

Lincoln Electric

KOBATEK® PRODUCTS



Coated Electrodes for
Maintenance and Repair
Welding

Flux-Cored and GMA
Welding Wires for
Hardfacing



Kobatek®
PROTECTIVE MAINTENANCE TECHNOLOGY



T.C.
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TÜRK PATENT [] ENSTİTÜSÜ

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KOBATEK Helps to Cut Spares and Repair Costs

Spares and Repair Costs - Wear Factors

Because wear exists wherever there is motion, nearly every industry encounters wear problems. Excessive wear causes billions of dollars to be lost annually through: unplanned downtime, repetitive replacement of costly parts, inordinate maintenance costs, lowered production efficiency and losses of sales due to poor product reliability.

KOBATEK repair and maintenance welding electrodes have been instrumental in reducing losses and increasing cost savings for companies in a number of diverse industries and applications. Companies use KOBATEK products to:

Reduce cost : Fewer man-hours for repair and maintenance jobs; minimized downtime and rejects; reduction in purchases of spare parts, energy and resources.

Prolong equipment time : Surfacing extends life 30-300%, depending upon application, as compared to that of a nonsurfaced part.

Reduce down-time : Save dismantling time and downtime due to replacement delays; minimizes re-fitting time, etc..

Reduce inventory of spare parts : There is no need to keep numerous spare parts when worn parts can be rebuilt.

There are basically two main areas where KOBATEK electrodes are used :

1 - The rebuilding of worn metal parts to their original dimensions. This is accomplished with build-up or with build-up and overlay welding.

2 - The protection of new metal parts against the loss of metal. Hardsurfacing overlay is used on both new and/or original parts where the parts are most susceptible to wear. The higher alloy overlay offers much better resistance than that of the original base material. This usually increases the work life of the component up to two or more times that of a part which is not surfaced.

With over 30 years experience in the field of repair and maintenance welding, KOBATEK can recommend and supply the most cost-effective solution to any repair-maintenance and welding problems. KOBATEK offers you a complete range of welding electrodes for every repair and preventative maintenance need. KOBATEK research teams are constantly seeking better methods of combating wear and welding problems; creating new products for new preventative maintenance and welding problems, and improving existing products for old problems. New products to match operating requirements in your plants can also be developed.

This part briefly outlines the KOBATEK product line which includes electrodes for: surface preparation, cast irons, steels, stainless steels, hardfacing, copper and aluminium alloys.

Wear is a general term used to describe a progressive deterioration of a surface with loss of shape, often accompanied by loss of weight due to the creation of debris. We have to understand the wear factors involved before making a hard surfacing product selection.

There are seven major types of wear which are caused by mechanical and chemical actions.

Mechanical causes of wear:

(1) abrasion, (2) impact, (3) erosion, (4) cavitation, (5) friction

Chemical causes of wear :

(6) corrosion and heat

ABRASION :

Abrasion is the most common form of wear. It is caused by foreign materials (non-metallic materials such as sand, oxides or grit) moving over a metal part. The worn surface can be recognized by its polished appearance or by very fine scratches in the direction of particle movement. It can be broken down into three main categories :

- 1 - Low-stress scratching abrasion: typical components subjected to this kind of abrasion include: agricultural implements, classifiers, screens, slurry pump nozzles, sand slingers and chutes, etc...
- 2 - High-stress grinding abrasion: typical components subjected to this kind of abrasion include: augers, scraper blades, pulverizers, ball and rod mills, miller tires, brake drums, roll crushers, rollers sprockets and mixing paddles etc...
- 3 - Gouging abrasion: typical components subjected to gouging abrasion include: dragline buckets, power shovel buckets, clam shell buckets, gyratory rock crushers, roll crushers and jaw crushers, etc...



IMPACT :

Wear by impact is the result of a succession of local shock loads on the material surface. When the stress exceeds the elastic limits of the metal, the metal deforms both beneath the point and laterally across the surface away from the impact point. Some of the effects of impact are: fatigue, cracking, flaking, compression and deformation. Typical components subjected to impact include: coupling boxes, crusher rolls, impact hammers, impactor bars, railroad frogs and crossings.

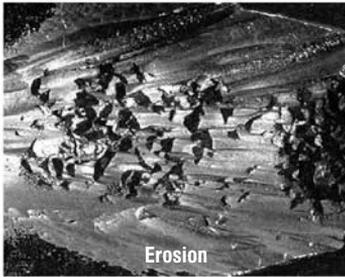
Wear Factors

Abrasion - Impact - Erosion - Cavitation - Corrosion - High Temperature - Friction

EROSION :

It occurs in liquid or gaseous media, when extraneous, fine and hard particles strike a surface at an angle of incidence. Erosion can be considered a combined form of impact and abrasion. Grit-blasting is a technological application of this phenomenon. Erosion wear involves two typical mechanisms:

- 1 - In cases of vertical impact we are dealing with local phenomena, which can lead to both elastic and plastic deformation, with grooves on the worn surface.
- 2 - In cases of oblique or glancing impact by solid particles, the mechanism of surface damage involves the formation of chips.



is to analyze the exact manner in which the mechanisms are interacting. This brief description of the main types of wear shows that a detailed theoretical evaluation of any given wear problem is highly complex. But you can easily find a solution with the appropriate special KOBATEK alloys.



HIGH TEMPERATURE:

Heat affects the metal's microstructure and generally reduces its durability. A major cause of metal failure from high temperature service is the thermal fatigue (fire cracking) that results from repetitive intense heating followed by cooling. The repeated expansion and contraction caused by this thermal cycling eventually exceeds the ability of the metal to recover and causes deep cracking. The most common form of wear caused by heat is probably oxidation. This takes place during the build-up of an oxide layer. Wear occurs when the layer is broken away by a cycle of expansion and contraction, and the whole oxidation operation is repeated. Typical components subjected to high temperature wear include: continuous caster rolls, steel mill work rolls, hot forging dies, tongs and sinter crushing equipment.

CAVITATION:

This wear results from the rapid formation and collapse of tiny gas bubbles in a liquid. This causes high speed localized pressure changes or explosions creating shock waves that impact on the base metal surface resulting in local deformation. The damage to the surface arises from a similar mechanism to that of erosion by impact deformation, except that in the case of cavitation the solid abrasive particles are replaced by microwaves that produce pitting fatigue, subsequent micro-cracks (fissures) and the removal of metal.

CORROSION :

It is deterioration of a metal by a chemical or electrochemical reaction between the metal and the environment such as scaling and pitting caused by oxidation when a metal is heated, or by acids eroding the base metal. The most common type of corrosion is rust. Rust transforms the surface of a metal into oxide which eventually flakes off, thus reducing the original thickness of the metal.

In most cases, several different types of wear work together, with a combined destructive effect which is often greater than the sum of their individual effects. To propose an effective solution to complex combined wear problems, one approach

ADHESION and FRICTION (Metal-to-Metal):

This wear results from the sliding or rolling contact of one metal surface against another. To the naked eye, metal surfaces may appear smooth and even highly polished, but under a microscope they show definite hills and valleys. As metal surfaces slide against each other, the high areas (hills) are broken and tiny fragments of metal are torn away. Typical components subjected to friction include: steel mill rolls, undercarriage components, shear blades, shafts, trunnions and non-lubricated bearing surfaces.



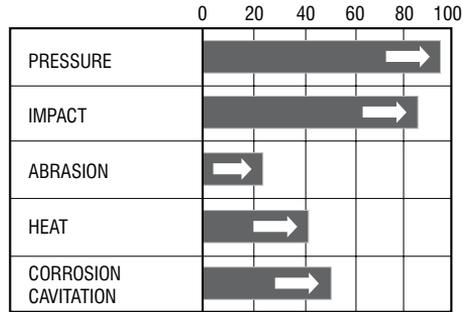
How to Select the Most Appropriate Product ?

Product Selection - Welding Methods

How to select the most appropriate KOBATEK product ?

The graphic system is a simple method which helps to eliminate guesswork and chance in the selection of the proper welding alloy for repair or wear protection applications. Each product data page contains a table designation.

These tables summarize the principal characteristics and properties of the deposited alloys. You can analyze their environmental factors encountered causing wear or repair, and make a similar table and compare your application's factors with the product's factors.



0 - 20 : Inferior
 21 - 40 : Fair
 41 - 60 : Good
 61 - 80 : Very good
 81 - 100 : Excellent

WELDING METHODS

In addition to the properties of its chemical elements, the properties of the weld filler metal is based on the following factors:

- 1 - Electrode diameter
- 2 - Arc length
- 3 - Preheating temperature
- 4 - Current and type of polarity
- 5 - Workpiece thickness

The last factor leads to two welding methods :

- 1 - Method-A
- 2 - Method-B

METHOD - A

High Current Operation

It is suitable for large and thick sectioned components. It enables high speed welding. This method is particularly used for assembly and machine parts where pieces are removed from the surface and for multipass filler welding applications.

METHOD - B

Low Current Operation

It is used to eliminate the overheating of small and thin sectioned components. It also provides a protective layer in the weld metal due to the limited melting of the base metal. Minimum fluidity and liquidification is obtained on the base metal.

Coated Electrode for Surface Preparation, Cutting and Gouging

General Description

Kobatek 111 is used for ferrous or non-ferrous metals where grooving is necessary without supplementary gases and special electrode holder. For preparing sections prior to welding, gouging out old or defective weld metal, removing flash and risers. All these operations can be carried out in all positions; except vertical upwards. A thick, specially developed exothermic coating produces a forceful gas jet which blows the molten metal away, to give a smooth, clean groove. A finishing operation is unnecessary.

