412, AF512

	12.7 cm (5 In.)
Flame spread	10#
Smoke developed	10#

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 32 Kg/M cubed (2.0 pcf).

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread classification of 120 and smoke developed classification of over 500.

Last Updated on 2004-12-02

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Filing Category: INSULATION

EXPANDABLE POLYSTYRENE BEADS

BASF CORPORATION
1065 CRANBURY AND SOUTH RIVER ROAD
JAMESBURG, NEW JERSEY 08831

1.0 SUBJECT

BASF Styropor® Types BF, BFL and Expandable Polystyrene Beads.

2.0 DESCRIPTION

2.1 General:

Expandable polystyrene beads designated as BASF Styropor® Types BF and BFL are used by independent manufacturers in the production of expanded polystyrene (EPS) insulation board. Products are produced solely through the introduction of heat, without other additives. The beads are expanded and molded into foam plastic boards having a maximum thickness and density noted in Table 1 of this report. At densities and thicknesses no greater than those specified in Table 1, foam plastic boards produced from the BASF beads have a flame-spread rating of 25 or less and a smoke-developed rating of 450 or less.

Type BF and Type BFL expandable beads can be used to produce expanded polystyrene products that comply with Types I, VIII, II and IX of ASTM C 578, provided the final product is recognized in a current ICBO ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of the ICBO ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated January 2002.

2.2 Installation:

2.2.1 General: The foam plastic boards produced from the BASF beads must be installed in accordance with their individual ICBO ES evaluation reports and the code.

2.2.2 Special Use: The foam plastic boards produced from the BASF beads can be used on walls in attics and crawl spaces with no covering applied to the attic or crawl space side of the foam plastic, provided all of the following conditions are met:

1. Entry to the attic or crawl space is only to service utilities, and heat-producing appliances are not permitted.
2. There are no interconnected attic or basement areas.

3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Ventilation is provided that complies with Section 1505 or Section 2306.7 of the 1997 *Uniform Building Code*™ (UBC), as applicable.
5. Boards have a maximum density and thickness of 1.0 pcf (16.0 kg/m³) and 3 inches (76 mm), respectively.
6. Boards have a maximum density and thickness of 2.0 pcf (32.0 kg/m³) and 2 inches (51 mm), respectively.

2.3 Identification:

Each container of beads bears a label with the BASF Corporation name and address, the bead type, the evaluation report number (ICBO ES ER-3401) and the name of the quality control agency (Underwriters Laboratories Inc.).

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with UBC Standard 8-1 (ASTM E 84) and ASTM C 578-95, and a quality control manual.

4.0 FINDINGS

That the BASF expandable polystyrene beads described in this report comply with the 1997 *Uniform Building Code*™ (UBC), the 2000 *International Building Code*® (IBC) and the 2000 *International Residential Code*® (IRC), subject to the following conditions:

- 4.1 **The maximum density and thickness of the expanded beads are as noted in this report.**
- 4.2 **Use of the beads is limited to products recognized in an ICBO ES evaluation report.**
- 4.3 **Except as noted in Section 2.2.2 of this report, the insulation boards produced from the BASF beads are separated from the building interior by a thermal barrier complying with Section 2602.4 of the UBC, Section 2603.4 of the IBC or Section 318.1.2 of the IRC.**
- 4.4 **The beads are produced by BASF in Jamesburg, New Jersey, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).**

This report is subject to re-examination in two years.

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TABLE 1—BASF STYROPOR BEADS

BEAD TYPE	BEAD SIZE	MAXIMUM DENSITY (pcf)	MAXIMUM THICKNESS (inches)
BF	122, 222, 229, 322, 326, 327, 329, 421 and 422	1.25	6
		2.0	5
BFL	122, 222, 229, 322, 326, 327, 421 and 422	1.25	6
		2.0	5

For **SI**: 1 pcf = 16.018 kg/m³, 1 inch = 25.4 mm.



BRYX.R4775

Foamed Plastic

See General Information for Foamed Plastic

NOVA CHEMICALS INC
 400 FRANKFORT RD
 MONACA, PA 15061 USA

R4775

Foamed plastic in the form of blocks and boards.

Type M-77

(B, B-HD, B-LV, BC)

or Type M-97 (BC)

	1 In. Max *
Flame spread	5+
Smoke developed	55-90+

* Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.0 pcf.

+Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated Flame spread index of 10 and a total smoke developed index of 200.

