

WELDING RODS

CARBIDE-FILLED HARDFACING RODS

TECHNICAL DATA

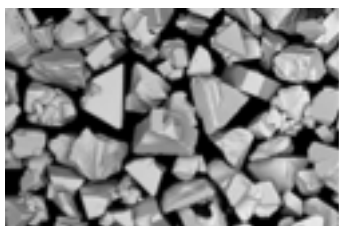
PRODUCT DESCRIPTION

Kennametal is a leader in carbide hardfacing rods for wear applications where solid carbide parts are impractical because of cost, design or both. Our hardfacing deposits are extremely wear- and abrasion-resistant, leading to a significant increase in service life while reducing costly downtime and labor.

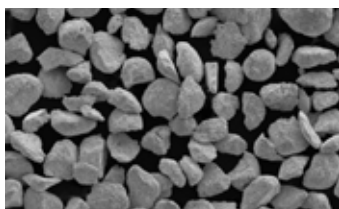
Our rods are manufactured using a wide variety of carbide fill types with superior physical and chemical carbide uniformity, uniform granule distribution, and a high level of carbide particle deposition.



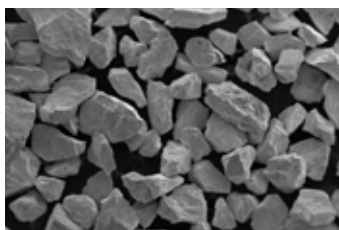
KENNAMETAL'S PRIMARY HARDFACING CONSTITUENT IS TUNGSTEN CARBIDE. THIS MATERIAL COMES IN A VARIETY OF FORMS, AND EACH HAS ITS OWN UNIQUE PROPERTIES.



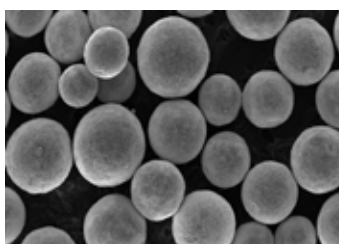
Macrocrystalline Tungsten Carbide (WCx) – Produced by a proprietary high-temperature aluminothermic reaction, Kennametal's Macrocrystalline Tungsten Carbide is one of the most thermodynamically stable forms of WC. The material features a highly uniform and pure monocarbide crystal with a uniform 6.13% carbon, yielding a stable carbide that has excellent wettability and excellent wear resistance.



Kenface™ Cemented Tungsten Carbide (WC-Co) – Kenface Cemented Tungsten Carbide is produced from high-quality material feeds which are low in Ti, Ta, and Nb. This material has excellent hardness, abrasion resistance, and is easily wettable.



Cast Tungsten Carbide (WCc) – Kennametal provides tungsten carbide powder by the high-temperature reaction of tungsten and carbon via a casting process. The material features a two-phase eutectic composition containing carbides of both tungsten carbide monocarbide (WC) and ditungsten carbide (W₂C). The result is one of the hardest and most abrasion-resistant materials.



Spherical Tungsten Carbide Pellets – Kennametal produces tungsten carbide pellets by milling together tungsten carbide, cobalt, and paraffin wax. The resulting material is then gradually fed into a rotating pan pelletizer. The rolling action of the powder causes the material to form pellets. Once the pellets are at the proper size, they are then sintered, crushed, and screened. The resulting pellets have excellent impact resistance and good wear resistance.

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HARDFACING RODS AND APPLICATIONS

KT150-6 – These hardfacing rods feature a fill of Macrocrystalline WCx and Kenface™ Cemented Tungsten Carbide (80/200 mesh) and are designed for SMAW welding processes. The resulting deposits feature a carbide fill of 60% for severe abrasion resistance in low impact applications. *Applications include: screens, screws, classifiers, slurry pumps, disc pulverizers, hammer mills, ball mill scoops, ore crusher liners, gudgeon pins, augers, scraper blades, muller plows.*

KT150-5 – Similar to the KT-150-6 rods, hardfacing rods feature a fill of Macrocrystalline WCx and Kenface Cemented Tungsten Carbide (80/200 mesh) and are designed for SMAW welding processes. The resulting deposits feature a carbide fill of 50% for severe abrasion resistance in moderate stress conditions. *Applications include: augers, scraper blades, feed screws, muller plows, heavy-duty tillage tools, earth-excavating wear parts, grinding equipment.*

KT80-6 – These hardfacing rods feature a fill of Macrocrystalline WCx and Kenface Cemented Tungsten Carbide (40/100 mesh) and are designed for OAW or GTAW welding processes. When two types of Kennametal carbide mix in the weld pool, one solution will harden the alloy while the other forms super-hard wear points. The resulting deposits feature a carbide fill of 60% for severe abrasion resistance in low impact applications. *Applications include: mixer blades, conveyer sprockets, impellers, tamping tools, pulverizer hammers, feed screws, mill guides, muller plows, crusher rolls, dozer blades, dragline buckets.*