Working Speed	██████████	██████████	██████████	██████████
Cleaning	██████████	██████████	██████████	██████████
Heat Input	██████████	██████████	██████████	██████████

RECOMMENDED PROCEDURE :

Strike the arc with the electrode normal to the workpiece and then immediately incline the electrode at an angle of 15-20° to the workpiece. Point the arc in the direction of travel, move the electrode forward to melt the metal and then pull it back to allow the gas jet to blow the molten metal away.

Approvals

GOST, SEPRO, TSEK

Typical Applications

- Gouging, bevelling cast iron and other metals
- Removal of old welds and rivets
- Removal of weld defects
- Piercing holes
- Back-gouging root runs



Gouging and
Removal Weld Defects

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	180 - 220	5
4.00	350	200 - 275	5
5.00	350	250 - 300	5

Coated Electrode for Cast Irons

General Description

An AC/DC pure nickel electrode for welding of old, contaminated, oil-soaked gray and alloyed castings with a minimum preheat. The welding should proceed step by step so that the work-piece is not heated more than necessary. It has excellent application properties on welding in position. The deposit is always soft and machinable.

Crack Resistance	████████	████████	████████	████████
Bonding	████████	████████	████████	████████
Machinability	████████	████████	████████	████████

General Description

Tensile Strength : 26 - 30 kg/mm²
 Elongation (L=5d) : 8 - 10 %
 Hardness : 100 - 140 HB

Approvals

GOST, SEPRO, TSE

Typical Applications

- Engine blocks
- Pump housings
- Cylinder heads and blocks
- Valves
- Gear and gear boxes
- Eccentric wheels
- Work-bench sledges
- Drums
- Reclamation of faulty castings
- Joining of castings in all-cast and composite fabrications



Engine Blocks

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	300	70 - 90	50 - 60	1
3.25	300	100 - 120	80 - 90	1

Coated Electrode for Cast Irons

General Description

A pure nickel, non-conductive flux coating electrode for repair and maintenance welding of cast iron components. Kobatek 418 exhibits excellent arc characteristics by producing a drop arc transfer which assists in combating surface contamination such as when joining badly oiled cast iron parts. For all types of machinable repairs on old, contaminated, oil-soaked gray and alloyed castings. Sound, dense deposits are fully machinable. It can be used for thin, as well as thick sections.

Crack Resistance	██████████
Bonding	██████████
Machinability	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 26 - 30 kg/mm²
 Elongation (L=5d) : 8 - 10 %
 Hardness : 120 - 160 HB

Approvals

GOST, SEPRO

Typical Applications

- Pump housings
- Pump rotors
- Compressors
- Valves
- Gear boxes
- Engine blocks
- Cylinder heads and blocks
- Pulleys
- Eccentric wheels



Pump Housings

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	300	70 - 90	50 - 60	5
3.25	350	100 - 120	80 - 90	5
4.00	350	130 - 150	100 - 120	5

Coated Electrode for Cast Irons

General Description

Kobatek 458 has Ni-Cu alloyed deposit and it has been specially designed for welding of malleable cast iron and nodular or ductile spheroidal graphite iron where ease of welding, low heat input and high crack resistance are important. Therefore, it is very suitable for making thick joints and for filling up deep cavities. It has high crack resistant deposits which are fully machinable. It can be used on both heavy and thin sections, especially for welding in position. The special arc characteristics also allow welding even on contaminated surfaces. It is also suitable for joining cast iron to steel. The deposit is the optimum colour match with the cast iron parts.

Crack Resistance	██████████
Bonding	██████████
Machinability	██████████

Mechanical Properties, All Weld Metal

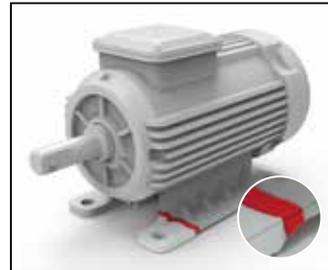
Tensile Strength : 38 - 44 kg/mm²
 Elongation (L=5d) : 15 - 20 %
 Hardness : 140 - 180 HB

Approvals

GOST, SEPRO

Typical Applications

- Repair of nodular and ductile iron castings and foundry defects
- Machine housings
- Pipes and flanges
- Pump impellers
- Pulleys
- Gears and gear boxes
- Turbine blades
- Engine blocks
- Transmission housings
- Joining of gray cast iron to steels and stainless steels
- Joining of steels to copper alloys



Repair Welding of Cast Irons
 Joining of Cast Irons to Steels

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	300	80 - 90	60 - 70	5
3.25	350	110 - 120	90 - 100	5
4.00	350	140 - 150	120 - 130	5

Coated Electrode for High Strength Low Alloyed Steels

General Description

Is a heavily coated basic electrode. It is suitable for joint welding applications of non-alloyed and medium carbon steels, fine grained steels such as St 70 and cast steels up to GS-70. The weld metal has a high resistance against hard and dynamic forces.

Especially it is ideal for multi pass welding connections, which has high strength and high impact properties, high creep resistance between -50 and $+350^{\circ}\text{C}$. Also provides low spatter, easy machinable and high resistant weld seams against hot crack formation.

Pressure	████████	████	████	████
Impact	████████	████████	████	████
Mechanical Strength	████████	████████	████	████
Heat	████████	████████	████	████
Machinability	████████	████████	████	████

Mechanical Properties, All Weld Metal

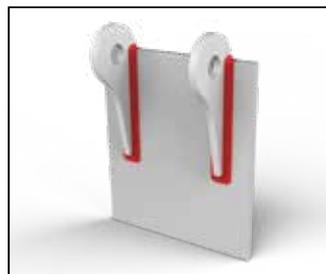
Tensile Strength	: 8 - 62 kg/mm ²
Yield Strength	: 50 - 55 kg/mm ²
Elongation (L=5d)	: 25 - 30 %
Hardness	: 210 - 230 HB
Impact (ISO-V)	: 190 J (+20°C) 80 J (-50°C)
Area Reduction	: 75 - 80 %

Approvals

GOST, SEPRO

Typical Applications

- Welding of rotary kilns in cement industry
- Joint welding on parts working up to 350°C
- Joining of parts with truck chassis on earth moving equipments
- Joint welding on press constructions
- Joint welding on mills and crushers
- Filling of cast steels and worn out machine parts
- Welding applications in cold environments



Joining of Heavy Sections

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	180 - 220	5
4.00	350	200 - 275	5
5.00	350	250 - 300	5

Coated Electrode for High Strength Low Alloyed Steels

General Description

Developed for welding of N-A-XTRA, yield strength up to 85 kg/mm² and for fine grained and high strength steels such as S690. It is also suitable for steels which have a tensile strength more than 90 kg/mm². Weld metal is low alloyed steel with Ni-Cr-Mo and is ideal for the applications, requiring both high toughness and crack resistance in cold environments down to -40°C.

The pre-heating operation is suggested before the welding of high strength steels and heat treated steels.

Kobatek 315 can also be used for multi pass welding applications. In this situation welding operation must be continuous and interpass temperature should be kept between 100-150°C.

Mechanical Strength	██████████
Crack Resistance	██████████
Heat	██████████

Mechanical Properties, All Weld Metal

Tensile Strength	: 90 - 95 kg/mm ²
Yield Strength	: 85 - 90 kg/mm ²
Elongation (L=5d)	: 20 %
Hardness	: 250 - 270 HB
Impact (ISO-V)	: 70 J (0 °C)
	60 J (- 20°C)
	50 J (- 40°C)

Typical Applications

- Platforms of earth moving equipment
- Welding of high strength and wear resistant steels such as Hardox and Weldox
- Repairing by welding of boom and several body cracks on earth moving equipment
- Cryogenic equipment production
- Welding of high strength and low alloyed heat treated steels
- Production of lifting cranes
- Production of machines, working under unsteady dynamic forces
- Applications of root pass welding on high strength construction steels



Platforms

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	100 - 150	5
4.00	350	130 - 190	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 326 has a very crack proof weld metal. It is suitable for the joining and welding of special steels used at both sub-zero and elevated temperatures, also recommended for 5-9 % nickel steels and nickel alloys such as Inconel 600, Incoloy 800, Nimonic 75, NiCr 80/20, NiCr 60/15, NiCr15Fe and dissimilar ferrous metal combinations, including stainless steel to steel.

Kobatek 326 provides the ultimate fatigue resistance for highly stressed constructions using thick sections. The weld metal has a good impact strength down to -196°C and a good tensile strength up to 1000°C . Also the corrosion and oxidation resistance are good.

