

# BOCA EVALUATION SERVICES, INC.

# BOCA RESEARCH REPORT NO. 96-1



TM

A Participating Member of the NES, Inc.



## DIVISION 07 - THERMAL AND MOISTURE PROTECTION SECTION 07250 - FIREPROOFING

### RETRO-GUARD RG AND MONOKOTE TYPE MK-6/HY and MK-6s FIREPROOFING

W. R. GRACE & CO. - CONN.  
62 WHITTEMORE AVENUE  
CAMBRIDGE, MA 02140-1692

#### 1.0 DESCRIPTION OF EVALUATION

This report evaluates the use of Retro-Guard and Monokote Type MK-6 Fireproofing, for use in noncombustible construction. The scope of the evaluation is a comparison of the heat release to that of gypsum drywall using a cone calorimeter.

#### 2.0 DESCRIPTION AND USE OF PRODUCT

Retro-Guard RG and Monokote MK-6/HY and MK-6s are cementitious fireproofing materials which are spray applied in the field. Type RG, MK-6/HY and MK-6s are single component, factory-mixed materials that require the addition of water at the jobsite to form a consistent, pumpable slurry, which is spray-applied to the substrate.

Type RG, MK-6/HY and MK-6s are intended for application to steel columns and beams, joists, trusses, concrete surfaces, fluted deck and flat plate cellular steel decking.

All flat plate cellular steel decking surfaces are to be primed with Spatterkote SK-3, a portland cement-based bond promoter, prior to application of Type RG, MK-6/HY, or MK-6s.

Monokote and Retro-Guard products are supplied in bags and mixed with 8 to 9 gallons (30 to 34 L) of water per 46 lbs. (21 kg) of material. Both products shall be applied promptly after mixing, prior to the material setting. Depending upon conditions, the material will set in 2-4 hours.

Monokote Accelerator is permitted to be added to either the Retro-Guard or Monokote products as a field application aid when shorter setting times are desired.

#### 3.0 CODE ANALYSIS OF SUBMITTED INFORMATION

The following data were submitted by the proponent for demonstration of compliance with the respective code sections listed above each item of information. The basis is the *BOCA National Building Code/1996*.

##### 3.1 NONCOMBUSTIBILITY (Equivalence to Gypsum Sheathing)

###### Code Section 704.4.1.2 Composite materials

###### Code Section 106.4 Alternative materials and equipment

##### INFORMATION SUBMITTED:

3.1.1 Underwriters Laboratories Inc., File R4339 Project No. 96NK0594, dated September 30, 1996.

3.1.2 Southwest Research Institute, Project No. 10-5218-013a, Revised Final Report, dated June 1993.

Types MK-6/HY, MK-6s, Retro-Guard RG and gypsum wallboard were tested in accordance with the cone calorimeter test ASTM E1354 to determine if the spray fireproofing material is equivalent in fire behavior to gypsum wallboard. Testing was performed in a horizontal orientation at a radiant heat flux of 75kW/m<sup>2</sup> with a spark ignition for a 600 second duration. Following testing the heat release rate and time to ignition values were compared to those for the gypsum wallboard. The values for the fireproofing material compared favorably to those for the gypsum wallboard.

3.1.3 Underwriters Laboratories Inc., File R4339, letter dated July 29, 1996, letter dated May 9, 1996, and letter dated September 14, 1989. Types MK-6/HY, MK-6s and Retro-Guard RG were tested in accordance with ASTM E84 and had surface flame spread and smoke-developed ratings of 0 and 0 respectively.

3.1.4 National Research Council Canada, File Reference 44-9320-B4503, dated Aug. 22, 1997, and File Reference No. A-4048.3, dated June 20, 1997.