	2 In. Max *	4 In. Max *	5 In. Max *	6 In. Max *
Flame spread	5+	5++	5++	5++
Smoke developed	55-90+	55-90++	55-175++	55-175++

* Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.0 pcf.

+Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 40 and a total smoke developed index of 450.

++Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 80 and a total smoke developed index of 450 to over 500.

Type M-77

(B, B-HD, B-LV, BC)

or Type M-97 (BC)

	1 In. Max *	3 In. Max *	4 In. Max *	5 In. Max *	6 In. Max *
Flame spread	5+	5++	5——	5++++	5++++
Smoke developed	20+	40-65++	40-65——	40-180++++	40-180——+

*Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.5 pcf.

+Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 25 and a total smoke developed index of 450.

++Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 75 and a total smoke developed index of 450 to over 500.

+++Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 90 and a total smoke developed index of over 500.

++++Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 95 and a total smoke developed index of over 500.

Type M-77

(B, B-HD, B-LV, BC)

or Type M-97 (BC)

	1 In. Max *	3 In. Max *	4 In. Max *	5 In. Max *	6 In. Max
Flame spread	5+	10+	10++	10++	10++
Smoke developed	75+	115+	11 5-1 70++	11 5-1 70++	11 5-1 70++

* Installed in a thickness, or stored in an effective thickness, as indicated, for a density of 2.0 pcf.

+Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 45-80 and a total smoke developed index of over 500.

++Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to a calculated flame spread index of 45-130 and a total smoke developed index of over 500.

**33M(A, A-HD, A-NL, B, B-HD, B-HDS, B-NL, C), MOD-OGFS,
-OGMF, -OGMO or 35M(A, B, B-K, B-LL or C)**

	1In. +	1-5/8 In. +	2 In. +	4 In. +	5 In. +
Flame spread	5	5##	5###	5####	5#####
Smoke developed	50#	15-85##	40###	20####	145#####

+Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.0 pcf.

#Smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in a smoke developed index of 250-300.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 5 and smoke developed index of 350-450.

###Flame spread and smoke developed recorded while material remained in original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 5 and smoke developed index of 500.

####Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 15 and smoke developed index of 350-450.

#####Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 15-35 and smoke developed index of 400 - over 500.

**33M(A, A-HD, A-NL, B, B-HD, B-HDS, B-NL, C), MOD-OGFS,
-OGMF, -OGMO or 35M(A, B, B-K B-LL or C)**

	4In.+	5 In. Max +
Flame spread	5#	5##
Smoke developed	60-180#	60-300##

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 1.25 lb per cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 20 and smoke developed index of 300 - over 500.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 40 and smoke developed index of 300 - over 500.

**33M(A, A-HD, A-NL, B, B-HD, B-HDS, B-NL, C), MOD-OGFS,
-OGMF, -OGMO or 35M(A, B, B-K B-LL or C)**

	1In. +	1-5/8 In. +	6 In. Max +
Flame spread	5#	5##	5###
Smoke developed	15-50#	15-40##	165-200###

+Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.5 pcf.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 10 and smoke developed index of 450.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 15 and smoke developed index of 500 to over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 20 and smoke developed index of over 500.

**33M(A, A-HD, A-NL, B, B-HD, B-HDS, B-NL, C), MOD-OGFS,
-OGMF, -OGMO or 35M(A, B, B-K B-LL or C)**

	1 In. +	4 In. +	5 In. +
Flame spread	5#	5##	5###
Smoke developed	10#	15-160##	10###

+Installed in a thickness, or stored in an effective thickness as indicated, for a density of 2.0 pcf. #Flame spread and smoke developed recorded while material remained in the original test position.

Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 20 and smoke developed index of over 500.

##Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 85 and smoke developed index of over 500.

###Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 125 and smoke developed index of over 500.

Last Updated on 2004-12-06

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Filing Category: INSULATION

EXPANDABLE POLYSTYRENE BEADS

NOVA CHEMICALS INCORPORATED
400 FRANKFORT ROAD
MONACA, PENNSYLVANIA 15061

1.0 SUBJECT

33M, 35M, M77 and M97 Expandable Polystyrene Beads.

2.0 DESCRIPTION

2.1 General:

Expandable polystyrene beads, produced by NOVA Chemicals Incorporated, are designated as resin Types 33M, 35M, M77 and M97, and are used by independent manufacturers to produce expanded polystyrene (EPS) insulation board. The boards are produced by introducing steam into a heating chamber containing the unexpanded beads. The process expands the beads, which are then molded into insulation products, with maximum thicknesses and densities as noted in Table 1 of this report. The end use of the expandable polystyrene beads, including the manufacture of boards, is not part of this report. At densities and thicknesses no greater than those specified in Table 1, foam plastic boards produced from the NOVA Chemicals Incorporated beads have a flame-spread rating of 25 or less and a smoke-developed rating of 450 or less when tested in accordance with UBC Standard 8-1 (ASTM E 84).