Crack Resistance	
Bonding	
Machinability	

Mechanical Properties, All Weld Metal

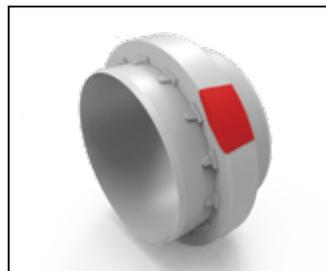
Tensile Strength : 66 - 71 kg/mm²
 Elongation (L=5d) : 40 - 44 %
 Hardness : 160 - 200 HB

Approvals

GOST, TSEK

Typical Applications

- Joining or repairing of heavily constrained massive sections
- Bearing rings of rotary kilns
- Walls of ball mills
- Ball mill driving gears, journals and collars
- Blast furnaces
- Flame hardening equipments
- Heat treating trays
- Pipe flanges
- Machine parts subject to thermal cycling and sub-zero temperatures such as cryogenic equipments
- Joining dissimilar combinations of steels



Bearing Rings of Rotary Kilns

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	250	80 - 90	60 - 80	2.5
3.25	300	100 - 110	70 - 100	5
4.00	350	120 - 140	100 - 110	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 326-N has a very crack proof weld metal. It is suitable for the joining and welding of special steels used at both sub-zero and elevated temperatures, also recommended for 5-9% nickel steels and nickel alloys such as Inconel 600, Incoloy 800, Nimonic 75, NiCr 80/20, NiCr 60/15, NiCr15Fe and dissimilar ferrous metal combinations, including stainless steel to steel.

Kobatek 326-N provides the ultimate fatigue resistance for highly stressed constructions using thick sections. The weld metal has a good impact strength down to -196°C and a good tensile strength up to 1000°C . Also the corrosion and oxidation resistance are good

Mechanical Strength	██████████
Crack Resistance	██████████
Heat	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 60 - 65 kg/mm²
 Yield Strength : 38 - 42 kg/mm²
 Elongation (L=5d) : 35 - 40 %
 Hardness : 140 - 180 HB

Approvals

GOST, TSEK

Typical Applications

- Joining or repairing of heavily constrained massive sections
- Walls of ball mills
- Bearing rings of rotary kilns
- Boom welding of earth moving equipments
- Machine parts subject to thermal cycling and sub-zero temperatures such as cryogenic equipments
- Heat treating trays
- Ball mill driving gears, journals and collars
- Blast furnaces
- Flame hardening equipments
- Pipe flanges
- Joining dissimilar combination of steels



Joining or Repair Welding of Massive Sections

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	300	140 - 160	90 - 110	5
4.00	350	160 - 200	120 - 150	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 328 is basic covered, Ni-base and CrMoNb alloyed austenitic type electrode suitable for all position welding except vertical down. It is especially ideal for joining and fillet welding of dissimilar metals, nickel alloys (Inconel 600, Incoloy 800, Hastelloy, Nichrome), up to 9% Ni-steels and copper alloys. It can be used for multiple pass welding of very thick sections. Kobatek 328 gives a fully austenitic crack free weld metal even under the dynamic stress. It has high resistance against high working temperature (up to 1200°C), oxidation, carburization, corrosion (general, intergranular, pitting and stress corrosion) and hot cracking. The weld metal has good impact value at cryogenic (down to -196°C) conditions. Because of its elongation value up to 45%, it can be used at high vibrated areas like vibrating screens.

Weldability	██████████
Mechanical Strength	██████████
Crack Resistance	██████████
Heat	██████████
Corrosion	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 75 - 77 kg/mm²
 Yield Strength : 49 - 51 kg/mm²
 Elongation (L=5d) : 42 - 44 %
 Impact (ISO-V) : 90 J (-196 °C)

Typical Applications

- Bearing rings and rollers of cement rotary kilns
- High vibration conditions like vibrating screens
- Machine parts subject to high thermal cycling and sub-zero temperatures such as cryogenic equipments
- Walls of ball mills and blast furnaces
- Ball mill driving gear, journal and collars
- Buffer layers applied to hot forging dies prior to hardfacing welding
- Joining dissimilar steels difficult to weld
- Joining and repairing of heavily constrained massive sections
- Booms of heavy construction equipment
- Body of die-casting moulds
- Heat exchangers



Ball Mill Heads

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC (+)

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Box Weight [kg]
2.50	300	50 - 70	5
3.25	300	70 - 100	5
4.00	350	100 - 130	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

A special electrode for welding steels having limited weldability, such as manganese steels, hardenable steels and others. It is an AC/DC electrode giving a non-magnetic and work hardenable stainless steel deposit containing Cr-Ni-Mn-Mo. The tough weld metal is able to absorb high welding stresses which is very important for achieving crack-free welds.

Pressure	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████
Abrasion	██████	██████	██████	██████	██████
Heat	██████	██████	██████	██████	██████
Corrosion/Cavitation	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

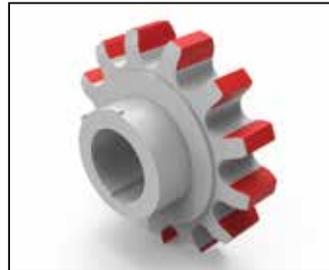
Tensile Strength : 58 - 64 kg/mm²
 Elongation (L=5d) : 38 - 42 %
 Hardness : 160 - 180 HB (as welded)
 400 - 420 HB (cold worked)

Approvals

GOST

Typical Applications

- Site machinery
- Drilling tools
- Rails, points
- Valve seats
- Earth moving equipments
- Stone working machines
- Coal machines
- Armoured cars
- Joining between X5 CrNiMo 18 10, X10 CrNiMoNb 18 10, HI-HIII, 17 Mn 4



Earth Moving Equipment

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	250	85 - 110	65 - 90	2.5
3.25	300	120 - 150	90 - 120	5
4.00	350	150 - 180	110 - 140	5
5.00	350	180 - 220	160 - 190	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 350 is a basic coated electrode used for welding martensitic and martensitic-ferritic type steels. It exhibits high corrosion resistance to water, vapor and salt water. A preheating of 100-200°C should be applied for thick sectioned parts. Interpass temperature should be constant.

Weld beads are smooth and the slag is easy to remove.

Pressure	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████
Abrasion	██████████	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████	██████████
Corrosion/Cavitation	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 90 - 110 kg/mm²
 Yield Strength : 70 - 80 kg/mm²
 Elongation (L=5d) : 10 - 15 %
 Hardness : 38 - 40 HRC
 Impact (ISO-V) : 24 J (+20 °C)

Approvals

GOST

Typical Applications

It is particularly used for the protection of 12-15% Cr, 4% Ni containing steels against corrosion.

- Water turbines and compressors
- Pelton, Francis turbine rotors
- Kaplan turbine blades
- Valves used in gas, vapor and water pipelines operating under service temperatures up to 450°C
- Erosive and corrosive attacks caused by sea water
- Welding of X4 CrNi 13 4 and G-X5 CrNi 13 4 (1.4343) steels.



Turbine Blades and Rotors

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	90 - 120	5
4.00	350	120 - 170	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 352 has a manganese alloyed stainless steel deposit containing Cr-Ni-Mn-Mo which is a work hardening alloy. It is used for build-up applications and cushion layers prior to harder overlays, and for a wide range of steel, low alloy steel and 12-14% austenitic manganese steel components subjected to severe impact combined with high pressure. Steel deposit will also resist a wide range of corrosive conditions and cavitation.

Deposits exhibit a smooth even shaped bead, high metal recovery rates and ease of slag removal. The electrode can be deposited in contact with the workpiece.

Pressure	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████
Abrasion	██████	██████	██████	██████	██████
Heat	██████	██████	██████	██████	██████
Corrosion/Cavitation	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

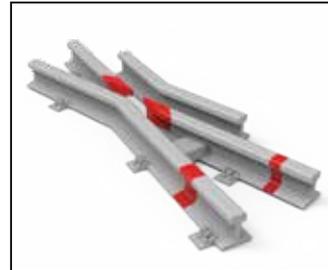
Tensile Strength : 64 - 66 kg/mm²
 Elongation (L=5d) : 40 - 44 %
 Hardness : 160 - 200 HB (as welded)
 400 - 440 HB (after work hardened)

Approvals

GOST, TSEK

Typical Applications

- Rail Pinch Bars
- Welding and repairing 12-14% manganese steels
- Crusher jaws
- Tractor sprocket tooth
- Guides and rollers on tracked vehicles
- Armour plates
- Perforated plating on ore-sorters
- Gyratory crusher cones
- Conveyor rollers
- Crusher cylinder hooks
- Dozer cutting edges
- Bucket lips and sides
- Impactors, hammers
- Joining austenitic manganese steels to carbon steels
- Stainless cladding carbon steels and low alloy steels



Rail Pinch Bars

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	350	140 - 160	100 - 160	5
4.00	350	210 - 240	140 - 190	5

Coated Electrode for High Strength Low Alloyed Steels

General Description

Kobatek 358 is a high manganese austenitic type Hatfield steel structure weld metal with improved ductility and toughness and also high compression and tensile strength. Especially is suitable for buffer layers prior to harder overlays, 12-14% manganese including steels, hardenable alloyed steels and steels with limited weldability.

Kobatek 358 is resistant against high loads of impact, pressure and low forced abrasion wearing. Becomes harder working under impact with cold deformation. Weld metal can be cut with flame (oxy-fuel) processes. Not suggested to be used temperatures over 250°C. Has not anti-corrosion properties.

Crack Resistance	██████████
Bonding	██████████
Machinability	██████████

Mechanical Properties, All Weld Metal

Compressive Strength :	170 kg/mm ²
Tensile Strength :	80 - 85 kg/mm ²
Yield Strength :	60 kg/mm ²
Elongation (L=5d) :	40 - 45 %
Hardness :	160 - 170 HB (as welded)
	400 - 425 HB (after work hardened)
Impact (ISO-V) :	125 J (-60°C)

Typical Applications

- Running Gear Parts
- Joining and welding operations of Mn-steels and joining of these steels with medium carbon steels and alloyed steels
- Armour plates
- Crushers and grinders working under impact and/or under pressure (crushers, crusher cones, crusher hammers) and including parts
- Mine, soil and earth moving equipment
- Machine parts working under impact (hammer drill)



Running Gear Parts

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	80 - 135	5
4.00	350	135 - 180	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

Kobatek 381 deposits a Cr-Ni-Mo based stainless steel weld metal. It is designed for welding large, high strength steel components requiring fast multi-layer deposits with crack resistance. It is ideal for repairing difficult-to-weld steels and for putting down buffer layers before filling up with hardenable deposits.