Please contact BOCA Evaluation Services, Inc., with any questions you may have regarding this report. Additionally, please contact us if you have any information on the performance of the product described herein which is contrary to this report. This report is subject to the limitations listed herein and to the specific product, data and test reports submitted by the applicant requesting this report. Independent tests were not performed by BOCA Evaluation Services, Inc., and BOCA Evaluation Services, Inc., specifically does not make any warranty, either expressed or implied, as to any findings or other matter in this report or as to any product covered by this report. Evaluation reports are not to be construed as representing aesthetics or any other attributes not specifically addressed nor as an endorsement or recommendation for the use of the subject of the report. This disclaimer includes, but is not limited to, merchantability.

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The results of ISO 9705 Full Scale Room Corner Fire Tests comparing the performance of Monokote Type MK-6 to gypsum wallboard shows that Type MK-6 has a lower total heat release and less flame propagation than gypsum wallboard.

These test methods were used as a way to evaluate the performance characteristics of Retro-Guard and Monokote fireproofing as an alternative to gypsum sheathing, which is specifically permitted by the 1996 edition of the *BOCA National Building Code* to be used in noncombustible construction.

#### 4.0 INSTRUCTIONS TO THE CODE OFFICIAL

Monokote Type MK-6/HY, MK-6s and Retro-Guard RG have been evaluated for compliance with the 1996 editions of the *BOCA National Codes*. This report is limited to the application and products as stated herein. This evaluation is based solely upon information provided to BOCA Evaluation Services, Inc., by W. R. Grace & Co. - Conn. and has not been independently verified. BOCA-ES intends that the report be used by the code official to determine if these products comply with the code requirements specifically addressed in Section 3.0 of this report, when these products are installed in accordance with the following limitations:

##### Limitations

- 4.1 This report is subject to annual certification. Reports that are not certified shall not be used or referred to. In order to determine the status of certification of this report, contact BOCA Evaluation Services, Inc., or consult the latest edition of the *National Product Evaluation Listing* published periodically in the BOCA magazine.
- 4.2 Prior to the application of Monokote MK-6/HY, MK-6s, and Retro-Guard RG fireproofing, all flat plate cellular deck surfaces shall be primed with W.R. Grace Type SK-3 cementitious material.
- 4.3 The minimum thickness and density requirements shall be as specified in the applicable approved fire-resistance rated assemblies, tested in accordance with ASTM E119 by an approved testing agency. Evaluation of such tested assemblies is outside the scope of this report.
- 4.4 All containers of Retro-Guard RG, Monokote Type MK-6/HY and MK-6s fireproofing material shall bear the label of Underwriters Laboratories Inc.
- 4.5 Manufacturer's application instructions consistent with this research report shall be supplied to the code official as a portion of the construction documents and shall be available on site during all application stages. When manufacturer's installation instructions conflict with this report, this report shall be null and void.
- 4.6 Special Inspections shall be required for all applications of Monokote and Retro-Guard, in accordance with Section 1705.12 of the *BOCA National Building Code/1996*.

#### 5.0 INFORMATION REQUIRED ON CONSTRUCTION

#### DOCUMENTS

To aid in the use of this report, the following represents the minimum level of information to be reflected on construction documents in order to determine compliance with this research report.

- 5.1 All plans submitted specifying Monokote Type MK-6 or Retro-Guard shall reference the applicable tested assemblies and the required thicknesses of the fireproofing.
- 5.2 Detailed application instructions in accordance with ASTM E 1513-93 shall be provided.
- 5.3 The language "See BOCA Evaluation Services, Inc., Research Report No. 96-1."
- 5.4 A statement of special inspections prepared by the registered design professional in responsible charge, in accordance with Section 1705.1.1 of the *BOCA National Building Code/1996*.

#### 6.0 IDENTIFICATION

W. R. Grace & Co. - Conn. Monokote and Retro-Guard manufactured in accordance with this research report shall carry markings on each bag with the manufacturer's name, product designation and the identifying language, "See BOCA Evaluation Services, Inc. Research Report No. 96-1."

All containers of ingredients for Retro-Guard RG, Monokote Type MK-6/HY, and MK-6s fireproofing material shall bear the label of Underwriters Laboratories Inc.