Types 33M, 35M, M77 and M97 expandable polystyrene beads can be used to produce expanded polystyrene products that comply with Types I, II and VIII of ASTM C 578-95, provided the final product is recognized in a current ICBO ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of the ICBO ES Acceptance Criteria for Foam Plastic Insulation. Additionally, Types M77 and M97 expandable polystyrene beads can be used to produce expanded polystyrene products that comply with Type IX of ASTM C 578-95, provided the final product is recognized in a current ICBO ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of AC12.

2.2 Installation:

2.2.1 General: The foam plastic boards produced from the NOVA Chemicals Incorporated beads must be installed in accordance with their individual ICBO ES evaluation reports and the applicable code.

2.2.2 Special Use: The foam plastic boards produced from the NOVA Chemicals Incorporated beads can be used on walls in attics and crawl spaces with no covering applied to the attic or crawl-space side of the foam plastic, provided all of the following conditions are met:

1. Entry to the crawl space is only to service utilities, and heat-producing appliances are not permitted.
2. There are no interconnected attic or basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.
4. Ventilation is provided that complies with Section 1505 or Section 2306.7 of the 1997 *Uniform Building Code*™ (UBC), or Section 2304.11.9 of the 2000 *International Building Code*® (IBC), as applicable.

Boards are produced in one of the following ways:

1. Boards are produced from Type M77 or M97 beads and have either a maximum nominal density and a thickness of 1.0 pcf (16.0 kg/m³) and 5 inches (127 mm), respectively, or a maximum nominal density and a thickness of 1.50 pcf (24.0 kg/m³) and 2 inches (51 mm), respectively.
2. Boards are produced from Type 35M beads and have either a maximum nominal density and a thickness of 1.0 pcf (16.0 kg/m³) and 5 inches (127 mm), respectively, or a maximum nominal density and a thickness of 2.0 pcf (32.0 kg/m³) and 2 inches (51 mm), respectively.

2.3 Identification:

Each container of beads bears a label with the NOVA Chemicals Incorporated name and address; the bead type; the evaluation report number (ICBO ES ER-5770); and the name of the quality control agency (Underwriters Laboratories Inc.).

3.0 EVIDENCE SUBMITTED

Data in accordance with the ICBO ES Acceptance Criteria for Foam Plastic Insulation (AC12), dated July 2001; reports of tests in accordance with UBC Standard 8-1 (ASTM E 84) and ASTM C 578-95; comparative crawl space fire tests; and a quality control manual.

4.0 FINDINGS

That the NOVA Chemicals Incorporated expandable polystyrene beads described in this report comply with the 1997 *Uniform Building Code*™ (UBC), the 2000 *International Building Code*® (IBC) and the 2000 *International Residential Code*® (IRC), subject to the following conditions:

- 4.1 **The maximum density and thickness of the expanded beads are as noted in this report.**
- 4.2 **Use of the beads is limited to products recognized in an ICBO ES evaluation report.**

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4.3 Except as noted in Section 2.2.2 of this report, the insulation boards produced from the NOVA Chemicals Incorporated beads are separated from the building interior by a thermal barrier complying with Section 2602.4 of the UBC, Section 2603.4 of the IBC or Section R 318.1.2 of the IRC.

4.4 The beads are produced by NOVA Chemicals Incorporated in Monaca, Pennsylvania, or Painesville, Ohio, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

This report is subject to re-examination in two years.

TABLE 1—NOVA CHEMICALS, INC., BEADS

EPS TYPE	NOMINAL DENSITY (pcf)	MAXIMUM THICKNESS (inches)			
		33M	35M	M77	M97
I	1.0	5	5	6	6
VIII	1.25	5	5	-	-
II	1.5	6	6	6	6
IX	2.0	5	5	6	6

For SI: 1 pcf = 16.018 kg/m³, 1 inch = 25.4 mm.



BRYX.R10302

Foamed Plastic

See. General information for Foamed Plastic

STYROCHEM U S LTD

R1 0302

3607 N SYLVANIA
 FT WORTH, TX 761 1 1 USA

Foamed Plastic in the form of boards.