It can be used as a buffer layer on high manganese Hadfield steel and for surfacing where some resistance to impact and battering is required under corrosive conditions.

Mechanical Strength	██████████	██████████	██████████	██████████	██████████
Crack Resistance	██████████	██████████	██████████	██████████	██████████
Heat Input	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

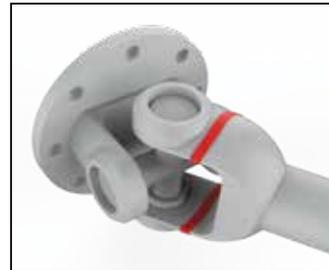
Tensile Strength : 76 - 82 kg/mm²
 Yield Strength : 58 - 62 kg/mm²
 Elongation (L=5d) : 20 - 25 %
 Hardness : 220 - 260 HB

Approvals

GOST, TSEK

Typical Applications

- Coupling Rolling Mill Extensions
- Press cylinders in plastic and food industries
- Earth moving equipments
- Hydraulic cylinders
- Injection moulds
- Extrusion screws
- Turbine blades
- Valve seats for superheated steam
- Heat exchangers
- Coal washing screens
- Wear plates
- Bucket tooth
- Dies, gears, shafts, tools



Coupling Rolling Mill Extensions

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	350	90 - 120	70 - 80	5
3.25	350	130 - 150	110 - 120	5
4.00	350	180 - 210	120 - 160	5

Coated Electrode for High Alloyed Special Steels Difficult to Weld

General Description

It is extremely high strength and crack-resistant when joining steels of difficult weldability, such as hard manganese steels, tool steels, spring steels as well as dissimilar metal joints. A highly alloyed manual metal arc electrode with good deposition qualities for the welding of air hardening steels, cementation steels, high carbon steels, V-Mo spring steels, stainless steels and any dissimilar combinations of these alloys.

Also ideal for the buffering of higher carbon and alloy steels prior to final hard overlays including 12-14% austenitic manganese steels. It gives workhardenable weld metal. The arc is stable and spatter-free.

Mechanical Strength	██████████	██████████	██████████	██████████	██████████
Crack Resistance	██████████	██████████	██████████	██████████	██████████
Heat Input	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 80 - 86 kg/mm²
 Yield Strength : 64 - 66 kg/mm²
 Elongation (L=5d) : 20 - 25 %
 Hardness : 220 - 260 HB

Approvals

GOST, TSEK

Typical Applications

- Cutting tools
- Gears, shafts and cams
- Forging dies
- Extrusion and hydraulic cylinders
- Vibration sieves
- Forming tools
- Earth moving parts
- Chassis frames
- Cushion pass for tool steels
- Joining stainless steels to carbon steels and low alloy steels
- Joining austenitic manganese steels to carbon steels and low alloy steels



Gears

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	250	60 - 80	40 - 50	2.5
3.25	350	90 - 100	60 - 80	5
4.00	350	125 - 150	90 - 120	5

Coated Electrode for Aluminium and its Alloys

General Description

Kobatek 381 deposits a Cr-Ni-Mo based stainless steel weld metal. It is designed for welding large, high strength steel components requiring fast multi-layer deposits with crack resistance. It is ideal for repairing difficult-to-weld steels and for putting down buffer layers before filling up with hardenable deposits.

It can be used as a buffer layer on high manganese Hadfield steel and for surfacing where some resistance to impact and battering is required under corrosive conditions.

Mechanical Strength	██████	██	██	██	██
Intensity of Humidity	██████	██	██	██	██
Weld Metal Quality	██████	██	██	██	██

Mechanical Properties, All Weld Metal

Tensile Strength : 14 - 16 kg/mm²
 Yield Strength : 8 - 10 kg/mm²
 Elongation (L=5d) : 15 - 18 %
 Hardness : 50 - 60 HB

Approvals

GOST, SEPRO

Typical Applications

- Truck bodies and conveyers
- Rails
- Floor plates
- Engine blocks
- Machine casing
- Foundry defects
- Frames
- Rectification and fabrication of conveyers



Joining of Aluminium Pipes

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
2.50	350	60 - 90	2
3.25	350	80 - 110	2
4.00	350	110 - 140	2

Coated Electrode for Aluminium and its Alloys

General Description

An aluminium alloyed, basic electrode recommended for production and maintenance applications including the repair of cracks, casting defects and building up sections and broken parts, also suitable for overlaying applications.

It is specially designed for welding of wrought and cast aluminium alloys, mainly of the half silumin and silumin type, containing up to 12 % silicon, like; G-AISi8Cu3, G-AISi10Mg, G-AISi12. It should not be used with aluminium magnesium alloys like; AlMg2, AlMg3, AlMg5. In case of necessity, it can be applied with oxy-acetylene flame.

Mechanical Strength	████████	████████	████████
Intensity of Humidity	████████	████████	████████
Weld Metal Quality	████████	████████	████████

Mechanical Properties, All Weld Metal

Tensile Strength : 16 - 20 kg/mm²
 Yield Strength : 6 - 8 kg/mm²
 Elongation (L=5d) : 6 - 10 %
 Hardness : 50 - 70 HB

Approvals

GOST, SEPRO

Typical Applications

- Engine blocks
- Truck bodies
- Housings, pumps, tanks
- Molds, pistons, fans, frames
- Casting defects
- Manufacture of petrol engines
- Window frames and stairs
- Gear boxes
- Engine pistons



Repair Welding of
Cast Aluminium Gear Boxes

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
2.50	350	60 - 90	2
3.25	350	80 - 110	2
4.00	350	110 - 140	2

Coated Electrode for Copper and its Alloys

General Description

Kobatek 725 is a tin-bronze electrode for coating and repairing parts made of copper, bronze, red brass and for joining of these to steels, cast iron, nickel and nickel alloys. Possible to work on very large bronze parts without preheating.

Excellent resistance to metal-metal friction and good resistance to corrosion, particularly attack by acetone and dry ammoniac, industrial atmospheres and salty air, sea water and acids. It gives dense, porosity and spatter free, fully machinable deposits.

Compatibility	████████	████████	████████	████████	████████	████████	████████	████████	████████
Corrosion	████████	████████	████████	████████	████████	████████	████████	████████	████████
Machinability	████████	████████	████████	████████	████████	████████	████████	████████	████████

Mechanical Properties, All Weld Metal

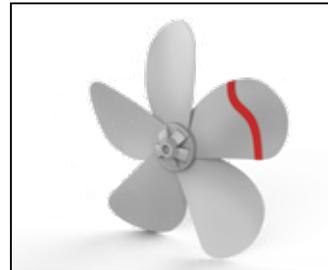
Tensile Strength : 30 - 36 kg/mm²
 Elongation (L=5d) : 15 - 25 %
 Hardness : 100 - 140 HB

Approvals

GOST

Typical Applications

- Electrode holders
- Bearings
- Rotors
- Screws
- Valve seats
- Pump rotors
- Spindles
- Gears
- Spirals
- Pistons
- Repairing defective castings
- Turbine blades



Screw Propellers

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	350	110 - 130	80 - 100	5
4.00	350	145 - 160	110 - 140	5

Digital Inverter Technology - Current Range: 30-160 A

General Description

Kobatek 818 is suited to weld Ti or Nb stabilised Cr-Ni-Mo austenitic stainless steels. It is also used for service temperatures from -120°C up to $+350^{\circ}\text{C}$ in petrochemical industries and for sea water applications. Excellent quality smooth weld beads are highly resistant to acids and to intergranular corrosion at operating temperatures up to 350°C . The weld metal has excellent creep strength upto 850°C .

Kobatek 818 is ideal for joining for stainless steel of similar composition and gives radiographic quality weld beads recommended for welding AISI 316, 317 and 318 type of stainless steels. Deposits exhibit a smooth even shaped bead and ease of slag removal.

Corrosion	██████████
Heat	██████████
Welding Speed	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 56 - 62 kg/mm²
 Yield Strength : 42 - 46 kg/mm²
 Elongation (L=5d) : 30 - 35 %
 Impact (ISO-V) : 65 J (+20 °C)

Typical Applications

- Corrosion resistant pipes
- Tanks and vessels that are made of Cr-Ni-Mo type stainless steel
- Parts that are used in chemical, food and paint industries for acid, salt, gas, vapor and water transmission
- Joining and surfacing of similar composition of stainless steels
- Fabrication of chemical plants
- Paper mill equipments
- Pickling plant
- Parts that works under sea water
- Valve seat inlays



Stainless Steel
Storage Tanks

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	250	80 - 100	60 - 80	5
4.00	350	110 - 140	70 - 100	5

Coated Electrode for Hardfacing Applications

General Description

An AC/DC electrode which has high alloyed Cr-Mo-V weld metal. Deposits produce high resistance to pressure and abrasion and moderate impact resistance.

It is used on steels, alloy steels and carbon manganese steel components. The weld metal is heat resistant up to about 550°C. The alloy combines with a special flux coating formulation to provide a high metal transfer across the arc.