KT80-5 – Similar to KT-80-6 rods, these hardfacing rods feature a fill of Macrocrystalline WCx and Kenface Cemented Tungsten Carbide (40/100 mesh) and are designed for OAW or GTAW welding processes. When two types of Kennametal carbide mix in the weld pool, one solution will harden the alloy while the other forms super-hard wear points. The resulting deposits feature a carbide fill of 50% for severe abrasion resistance and moderate impact applications. *Applications include: mixer blades, conveyer sprockets, impellers, pulverizer hammers, feed screws, mill guides, muller plows, crusher rolls, dozer blades, dragline buckets.*

RDWC – The RDWC rods contain Macrocrystalline WCx particles (40/100 or 40/80 mesh). While the rods are made for OAW and GTAW processes, other welding processes can be used due to the thermal stability of the Macrocrystalline carbides. The rods deposit WC crystals (50%, 60%, or 70% carbide fill rates) in a hard steel matrix and can be used in applications requiring severe earth abrasion with moderate impact. *Applications include: drilling, milling, pulverizing, hammer mills.*

RDCC – These rods are filled with Cast Tungsten Carbide (WC/W2C), which allows for good deposit contouring. The resulting deposit has 60% carbide fill with excellent wear resistance and moderate impact resistance. *Applications include: drill string hardfacing, shredding hammers, tillage tools.*

RDKF – These rods are manufactured from Kennametal's Kenface recycled cemented carbides. Kenface is produced from high-quality material feed which is low in Ti, Ta, and Nb. These rods are excellent for cost-sensitive applications and produce a deposit that has excellent hardness, abrasion resistance, and good impact properties. *Applications include: mixer blades, feed screws, scraper blades, drill stings.*

RDPL – These rods are predominately filled with Kennametal's Spherical Tungsten Carbide Pellets, but are also available with a wide variety of additional fillers (i.e., Cast WC, Kenface, and/or Macrocrystalline WCx) and in a wide variety of mesh sizes. The rods are designed for applications with high impact and moderate abrasion conditions. *Applications include: drill string hardfacing, agricultural tooling, ditch cutters, drill bits.*

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TECHNICAL DATA

TYPICAL PHYSICAL PROPERTIES

Grade	Primary Filler	Typical Mesh Size(s)	Additional Filler(s)	Deposit Carbide Fill (%)	Application Method(s)	Diameter (in)	Length (in)
KT150-6	WCx	80x200	Kenface™ (WC-Co)	60%	SMAW	1/8, 5/32, 3/16, 1/4	14, 18
KT150-5	WCx	80x200	Kenface (WC-Co)	50%	SMAW	1/8, 5/32, 3/16, 1/4	14, 18
KT80-6	WCx	40x100	Kenface (WC-Co)	60%	OAW, GTAW, SMAW	1/8, 5/32, 3/16, 1/4	14, 18, 28
KT80-5	WCx	40x100	Kenface (WC-Co)	50%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	14, 18, 28
RDWC	WCx	40x100 or 40x80	—	60%	OAW, GTAW, SMAW	1/8, 5/32, 3/16, 1/4	14, 18, 28
RDCC	Cast WC	20x30, 30x40, or 14x24	—	60%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	14, 18, 28
RDKF	Kenface	20x40	—	68%	SMAW, OAW	1/8, 5/32, 3/16, 1/4	28
RDPL	Spherical Pellets	14x24	—	60%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	28
RDPL	Spherical Pellets	16x30	Cast WC, Kenface (WC-Co)	65%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	28
RDPL	Spherical Pellets	16x30	WCx, Cast WC, Kenface (WC-Co)	65%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	28
RDPL	Spherical Pellets	16x30	Cast WC, Spherical Pellets	70%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	28
RDPL	Spherical Pellets	16x40	Cast WC, Kenface (WC-Co)	66%	OAW, GTAW	1/8, 5/32, 3/16, 1/4	28

Hardfacing rods are available with or without flux coating, depending on your application. Kennametal hardfacing rods are also available in a wide variety of sizes, fills, mesh sizes, and lengths. Customized sizes and solutions are available upon request.

PACKAGING

Weld rods typically ship sealed in boxes. Shipping weights are dependant on rod diameter and length.

Kennametal manufactures sophisticated materials, solid carbide, alloy castings, and machined parts that resist wear, corrosion, and abrasion. Information provided in this document is intended only for general guidance about Kennametal products and is the best information in our possession at the time. Product users may request information about their individual use of our products, but Kennametal does not warrant or guarantee this information in any way. Selection and purchase of Kennametal products is the sole responsibility of the product user based on the suitability of each use. Kennametal cannot know or anticipate the many variables that affect individual product use, and individual performance may vary. For these reasons, Kennametal does not warrant or guarantee advice or information in this document, assumes no liability regarding the same, and expressly disclaims any warranty of any kind, including any warranty of fitness for a particular purpose, regarding the same.

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