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ENGLISH

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# FORMULA 3-P

Formerly Formula Patch

**Thermbond Refractories use the patented Stellar Binder System™ for easy and accurate mixing, controlled setting, fast dry-out and heat up, thermal shock resistance and other unique properties. Thermbond chemically bonds to existing fired refractories. CHARACTERISTICS: - Alumina - Silica - Mullite - Dense - Fine Grain - Non-Wetting - Fast Setting - Fast Curing**

| PACKAGING            |                      |                      |
|----------------------|----------------------|----------------------|
| Unit Equivalent      | Bags: 1              | Jugs: 1              |
| Bag Weight*          | 51 lbs               | 23.1 kg              |
| Jug Weight*          | 8 lbs                | 3.6 kg               |
| Drum Weight*         | 400 lbs              | 181.4 kg             |
| Unit Weight*         | 59 lbs               | 26.6 kg              |
| Yield / Unit*        | 0.40 ft <sup>3</sup> | 0.011 m <sup>3</sup> |
| Units / Ton*         | 34.13 short          | 37.62 metric         |
| Board Feet / Unit*   | 4.8 bd ft            |                      |
| Wet to Dry Ratio*    | 14.9% - 16.4%        |                      |
| Liquid Activator     | FORMULA              |                      |
| Bags Per Pallet      | 48                   |                      |
| Drums Per Dry Pallet | 1                    |                      |

| APPLICATION***        |                        |
|-----------------------|------------------------|
| Data based on         | Casting                |
| Alternative Method*** | Hand Packing Troweling |

| BULK DENSITY**     |                         |                        |
|--------------------|-------------------------|------------------------|
| As Placed          | 148 lbs/ft <sup>3</sup> | 2371 kg/m <sup>3</sup> |
| After 1500F (816C) | 140 lbs/ft <sup>3</sup> | 2243 kg/m <sup>3</sup> |

| MAXIMUM RECOMMENDED SERVICE TEMP** |        |        |
|------------------------------------|--------|--------|
| Hot Face                           | 3000 F | 1649 C |

| ABRASION RESISTANCE** (ASTM C-704) |             |
|------------------------------------|-------------|
| After 1500F (816C)                 | <20 cc loss |

| COMPRESSIVE STRENGTH** |           |                        |                      |
|------------------------|-----------|------------------------|----------------------|
| 1500F (816C)           | 4000 psi  | 281 kg/cm <sup>2</sup> | 28 N/mm <sup>2</sup> |
| 2000F (1093C)          | 8000 psi  | 562 kg/cm <sup>2</sup> | 55 N/mm <sup>2</sup> |
| 2500F (1371C)          | 11750 psi | 826 kg/cm <sup>2</sup> | 81 N/mm <sup>2</sup> |

| PERMANENT LINEAR CHANGE** |       |
|---------------------------|-------|
| 1500F (816C)              | 0.03% |
| 2000F (1093C)             | 0.06% |
| 2500F (1371C)             | 0.07% |

| TYPICAL CHEMICAL ANALYSIS (After 1500F (816C))** |         |
|--|---------|
| Al <sub>2</sub> O <sub>3</sub>                   | 59.61%  |
| SiO <sub>2</sub>                                 | 28.39%  |
| Fe <sub>2</sub> O <sub>3</sub>                   | 0.93%   |
| P <sub>2</sub> O <sub>5</sub>                    | 5.98%   |
| Other  | 5.08%   |
| Total  | 100.00% |

| THERMAL CONDUCTIVITY** |                                   |            |
|------------------------|-----------------------------------|------------|
| 600F (316C)            | 8.5 Btu-in/hr-ft <sup>2</sup> -F  | 1.23 W/m K |
| 1200F (649C)           | 9.1 Btu-in/hr-ft <sup>2</sup> -F  | 1.31 W/m K |
| 1800F (982C)           | 9.5 Btu-in/hr-ft <sup>2</sup> -F  | 1.37 W/m K |
| 2400F (1316C)          | 10.1 Btu-in/hr-ft <sup>2</sup> -F | 1.45 W/m K |

| COLD MODULUS OF RUPTURE** |          |                        |                      |
|---------------------------|----------|------------------------|----------------------|
| 1500F (816C)              | 900 psi  | 63 kg/cm <sup>2</sup>  | 6 N/mm <sup>2</sup>  |
| 2000F (1093C)             | 1750 psi | 123 kg/cm <sup>2</sup> | 12 N/mm <sup>2</sup> |
| 2500F (1371C)             | 2600 psi | 183 kg/cm <sup>2</sup> | 18 N/mm <sup>2</sup> |

| HOT MODULUS OF RUPTURE** |          |                        |                      |
|--------------------------|----------|------------------------|----------------------|
| 1500F (816C)             | 2100 psi | 148 kg/cm <sup>2</sup> | 14 N/mm <sup>2</sup> |

\*Measures are approximate and may vary. For mixing partial units, contact Stellar Materials for specific wet-to-dry ratios. See Installation Guide for more detailed information.

\*\*Test data shown are based on averages subject to normal variation on individual tests, and therefore should not be assumed to be maximum or minimum specifications.

Due to the unique nature of the Stellar binder system, test procedures vary slightly from ASTM. Documentation of these variations is available upon request.

\*\*\*Application by alternative method may produce somewhat different results.

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