Pressure	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Abrasion	██████████	██████████	██████████	██████████	██████████	██████████	██████████
Heat	██						
Corrosion/Cavitation	██						

Mechanical Properties, All Weld Metal

Hardness : 50 - 55 HRC

Approvals

Typical Applications

- Excavator buckets
- Dredge pump impellers
- Drill bits
- Crushers
- Breaker bars
- Gyratory crusher cones
- Bulldozer buckets
- Chipper rotors
- Screw conveyers
- Cold pressing tools
- Shear blades
- Sideways and guide rails



Drill Bits

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	350	140 - 160	120 - 150	5
4.00	350	220 - 230	170 - 190	5

Coated Electrode for Hardfacing Applications

General Description

A DC electrode specially designed for low-alloy steels with a tensile strength up to 900 N/mm² and the reclamation of the parts subjected to metal-to-metal friction under high pressure.

The readily machinable deposit gives an alloy steel providing high mechanical properties and can be heat treated. It is also suitable for applications where resistance to deformation during service is required for maximum operational life.

Pressure	████████	████	████	████	████
Impact	████████	████	████	████	████
Mechanical Strength	████████	████████	████	████	████
Crack Resistance	████████	████	████	████	████
Machinability	████████	████	████	████	████

Mechanical Properties, All Weld Metal

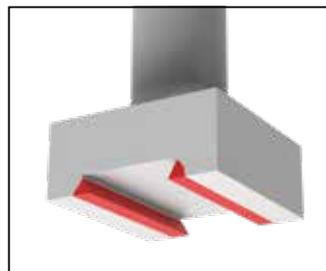
Tensile Strength : 92 - 96 kg/mm²
 Yield Strength : 76 - 80 kg/mm²
 Elongation (L=5d) : 12 - 16 %
 Hardness : 300 - 360 HB

Approvals

GOST, TSEK

Typical Applications

- Rollers
- Forging dies
- Forming dies
- Anvil dies
- Anvil guides of power hammer
- Hammers
- Table rollers
- Turbine blades
- Cushion layers before hardfacing



Anvil Guides
Power Hammer Guides

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	90 - 120	5
4.00	350	110 - 150	5

Coated Electrode for Hardfacing Applications

General Description

The hardest cobalt based coated electrode for hardfacing applications on components where excellent abrasion and corrosion resistance properties are necessary at elevated temperatures. It retains its hardness at temperatures in excess of 760°C. It also provides high resistance to metal-to-metal wear.

The weld deposit contains a high proportion of hard, wear resistant primary carbides making it most suitable for applications where abrasion resistance is of prime importance. It also provides high resistance to erosion and cavitation.

Compared to other cobalt based alloys, it is more crack-sensitive, and care should be taken to minimize the cooling stresses experienced during hardfacing processes. Due to its high hardness and wear resistance, it should only be finished by grinding.

Pressure	████████	████████	████████	████████	████████
Impact	████████	████████	████████	████████	████████
Abrasion	████████	████████	████████	████████	████████
Heat	████████	████████	████████	████████	████████
Corrosion/Cavitation	████████	████████	████████	████████	████████

Mechanical Properties, All Weld Metal

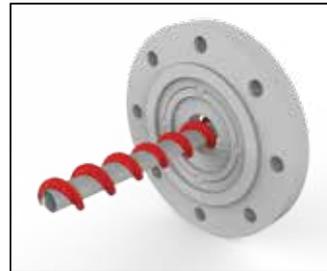
Hardness : 52 - 58 HRC (+20°C)
42 - 46 HRC (+600°C)

Approvals

GOST

Typical Applications

- Shafts of pumps
- Pump and bearing sleeves
- Rotary seal rings
- Conveyor and expeller screws
- Extrusion nozzle
- Wear pads
- Handling equipments for hot steels
- Valve steam tips
- Drill collars
- Facing of rollers
- Hot cutting tools
- Rails



Plastic Injection Screws

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.20	350	90 - 120	5
4.00	350	130 - 150	5

Coated Electrode for Hardfacing Applications

General Description

A cobalt based coated electrode for hardfacing applications on components working at elevated temperatures where high toughness and special hardening properties are necessary combined with machinability.

The weld deposit consists of a solid solution together with complexed carbides to give excellent resistance to impact at elevated temperatures combined with excellent heat, oxidation and corrosion resistance. It also provides high edge retention for metal-to-metal wear and work hardening properties much-needed in the forging industry.

Pressure	████████	████████	████████	████████	████████
Impact	████████	████████	████████	████████	████████
Abrasion	████	████	████	████	████
Heat	████████	████████	████████	████████	████████
Corrosion/Cavitation	████████	████████	████████	████████	████████

Mechanical Properties, All Weld Metal

Hardness : 32 - 38 HRC (as deposited)
45 - 50 HRC (after work hardened)

Approvals

GOST

Typical Applications

- Forging and upset dies
- Stamping dies
- Stripper points
- Hot cutting tools and hot punches
- Plungers
- Shear blades
- Exhaust valves
- Valve seatings
- Gas turbine blades
- Furnace retorts
- Extrusion nozzles
- Draw rings
- Rams



Forging Dies

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.20	350	90 - 120	5
4.00	350	130 - 150	5

Coated Electrode for Hardfacing Applications

General Description

A cobalt based coated electrode for producing excellent wear resistance overlays on carbon and alloy steels. Excellent results can be obtained even when high temperature service conditions exist. It has been designed to withstand corrosion, oxidation and heat, and also has moderate resistance to pressure and abrasion.

Pressure	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████
Abrasion	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████
Corrosion/Cavitation	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

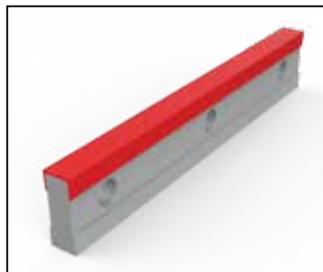
Hardness : 40 - 44 HRC (+20°C)
30 - 32 HRC (+600°C)

Approvals

GOST

Typical Applications

- Hot shear blades
- Hot pressing tools
- Forging dies
- Steam and chemical valve seats
- Pump and bearing sleeves
- Handling equipments for hot steel
- Trimming dies and punches
- Stripper crane points
- Hot pressing dies
- Screw conveyors (for rubber)
- Valve steam tips
- Wear pads
- Drill collars
- Bearing sleeves
- Wire mill rolls
- Beaters for coke comminution



Hot Shear Blades

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.20	350	90 - 120	5
4.00	350	130 - 150	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 544 is a Co-alloyed iron-based electrode that produces weld deposits that achieve a beneficial hardness value with only a single pass. Deposit properties are optimized to display a high creep and scaling resistance and especially superior metal-to-metal wear resistance combined with oxidation at elevated temperatures on tool-steel parts. High thermal conductivity weld deposit retains its hardness and weld properties in service up to 650°C.

It's also ideal for welding of high strength carbon steels and hot working steels. Kobatek 544 produces thick multipass weld deposits that have a reduced cracking sensitivity compared to iron based electrodes of similar deposit hardness.

Exceptional weldability, stable arc, perfect metal transfer and high deposition rate (135%) reduces time and labor costs. Usually there is no need to apply buffer layer according to the base metal type. Preheating of 150-400°C is necessary for massive work pieces depending on the base-metal composition.

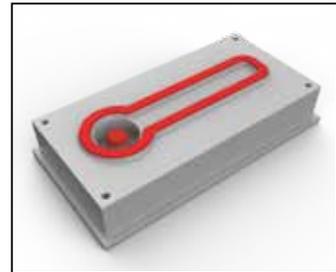
Weld metal can be machined with tungsten carbide tipped tools. Electrode should be inclined at a 45° angle in the direction of travel and should be operated with a medium to short arc distance..

Pressure	██████████	██████████	██████████	██████████
Metal to Metal	██████████	██████████	██████████	██████████
Cavitation	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████
Corrosion	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Hardness : 46 - 50 HRC (as-welded)
54 - 57 HRC (work hardened)

Annealing Temperature : 760 - 800°C
Hardening Temperature : 1050 - 1100°C
Tempering Temperature : 400°C (cool in still air)



Stamping and Trimming Dies

Typical Applications

- Stamping and trimming dies (Automotive Industry)
- Hot extrusion plungers (Manufacture of Plastics)
- Mandrels
- Cylinders used in steel industry
- Kiln parts
- Various parts used in casting industry
- Forging and table rolls (Iron and Steel Works)
- Continuous driving rolls
- Pump shafts
- Wire drawing dies
- Hot forging dies and formers (Iron and Steel Works)
- Hot cutting tools

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC min 70 V

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	80 - 140	5
4.00	350	120 - 180	5

Coated Electrode for Hardfacing Applications

General Description

A cobalt-base coated electrode having high hardness is characterised by a very good resistance to metal and mineral abrasion combined with corrosion and cavitation at high temperature up to 800°C, within the presence of moderate shocks.

Kobatek 545 could be considered an intermediate alloy between Kobatek 543 and Kobatek 540. It contains a higher fraction of hard, brittle carbides than Kobatek 543, and has increased resistance to lowangle erosion, abrasion, and severe sliding wear whilst retaining reasonable impact and cavitation resistance. The higher tungsten content of the weld deposit provides better high-temperature properties compared to Kobatek 543, It also provides special hardening properties combined with machinability.

Kobatek 454 is highly recommended for hardfacing of various cutting tools.