EPS MA500, MA550, MA590, MB500, MB550, MB590, MBC590, MBT500, MBT590, MC280, MC500, MC550, MC590 or MOD.O.

	All Thkns Up to & Including 6 In. +
Flame spread	5#
Smoke developed	145#

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 1.00 lb. per cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 45 and smoke developed index of over 500.

All designations may be followed by suffixes in the form of numbers or letters for tracking purposes.

EPS MA500, MA550, MA590, MB500, MB550, MB590, MBC590, MBT500, MBT590, MC280, MC500, MC550, MC590 or MOD.O.

	All Thkns Up to & Including 6 In. +
Flame spread	5#
Smoke developed	200#

+Installed in a thickness or stored in an effective thickness, as indicated, for a density of 1.00-2.00 lb.

per cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 135 and smoke developed index of over 500.

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Filing Category: INSULATION

STYROCHEM EXPANDABLE POLYSTYRENE BEADS

STYROCHEM U.S., LTD.
11591 BUSINESS HIGHWAY 287 NORTH
FORT WORTH, TEXAS 76179

1.0 SUBJECT

StyroChem Expandable Polystyrene Beads.

2.0 DESCRIPTION

2.1 General:

StyroChem expandable polystyrene bead types MC-280, MA-500, MB-500, MC-500, MA-550, MB-550, MC-550; MA-590, MB-590, and MC-590 are used by independent manufacturers to produce expanded polystyrene (EPS) foam plastic boards. The boards are produced by introducing steam into a heating chamber containing the unexpanded beads. This process expands the beads, which are then molded into insulation products. The end use of the expandable polystyrene beads, including the manufacture of boards, is not a part of this report.

Products manufactured with the StyroChem beads and having a maximum density of 2 pcf (31.8 kg/m³) and a maximum thickness of 6 inches (152 mm) have a flame-spread rating not exceeding 25 and a smoke-developed rating not exceeding 450 when tested in accordance with UBC Standard 8-1.

Grades MA-500, MB-500, MB-550, MB-590, MC-500 and MC-590 expandable beads can be used to produce expanded polystyrene products that comply with Types I, II, VIII, and IX of ASTM C 578-95, provided the final product is recognized in a current ICBO ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of the ICBO ES Acceptance Criteria for Foam Plastic Insulation (AC12).

2.2 Installation:

2.2.1 General: The foam plastic products produced from StyroChem beads must be installed in accordance with their individual ICBO ES evaluation reports and the codes listed in Section 4.0 of this report.

2.2.2 Special Use: The foam plastic boards produced from the StyroChem beads can be used on walls in attics and crawl spaces with no covering applied to the attic or crawl space side of the foam plastic, provided the following conditions are met:

1. Entry to the attic or crawl space is only to service utilities, and heat-producing appliances are not permitted.
2. There are no interconnected attic or basement areas.
3. Air in the attic or crawl space is not circulated to other parts of the building.

4. Attic ventilation is provided in accordance with 1997 *Uniform Building Code*™ (UBC) Section 1505, 2000 *International Building Code*® (IBC) Section 1202.2, or 2000 *International Residential Code*® (IRC) Section R806.
5. Under-floor ventilation is provided in accordance with UBC Section 2317.7, IBC Section 1202.3, or IRC Section R406.
6. Boards have a maximum density and thickness of 1.0 pcf (16.0 kg/m³) and 4 inches (102 mm), respectively.
7. Boards have a maximum density and thickness of 2.0 pcf (32.0 kg/m³) and 2 inches (51 mm), respectively.
8. Boards have a maximum density and thickness of 1.5 pcf (24.0 kg/m³) and 2.6 inches (66 mm), respectively.

2.3 Identification:

Each expandable polystyrene bead container bears the StyroChem U.S., Ltd., name and address; bead identification; the label of the quality control agency, Underwriters Laboratories Inc.; and the evaluation report number (ICBO ES ER-5687 or NER-238).

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with UBC Standard 8-1 (ASTM E 84) and ASTM C 578-95, and a quality control manual.

