

# RANKIN



## VERSAlloy® Diamond Carbide



Rankin Protective Metal Alloys (PMA) VERSAlloy® Diamond Carbide nickel matrix hardfacing rods are the top choice for fighting extreme abrasion erosion combined with impact and heat in industrial environments.

Rankin PMA hardfacing rods are designed to increase operating efficiency and extend part service life in oil and gas downhill drilling, pulp and paper, geothermal, agriculture, construction, mining and aggregate, tunnel boring, plastics, coring, hazmat, and utilities. PMA VERSAlloy Diamond Carbide offers maximum resistance to corrosion and high temperature, and provides superior wear when applied to drill pipe stabilizers, fishing tools, drill bits, rock bits, pulp knives, valves, brush hog blades, ripper teeth, mill hammers, rotary cutter heads, feed screws, air blast drills, boring augers, and pumps and impellers.

PMA's manufacturing process provides the highest quality of nickel alloy and allows the addition of a variety of sizes and ratios of tungsten carbide. Alloys can be custom blended to match specific operating conditions.

For more information call **800.845.7259**, visit **broco-rankin.com**, and email us at **sales@rankin.com**.

### Protective Metal Alloys VERSAlloy® Diamond Carbide Hardfacing Rods

- Longer lasting parts
- Improved equipment efficiencies
- Lower operating and maintenance costs
- High purity – no binders
- 100% deposition efficiency
- Easy to use
- No flux needed

**Rankin Protective Metal Alloys VERSAlloy® Diamond Carbide** hardfacing rods can be manufactured to a Rockwell hardness of 40, 50, or 60 nickel matrix made of nickel, chromium, and boron powder, and are combined with special blends of crushed, cast, pellets, spherical or macrocrystalline tungsten carbides.

**Diamond Carbide F Grade is a VERSAlloy®** nickel matrix rod with tungsten carbide pellets and finely powdered cast tungsten carbide to toughen the matrix and improve wear resistance.

**Diamond Carbide 40 100 is a VERSAlloy®** nickel matrix composite rod with a diameter up to 7/16" with larger crushed sintered tungsten carbide, up to 1/4" x 5/16".

**Diamond Carbide V Grade is a VERSAlloy®** nickel matrix rod with a blend of crushed sintered tungsten carbide.

**Diamond Carbide VSP Grade is a VERSAlloy®** nickel matrix rod with a mixture of crushed sintered tungsten carbide and spherical tungsten carbides.

**Diamond Carbide S Grade is a VERSAlloy®** nickel matrix rod with a higher percentage of macrocrystalline tungsten carbide for added wear resistance.

## Diamond Carbide Technical Data

### Diamond Carbide 60

Uses VERSAlloy 60 as the nickel matrix and macrocrystalline tungsten carbide for low impact applications

| Matrix                               | Rockwell "C" Scale | Nominal Chemistry |      |    |      | Melting Temp °F |
|--------------------------------------|--------------------|-------------------|------|----|------|-----------------|
| VERSAlloy® 60<br>AWS A5.13<br>NiCr-A | 57 - 61            | C                 | 0.74 | B  | 3.50 | 1900            |
|                                      |                    | Cr                | 14.0 | Fe | 4.50 |                 |
|                                      |                    | Si                | 4.55 | Ni | Bal  |                 |

### Diamond Carbide 50

Uses VERSAlloy 50 as the nickel matrix and macrocrystalline tungsten carbide for medium impact applications

| Matrix                               | Rockwell "C" Scale | Nominal Chemistry |      |    |     | Melting Temp °F |
|--------------------------------------|--------------------|-------------------|------|----|-----|-----------------|
| VERSAlloy® 50<br>AWS A5.13<br>NiCr-B | 48 - 52            | C                 | 0.60 | B  | 3.0 | 1950            |
|                                      |                    | Cr                | 11.0 | Fe | 4.0 |                 |
|                                      |                    | Si                | 4.0  | Ni | Bal |                 |

### Diamond Carbide 40

Uses VERSAlloy 40 as the nickel matrix and macrocrystalline tungsten carbide for high impact applications

| Matrix                               | Rockwell "C" Scale | Nominal Chemistry |      |    |      | Melting Temp °F |
|--------------------------------------|--------------------|-------------------|------|----|------|-----------------|
| VERSAlloy® 40<br>AWS A5.13<br>NiCr-A | 38 - 42            | C                 | 0.45 | B  | 2.25 | 2000            |
|                                      |                    | Cr                | 11.0 | Fe | 2.25 |                 |
|                                      |                    | Si                | 2.25 | Ni | Bal  |                 |

Rankin PMA VERSAlloy Diamond Carbide hardfacing rods are available in 18" lengths with diameters of 3/32", 1/8", 5/32", 3/16", 1/4", 5/16", and 7/16". Custom powder conversions and custom formulations are available upon request.

### Rankin PMA VERSAlloy® Diamond Carbide Application Process Procedures

For Oxyacetylene Welding (OAW): Thoroughly clean then preheat the base metal. Minimum dilution processes are recommended to obtain maximum wear resistance. Use a neutral flame to preheat the base metal to a 'sweat'. Do not melt the base metal. Introduce the VERSAlloy Diamond Carbide rod tip into the flame. The alloy will flow freely. Manipulate to cover the desired area. Fluidity of the composite rod will vary considerably based on the size and percentage of tungsten carbide in the rod.

Call Rankin Protective Metal Alloys at 800.845.7259 with questions and for special order information.



*Diamond Carbide for Superior Wear Resistance*

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