Pressure	██████████
Impact	██████████
Abrasion	██████████
Heat	██████████
Corrosion/Cavitation	██████████

Mechanical Properties, All Weld Metal

Hardness : 46 - 51 HRC (+20°C)
36 - 40 HRC (+600°C)

Approvals

GOST

Typical Applications

- Loop Rollers
- Hot shear blades
- Hot cutting tools
- Saw tips and teeths in the timber industry
- Tools for processing plastics
- Cutting edges of long knives and rotor blades for cutting carpets, plastics, synthetic fibres, papers and cartons
- Pinch rollers in the metal-processing industry
- Hot pressing dies and pressing tools
- Engine and pump valves
- Narrowneck glass mold plungers
- Extrusion screws
- Bearing bushes



Loop Rollers

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.20	350	90 - 120	5
4.00	350	130 - 150	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 550 deposits a Cr-Mo alloyed, medium carbon, low-alloyed steel hardfacing weld metal, that is wear resistant under conditions of high pressure and impact combined with mild abrasion. It is particularly suited for surfacing cold cutting tools and for re-building manganese hard steel.

The deposit is air-hardening, non-mechinable and can resist plastic deformation without cracking. It is suitable for protective overlays on steels including plain carbon steels, carbon manganese steels, low alloy steels and also for welding of cementation steels. Deposits are usually very smooth and may require little or no finishing operation.

Pressure	██████████	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████	██████████
Abrasion	██████████	██████████	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████	██████████	██████████
Erosion	██████████	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Hardness : 54 - 60 HRC

Heat Treatment (except austenitic manganese steels):

Annealing : 28 - 32 HRC (+800°C)

Hardening : 58 - 62 HRC (+950°C)

Tempering : 56 - 58 HRC (+190°C)

Approvals

GOST

Typical Applications

- Driving Sprocket Teeth
- Earth moving equipment
- Dragline bucket tooth
- Farming machinery
- Forestry tools
- Bulldozer blades, scraper blades
- Bucket lips
- Excavator tooth, crusher jaws and hammers
- Concrete mixers
- Plough shaves, pulping knives
- Stamping dies
- Gravel pump housing
- Conveyors
- Tractor pads, links and rollers



Driving Sprocket Teeth

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
2.50	350	80 - 90	70 - 80	5
3.25	350	110 - 130	80 - 120	5
4.00	350	135 - 160	100 - 125	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 551 is a 150% high recovery rutile coated electrode used for maintenance and repair welding of 12-15% Cr, 4% Ni containing ferritic Cr-steels and cast steels. It is also suitable of joining equal and similar ferritic Cr-steels. Weld metal exhibits high corrosion resistance to water, vapor and salt water. Apart from corrosion resistance, it also has a good capability in protecting against cavitation and erosion. It provides high welding performance on steels difficult to weld. Weld metal gives high resistance against pitting problem which is frequently encountered in gears.

Preheating and heat treatment are not necessary for welding of ferritic Cr-steels. It is recommended to clean the workpiece surface from rust and oil before welding.

Metal-Metal Friction	██████████
Erosion	██████████
Pitting Resistance	██████████
Heat	██████████
Corrosion/Cavitation	██████████

Mechanical Properties, All Weld Metal

Hardness : 42 - 46 HRC (as welded)

Typical Applications

- Maintenance and repair welding of rollers used in iron and steel industry
- Continuous-cast rolls
- Steels and castings used for hydraulic turbines
- Pelton, Francis turbine rotors and Kaplan turbine blades
- Water turbines and compressor parts
- Valve bodies used in gas, steam and water fittings and pipelines operating under service temperatures up to 450°C
- Repair welding of cracks in machine bodies
- Erosive and corrosive attacks caused by sea water
- Wear parts from the steel industry and large machinery
- Welding of G-X8 CrNi 13 (1.4008), X4 CrNi 13 4 (1.4313) and G-X5 CrNi 13 4 (1.4343) steels
- Buffer layers performed before hardfacing welding



Rollers

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	90 - 140	5
4.00	350	140 - 170	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 562 is a W, Co and Cr enriched electrode. It gives a speed steel type weld metal that has very good resistance to softening up to 500°C. It gives high hardness and high resistance to impact and pressure. Low preheating temperatures enable the welding of hard metals. A controlled increase of hardness of the deposit can be obtained by heat treatment after welding.

Pressure	██████████	██████████	██████████	██████████
Friction	██████████	██████████	██████████	██████████
Crack Resistance	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Hardness : 46 - 54 HRC

Heat Treatment (except austenitic manganese steels):

Annealing : 310 - 340 HB

Hardening : 50 - 53 HRC (+1150°C)

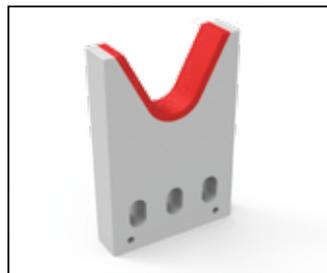
Tempering : 53 HRC (+550°C/1-3 hrs)

Approvals

GOST

Typical Applications

- Cold shear cutting edges and blades
- Profile and slab cutting edges used within the steel industry
- Hardfacing applications of injection molds
- Manufacturing of machining tools



Cold Shear Cutting Edges and Blades

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	350	110 - 140	80 - 120	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 563 is a basic type, Cr-Mo-W and V alloyed coated electrode. It gives a high speed steel type weld metal that has high hardness and very good resistance to impact and pressure up to 500°C. It is especially developed for crack-free coating with good resistance to tempering, thermal and mechanical fatigue (up to 500°C). Weld metal retains its toughness properties at high temperature enabling the formation of high strength welds.

A controlled increase of hardness of the weld deposit can be obtained by heat treatment after welding. The filler metal also provides on average a much higher wear resistance than the base metal.

Low preheating temperatures enable the welding of hard metals.

Pressure	██████████	██████████	██████████	██████████	██████████
Friction	██████████	██████████	██████████	██████████	██████████
Crack Resistance	██████████	██████████	██████████	██████████	██████████

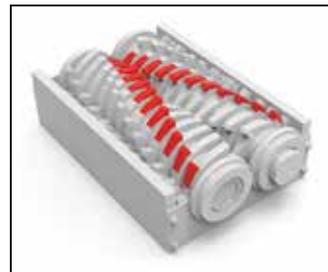
Mechanical Properties, All Weld Metal

Hardness : 57 - 60 HRC (as welded)

Hardening : 65 HRC (after double-tempering)

Typical Applications

- Cold shear cutting edges and blades
- Profile and slab cutting edges
- Drawing tools
- Hardfacing applications of injection molds
- Manufacturing of machining tools
- Scrap crushing blades
- Drilling parts and punching tools
- Wood knives
- Hot work tools



Cold Shear Cutting Edges and Blades

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
2.50	350	70 - 100	5
3.25	350	100 - 140	5
4.00	350	150 - 185	5

Coated Electrode for Hardfacing Applications

General Description

Kobatek 574-Sugar is a high-efficiency stick electrode specifically developed for hardfacing applications on sugar mill rolls in the sugar cane industry and universally applicable on parts predominantly subject to grinding abrasion combined with low impact.

Kobatek 574-Sugar has excellent welding properties and the molten metal flow is easily controlled due to the missing slag formation and homogenous droplet transfer in the spray arc. In general there is no need for any finishing by grinding.

Abrasion	██████████	██████████	██████████	██████████
Impact	██████	██████	██████	██████
Machinability	██████	██████	██████	██████
Heat	██████	██████	██████	██████

Mechanical Properties, All Weld Metal

Hardness : 60HRC (Hardness of pure weld deposit)

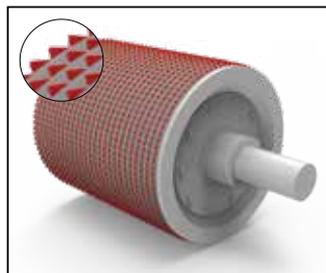
Typical Applications

- Hardfacing applications on sugar mill rolls in the sugar cane industry
- Conveyor screws
- Digging teeth
- Sand pumps
- Mixer wings
- Scraper blades

Welding Instruction:

Hold the electrode as vertical as possible and keep a short arc. For multipass applications a buffer layer with Kobatek 352 is recommended.

Re-dry stick electrodes that have got damp for 2 h / 300°C.



Sugar Cane Mill Rolls

Welding Parameters / Packing and Diameter Information / Welding Positions

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Box Weight [kg]	Packing Type
3.25	350	120 - 150	5	Plastic Box
4.00	450	140 - 170	5	Cardboard Box
5.00	450	180 - 250	5	Cardboard Box

Coated Electrode for Hardfacing Applications

General Description

Kobatek 576 is a high efficiency hardfacing electrode with high content of chromium carbide and boron carbide. The weld metal offers excellent abrasion resistance at high temperature up to 500°C and erosion resistance to the fine mineral particles in gas media. Coal mines, cement industry and iron and steel works are the most frequently used sectors of this product.

In order to minimize the cracking risk, the part must be heated to at least 500°C before welding and should be cooled slowly after welding.

It is also suitable for welding in the vertical-up (3G/PF) position by giving an oscillation to the electrode.

Abrasion	██████████
Erosion	██████████
Heat	██████████

Mechanical Properties, All Weld Metal

Hardness : 66 - 70 HRC (Hardness of pure weld deposit)

Hardness value may vary according to the type of base metal, the welding current and the thickness of the hardfacing layer.