4.0 FINDINGS

That the StyroChem Expandable Polystyrene Beads described in this report comply with the 1997 *Uniform Building Code*™ (UBC), the 2000 *International Building Code*® (IBC) and the 2000 *International Residential Code*® (IRC), subject to the following conditions:

- 4.1 The maximum density and thickness of products produced from the beads are as noted in this report.**
- 4.2 The products manufactured from the beads are recognized in a separate ICBO ES evaluation report.**
- 4.3 Except as noted in Section 2.2.2 of this report, the insulation boards produced from the Styrochem beads are separated from the building interior by a thermal barrier complying with Section 2602.4 of the UBC, Section 2603.4 of the IBC or Section 318.1.2 of the IRC.**
- 4.4 The EPS beads are manufactured at the StyroChem U.S., Ltd., facilities located in Fort Worth, Texas, in Saginaw, Texas, and in Baie d'Urfe, Quebec, Canada, under a quality control program with inspections conducted by Underwriters Laboratories Inc. (AA-668).**

This report is subject to re-examination in two years.

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BRYX.R18327 Foamed Plastic

[Bottom](#)

[Print-friendly version](#)

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[\[Previous Page](#)

Foamed Plastic

See **General Information for Foamed Plastic**

KOREA KUMHO PETROCHEMICAL CO LTD

R18327

KUMHO BLDG 57, 15TH & 16TH FL 57
SHINMMUNRO, 1-KA CHONGNO-KU
SEOUL 110-061, **KOREA**

Foamed plastic in the form of boards.

	6 In. Max+
Flame spread	15#
Smoke developed	165#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 1.50 Ibs per cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame spread index of 115 and smoke developed index of over 500.

	6 In. Max+
Flame spread	5#
Smoke developed	100#

+Installed in a thickness, or stored in an effective thickness, as indicated; for a density of 1.00 Ibs per cu ft.

#Flame spread and smoke developed recorded while material remained in the original test position. Ignition of molten residue on the furnace floor resulted in flame travel equivalent to calculated flame

spread index of 20 and smoke developed index of over 500.

Last Updated on 2004-12-06

[Page Top](#)

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[UL. Recognized
Components](#)

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Legacy report on the 1997 *Uniform Building Code*[™], the 2000 *International Building Code*[®] and the 2000 *International Residential Code*[®] (IRC)

DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07210—Building Insulation

STAREX POLYSTYRENE BEADS, SF SERIES

CHEIL INDUSTRIES INC. 62
PYONG YO-DONG YOSU-SI,
CHEON NAM 555-210 KOREA

1.0 SUBJECT

Starex Polystyrene Beads, SF Series.

2.0 DESCRIPTION

2.1 General:

Starex expandable polystyrene **SF Series** beads are used by independent manufacturers in manufacturing expanded polystyrene (EPS) insulation board. The end use of the polystyrene beads, including the manufacture of panels, is not part of this report.

Products manufactured with the Starex SF beads are produced solely through the introduction of heat, without other additives, and are provided in a variety of dimensions. Beads designated as Type I or Type II SF Series, when expanded to a minimum density of 0.90 pcf (14.4 kg/m³) for Type I beads and 1.35 pcf (21.6 kg/m³) for Type II beads at a maximum thickness of 6 inches (152 mm), provide a flame-spread rating of 25 or less and a smoke-developed rating not exceeding 450 when tested in accordance with UBC Standard 8-1 (ASTM E 84).

The expandable beads can be used to produce expanded polystyrene products that comply with ASTM C 578, provided the final product is recognized in a current ICC-ES evaluation report and has been qualified in accordance with Section 6.11.1.2 of the ICC-ES Acceptance Criteria for Foam Plastic Insulation (AC12).

2.2 Installation:

Installation is as noted in specific current ICC-ES evaluation reports on foam plastic assemblies.

2.3 Identification:

The bead containers bear a label indicating the component designation; the name and address of Cheil Industries Inc.; the lot number; the evaluation report number (ICBO ES ER-5624); and the logo of the inspection agency (Intertek Testing Services NA Inc.).

3.0 EVIDENCE SUBMITTED

Reports of tests in accordance with UBC Standard 8-1 (ASTM E 84) and ASTM C 578-95, and a quality control manual.

4.0 FINDINGS

That the Starex expandable polystyrene beads described in this report comply with the 1997 *Uniform Building Code*[™] (UBC), the 2000 *International Building Code*[®] (IBC) and the 2000 *International Residential Code*[®] (IRC), subject to the following conditions:

- 4.1 Products utilizing the beads must be recognized in an ICC-ES evaluation report as being in compliance with UBC Section 2602, IBC Section 2603 and IRC Section R318.
- 4.2 The maximum density and thickness of the board products from the expanded beads are as noted in this report.
- 4.3 Beads are produced in Yosu-Si, Cheon Nam, Korea, under a quality control program with inspections by Intertek Testing Services NA Inc. (AA-647).

This report is subject to re-examination in two years.

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