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MECHANICAL ENGINEERING DIVISION
PITTSBURGH OFFICE - 3 WPH

H & S
Industrial Hygiene

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AUG 17 1983

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EDS 1983 AUGUST 12

PLAINTIFF'S
EXHIBIT

AL-787

RE: POT CRADLE WEDGE TO POTSHELL INSULATION

The wedge cradle design has been used at Massena (P-225), Alumax, Noranda, and Sao Luis. A thin insulating sheet is placed between the cradle wedge and the potshell to provide a parting plane when the wedge is pulled for shell removal. The original material specification for Massena was UNARCO Style 709 graphited asbestos cloth, asbestos for temperature resistance and graphite to aid in parting.

As part of our corporate attempt to eliminate asbestos bearing materials, Massena revised this insulation to uncoated fiberglass. Sometime later, Massena began dipping the fiberglass cloth in a mixture of powdered graphite. Alumax used the UNARCO material; Noranda used a Tetraglas graphited fiberglass. Sao Luis used a Brazilian graphited fiberglass.

In 1982, Massena discovered potshell corrosion of 1/16 to 3/32" in the wedge contact area where uncoated fiberglass cloth was used. Investigation showed no substantial corrosion where asbestos or graphite coated fiberglass were used. Investigation by ATC has shown:

1. Corrosion is caused by silicon and magnesium penetration from the fiberglass to the steel at elevated temperature. This area of the shell is at 410° to 465°C because of the graphite window in the side lining.
2. Corrosion will not occur at lower temperatures. For example, there is no corrosion caused by fiberglass insulation between the bottom of the potshell and the top of the cradles.
3. Graphite promotes heat transfer away from the wedge area, which effectively eliminates the corrosion problem.
4. Corrosion is limited by the quantity of silicon and magnesium in the cloth. That means that after 1/16 - 3/32" of corrosion occurs, the reaction will stop until a new piece of insulation is installed.
5. Based on ATC testing, Pyrotek's H10B is superior to dipped fiberglass and Tetraglas in resisting corrosion. H10B is a graphite impregnated, modified fiberglass fabric. It has been stripped of sodium oxide and magnesium oxide to improve temperature rating, which may also reduce the corrosion reaction. Attached is a product data sheet for H10B. It cost \$3.00/per square foot and must be cut to size and bound to prevent ravelling

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Recommendations

We recommend that Pyrotek H10B be used in this application for all future replacements.

- Massena - already using H10B for all new replacements.
- Alumar - should use H10B as an asbestos substitute
- Noranda - may see minor corrosion from Tetraglas (based on our lab tests). Problem does not appear to warrant changing insulation at this time. H10B is recommended when pots are relined.
- Sao Luis - Should be aware of this problem, and may wish to have Brazilian material tested at ATC as an indicator of probable performance.


Dr. R. Peinecke

DRP:ejr

Attachments

DISTRIBUTION:

R. C. McCormack - 20 AB
J. L. McKinstry - Sao Paulo
D. E. Jackson - Massena

cc: R. H. Lockhart/J. P. Carroll/S. J. Lindsay - Massena
R. L. Horst/A. Hafeez - ATC-C
E. E. Rumberger - 6 AB
A. R. Hendrie/J. R. Butler - Pt. Henry
A. G. Rust/K. A. Isakson/L. R. Begoon/D. N. Harvey/File#3 - C9
(Cradles)- 3 WPH
P. T. Carson/J. W. Cobes - 3 WPH

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**ASBESTOS
SUBSTITUTES**
product data sheet

Product: H-10B FIBERGLASS FABRIC

Color: BLACK

Normally Stocked As: Rolls 50" x 100 yds (1270mm x 30m)

Temperature Limitations:

Short Periods: 2000°F (1100°C)

Continuous Use: 1800°F (990°C)

Thickness Availabilities: .050" (1.3mm)

Density Availabilities: 40 oz/sq.yd (1020g/sqM)

Typical Uses: Weld shields, curtains, covers
for high temperature gaskets.

Notes: High temperature abrasion resistant
cloth is ideal for cover, weld pads,
and high temperature compressible
gaskets.

Pyrotek
INCORPORATED

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