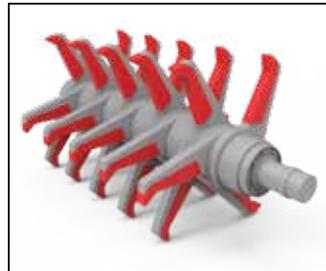
Typical Applications

Coal Mines

Cement Industry

Iron And Steel Works

- Sinter crusher bars
- Mixer paddles
- Clod breakers
- Extrusion screw segments
- Ash plows
- Agglomeration and exhaust fans and valves
- Slag ladles
- Screens working in hot environment
- Tong bits
- Rake teeth in furnace
- Mixer screws and heads in the ceramics and brick industry



Sinter Crusher Bars

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; DC(-) ; AC min 60 V

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	120 - 160	5
4.00	450	150 - 190	5
5.00	450	200 - 250	5

Coated Electrode for Hardfacing Applications

General Description

An AC/DC high chromium-carbide electrode. It has been designed to withstand high abrasive wear under pressure, combined with medium impacts which are specially caused by coarse sand and hard minerals. Also resistant to corrosion and oxidizing. For overlaying carbon steels, low alloy steels and 12-14% austenitic manganese steels, it produces very thick deposits and so only one pass is usually required for most applications.

Deposits are smooth, of good shape and with little or no slag residues as the electrode is almost totally consumed in producing the weld bead. Deposits may check crack to relieve stresses but this will not adversely affect weld adhesion or wear characteristics.

Pressure	████████				
Impact	██████				
Abrasion	████████████████				
Heat	████				
Erosion	████████				

Mechanical Properties, All Weld Metal

Hardness : 60 - 63 HRC (single layer)

Approvals

GOST, TSEK

Typical Applications

- Dragline buckets (lips, points, cutting edges, teeth)
- Scraper blades and mixers
- Conveyor chains
- Mixer blades
- Sludge pumps
- Hammers and crushers
- Crusher jaws
- Guide plates
- Dozer and bits
- Clinker chains
- Screw conveyors
- Crushing mills
- Edge runners and chutes
- Moulding screen segments
- Wearing strips



Fan Blades

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(-) ; AC

Diameter [mm]	Length [mm]	Current (Method-A) [A]	Current (Method-B) [A]	Box Weight [kg]
3.25	350	150 - 170	100 - 120	5
4.00	350	190 - 220	140 - 160	5

Coated Electrode for Hardfacing Applications

General Description

Coated electrode with high alloy content of elements which form complex carbides. The weld metal having this carbide structure offers excellent abrasion resistance to high temperature up to 750°C and erosion resistance to fine mineral particles in gas media.

Also suitable for hardfacing and overlaying a wide range of steels including low alloy steels and 12-14% austenitic manganese steels. Deposition speeds are high and arc striking is made easily. It has a uniform drop transfer and only a negligible slag content. Recovery is approx. 240%.

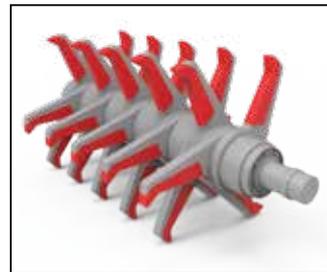
Abrasion	██████████	██████████	██████████	██████████	██████████
Impact	████	████	████	████	████
Erosion	██████████	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Hardness : 64 - 66 HRC (after welding, single layer). The deposit thickness is limited to 2 layers.

Typical Applications

- Crusher bars
- Mixer paddles
- Agglomeration fans
- Sinter plants
- Extrusion screw segments
- Mixer screws and heads in the ceramics industry
- Blast furnace hoppers and bells
- Clod breakers
- Screens working in hot environment
- Mixers used in cement industry and brickwork
- Ash plows
- Coke crusher segments
- Exhaust fans and valves
- Rake teeth in furnace
- Tong bits
- Slag ladles
- Elevator bucket tips



Crasher Bars

Warning!

Pre-heating should not be used when welding on 12-14% austenitic manganese steels and the interpass temperature should be limited to about 260°C for manganese steels.

For high temperature applications at over 260°C, it is recommended to apply a buffer layer with Kobatek 352.

Notes: Hold the electrode almost vertical and maintain a short arc. Select lowest welding current possible to keep dilution low. Weave the electrode slightly for large welding beads.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC

Diameter [mm]	Length [mm]	Current [A]	Box Weight [kg]
3.25	350	120 - 160	5
4.00	350	180 - 220	5

Coated Electrode for Hardfacing Applications

General Description

It is basic coated electrode especially used for hardfacing of alloyed and unalloyed steels. It gives crack-free weld metal with high toughness and has high resistance against abrasive wear, metal-metal friction and cracking under hard working conditions. The highest abrasion resistance is achieved in 3 pass multilayer deposits during welding operation.

Due to its "Cr" content, the filler metal is resistant to corrosive effects that are not severe. It also maintains its hardness at operating temperatures up to 500°C. Weld metal can be machined only by grinding. The risk of cracks and pores formation in the weld bead is low.

Abrasion	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████
Corrosion	██████████	██████████	██████████	██████████
Heat	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Hardness : 54 - 58 HRC

Hardening : Cooling in oil or air at 950-1000°C

Annealing : Slow cooling in oven at 850°C

Typical Applications

- Drilling bits
- Scraper blades of earth-moving machines
- Bucket edges and bucket teeths
- Mixer blades
- Excavator parts
- Guillotine shears
- Cold work tool steel cutting edges
- Pump screws used in cement industry
- Conveyor screws
- Crusher hammers
- Crusher jaws and cones
- Coal planes
- Polygon edges
- Die casting molds
- Rollers



Bucket Teeths

Warning!

Non-alloy steels up to St 70 do not require a buffer layer. It is recommended to apply a buffer layer with Kobatek 301 or Kobatek 315 in alloy materials. For some special materials and in case of very crack sensitive base metals it is necessary to apply a buffer layer with Kobatek 352 or Kobatek 382.

Note: Arc length should be kept short. It is recommended to operate at the lowest possible current to reduce the dilution with base metal. Very slight electrode oscillation can be provided during welding.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+) ; AC min 65 V

Diameter [mm]	Length [mm]	Current [A]	Spool Weight [kg]	Box Type
3.25	350	110 - 140	5	Plastic
4.00	450	150 - 190	5	Carton
5.00	450	180 - 240	5	Carton

Flux-Cored Welding Wire for Buffering and Hardfacing Applications

General Description

All purpose alloy, rebuilding and joining of carbon and 12-14% manganese steels, buffer and multi-pass layers prior to hardfacing applications. Particularly designed for overlaying parts subjected to high impact and pressure conditions, in particular where rock crushing actions are present.

Kobatek T-365 generates very tough and crack-resistant weld metals. Shock impacts result in superficial work hardening. The weld metal is characterized by its good compatibility with all weldable steels.

Weld metal is not suited for flame-cutting but is machinable with cutting tools.

Pressure	██████████	██████████	██████████	██████████	██████████
Impact	██████████	██████████	██████████	██████████	██████████
Abrasion	██████████	██████████	██████████	██████████	██████████
Temperature	██████████	██████████	██████████	██████████	██████████
Erosion	██████████	██████████	██████████	██████████	██████████

Mechanical Properties, All Weld Metal

Tensile Strength : 760 - 820 N/mm²
 Elongation (L=5d) : 25 - 30 %
 Hardness : 200 - 260 HB (as welded)
 : 450 - 550 HB (after work hardening)
 Impact ISO-V : 80 Joule (+20°C)

Typical Applications

- Crane rollers
- Crusher cylinders
- Coupling rolling mill extensions
- Mill shaft drive ends
- Repointing of shovel teeth
- Railway rails and crossovers
- Hammers
- Beating arms



Crane Rollers

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Current [A]	Stick-Out [mm]	Spool Weight [kg]
1.60	180 - 250	20 - 40	15
2.80	250 - 425	35 - 50	15 / 25

Flux-Cored Welding Wire for Hardfacing Applications

General Description

Kobatek T-560 is an open-arc type flux-cored arc welding wire for hardfacing applications which generates high wear-resistant and primary-carbide containing weld metal. It is perfectly suited for hardfacing of parts subjected to strong abrasion and medium shock stresses.

It is especially used in hardfacing application applied on manganese steels, low and high alloy steels, carbon steels and Ni-Hard materials.

The weld metal cannot be subjected to flame cutting and can be machined only by grinding. Due to the very high hardness, stress relief cracks can be formed on the weld metal surface.

Pressure	████████	████	████	████
Impact	████████	████	████	████
Abrasion	████████	████████	████████	████
Temperature	████████	████	████	████
Corrosion	████████	████████	████	████

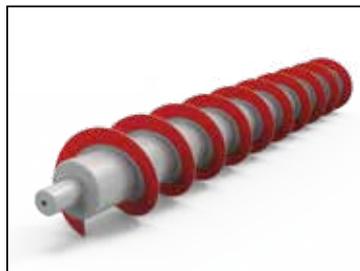
Mechanical Properties, All Weld Metal

Hardness : 62 HRC
55 - 57 HRC (1st layer)
58 - 62 HRC (2nd layer)

The hardness value may vary depending on the base metal type. The hardness values obtained after hardfacing applications on low alloy steels are shown on the side according to the number of passes.

Typical Applications

- Crusher hammers and bars
- Olive seed crushing machine
- Refurbishment of Ni-Hard coal pulverizing rollers
- Top coats on dredger teeth and crushing rolls
- Sand slingers
- Fan blades
- Conveyor crews
- Slag/clinker crushers and crusher jaws
- Separators
- Conveyor chain
- Dredging bucket front edges
- Screw conveyor
- Grinder plates



Screw Conveyor

The arc should be kept as short as possible. In order to eliminate the risk of stress corrosion, it is necessary to apply preheating to the base metal before welding. It is recommended to apply buffer layer with Kobatek T-365 prior to hardfacing application on high carbon steels. Optimum working temperature is max. 375°C.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Current [A]	Stick-Out [mm]	Spool Weight [kg]
1.60	180 - 240	24 - 27	15
2.40	260 - 300	28 - 30	15 / 25
2.80	270 - 320	29 - 31	15 / 25

Flux-Cored Welding Wire for Hardfacing Applications

General Description

Cr-Nb alloy designed to resist high stress grinding abrasion at service temperatures up to 450°C. It generates high wear-resistant, primary carbide-containing weld metal that is extremely resistant to abrasion due to the finely dispersed separation of very hard niobium carbides.

Perfectly suited for hardfacing of parts subjected to extreme abrasion and average shock loads.

The weld metal cannot be subjected to flame cutting, offers good resistance to scaling and cannot be machined. The deposit will readily stress relief check cracks.

Pressure	■				
Impact	■				
Abrasion	■	■	■	■	■
Temperature	■	■			
Corrosion	■				

Mechanical Properties, All Weld Metal

Hardness : 60 - 64 HRC (pure weld metal)
57 - 61 HRC (after 1st layer)

Typical Applications

- Crusher jaws
- Mixer blades
- Pump impellers
- Mould screws
- Dredging bucked front edges
- Sand slingers
- Top coats of dredger teeth and crusher rolls
- Wear plates
- Crusher hammer discs
- Excavators



Crusher Hammer Discs

Buffering and Intermediate Layers :

Kobatek T-365 should be used as initial or intermediate layers especially on large or heavy build-up applications and also on %12-14Mn steels.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Current [A]	Stick-Out [mm]	Spool Weight [kg]
1.60	180 - 250	20 - 40	15
2.80	270 - 420	30 - 55	15 / 25

Flux-Cored Welding Wire for Hardfacing Applications

General Description

Kobatek T-570B is especially used in hardfacing applications performed on manganese steels, low and high alloy steels and carbon steels.

Due to the homogeneous dispersion of very hard niobium and bor carbides in austenitic matrix, it provides a high wear-resistant, primary carbide-containing weld metal. Filler metal is very resistant to excessive wear and average shock loads. High hardness is achieved in single pass.

The weld metal cannot be subjected to flame cutting and can be machined only by grinding. There is no need to use shielding gas during welding.

Pressure	██████				
Impact	██				
Abrasion	██████████				
Temperature	██████				
Erosion	██████████				

Mechanical Properties, All Weld Metal

Hardness : 62 - 66 HRC

Typical Applications

- Paddles and scraper teeth of bucketwheel elevators used in coal and phosphate mines
- Drills, augers and conveyor screws in brick and clay mills
- Bulldozer blades, shovel bucket teeths and lips working in sand
- Wear plates and transport screws used in quarries and cement industry
- Groundnut expeller screws



Sand Conveyor Screws

The stick out should be kept between 35-40 mm and the hardfacing layer should be carried out at no more than two passes. It is recommended to apply buffer layer with Kobatek T-365 prior to hardfacing application on high carbon steels, especially on large or heavy build-up applications and also on 12-14% Mn steels.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Current [A]	Spool Weight [kg]
1.60	180 - 200	15

Flux-Cored Welding Wire for Hardfacing Applications

General Description

Kobatek T-580 generates high wear-resistant, primary-carbide containing weld metal. Perfectly suited for hardfacing of parts subjected to strong abrasion and medium shock loads. Application temperature should not exceed 350°C.

The weld metal cannot be subjected to flame cutting and cannot be machined. The deposit will readily stress relief check cracks.

Pressure	██████████	████	████	████	████
Impact	██████████	████	████	████	████
Abrasion	██████████	██████████	██████████	████	████
Temperature	██████████	████	████	████	████
Erosion	██████████	████	████	████	████

Mechanical Properties, All Weld Metal

Hardness : 60 - 63 HRC (pure weld metal)
 56 - 60 HRC (1st layer)
 58 - 62 HRC (2nd layer)

Typical Applications

- Screws
- Dredging bucket front edges
- Stirrer blades
- Sand slingers
- Top coats on dredger teeth and crushing rolls
- Refurbishment of Ni-Hard coal pulverizing rollers
- Handling sand



Conical Crushing Rolls

Buffering and Intermediate Layers :

Kobatek T-365 should be used as initial or intermediate layers especially on large or heavy build-up applications and also on %12-14Mn steels.

Welding Parameters / Packing and Diameter Informations

Current Type and Polarity : DC(+)

Diameter [mm]	Current [A]	Stick-Out [mm]	Spool Weight [kg]
1.60	160 - 250	20 - 40	15
2.40	230 - 350	25 - 50	15
2.80	270 - 420	30 - 55	15 / 25

GMA (MIG/MAG) Welding Wire for Hardfacing Applications

Classification

DIN 8555 : MSG 5-GZ-350
Wr-Number : 1.7384*

(*) Similar

General Description

Kobatek MIG T-350/S is a hardfacing MIG wire, providing a resistant weld metal against high loads of impact and pressure and wearing. Weld metal is Cr-Mo alloyed and can be machined mechanically. High wear resistant is achievable especially at metal against metal wearing. Weld metal is highly crack resistant and has high strength in sulfur containing environments.

Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Mo	V	W
0.08	0.55	0.90	6.00	0.90	0.10	< 0.25

Mechanical Properties, All Weld Metal

Hardness : 337 - 372 HB
 : 36 - 40 HRC
Working Temperature : 500 °C
Preheating Temperature : 200 °C
Postweld Heat Treatment : 660 °C

Shielding Gases (ISO 14175 / EN 439)

MIG : M21 - Ar + 5-25% CO₂
 C1 - CO₂ (100%)

Current Type and Polarity

DC(+)

Typical Applications

- Guiding rollers and wheels
- Gears
- Moulds
- Excavators
- Crushers
- Threads
- Cutting tools
- Hammers
- Both metal surfaces rubbing on each other
- Guiding rails
- Roller bed rolls

Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	-	X	-	-	-	-	15 kg

GMA (MIG/MAG) Welding Wire for Hardfacing Applications

Classification

DIN 8555 : MSG 6-GZ-C-60G
 Wr-Number : 1.4718
 EN : X45CrSi9-3
 EN DIN 14700 : Fe8

General Description

Kobatek T-600/S is a hardfacing MIG wire, providing a martensitic structured weld metal, resistant against abrasion wearing under impact. Weld metal has a structure of Cr-Si and if it is not tempered, can only be machined by grinding. Perfect resistance can be achieved metal against metal wearing.

Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr
0.45	3.00	0.40	9.30

Mechanical Properties, All Weld Metal

Hardness : 550 - 620 HB
 : 55 - 60 HRC
 Working Temperature : 550 °C
 Preheating Temperature : 250 °C
 Postweld Heat Treatment : 700 °C
 Softening Heat Treatment : 780 - 820 °C
 Hardening Heat Treatment : 1000 - 1050 °C

Shielding Gases (ISO 14175 / EN 439)

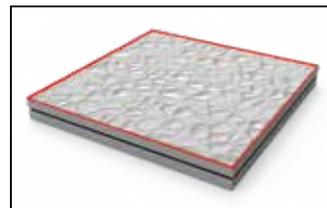
MIG : M21 - Ar + 5-25% CO₂
 C1 - CO₂ (100%)

Current Type and Polarity

DC(+)

Typical Applications

- Ceramic moulds
- Hammers of cylindrical crushers
- Pneumatic hammers
- Shear blades
- Mixers
- Cold cutting, drilling and forging tools



Ceramic Cutting Mould Edges

Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	-	X	-	-	-	-	15 kg

GMA (MIG/MAG) Welding Wire for Hardfacing Applications

Classification

DIN 8555 : MSG 3-GZ-60T
 Wr-Number : 1.2606
 EN : X35CrWMoV5

General Description

Kobatek T-650/S is a hardfacing MIG wire, providing a martensitic structured filling metal, resistant against consistent abrasion wearing under impact. Weld metal has a structure of Cr-Mo-W-V and can only be processed by grinding.

Chemical Composition (w%), Typical, Wire

C	Si	Mn	Cr	Mo	V	W
0.35	1.10	0.40	5.20	1.40	0.40	1.30

Mechanical Properties, All Weld Metal

Hardness : 558 - 620 HB
 : 57 - 60 HRC
 Working Temperature : 550 °C
 Preheating Temperature : 300 °C
 Postweld Heat Treatment : 680 °C

Shielding Gases (ISO 14175 / EN 439)

MIG : M21 - Ar + 5-25% CO₂
 C1 - CO₂ (100%)

Current Type and Polarity

DC(+)

Typical Applications

- Hammers of cylindrical crushers
- Threads
- Conveying spires
- Pneumatic hammers
- Peeling knives
- Mixers
- Hot and cold cutting
- Drilling
- Forging tools

Packing and Diameter Informations

Diameter	0.8	1.0	1.2	1.6	2.0	2.4	3.2	Spool Weight
MIG/MAG Wire	-	-	X	-	-	-	-	15 kg

LINCOLN ELECTRIC TURKEY

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