



elektrode jesenice d.o.o.

HARDFACING ELECTRODES

UTOP 38	K1
UTOP 43	K2
UTOP 45	K3
UTOP 52	K4
UTOP 55	K5
TOOLDUR	K6
E DUR 250	K7
E DUR 300	K8
E DUR 400	K9
E DUR 500	K10
E DUR 600	K11
E DUR 60R	K12
E DUR 600Si	K13
TOOLDUR Co	K14
E DUR 13 Cr	K15



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Classification:

EN 14 700: E Fe 3
DIN 8555: E 3-UM-40 T

UTOP 38

Description and application:

Basic Mo, Cr, V flux-alloyed electrode with high toughness, wear, heavy impact resistance and easy machinable weld metal.

It is suitable for hardfacing cold and hot working tools, for correction of cavities, like die blocks, dies and containers for metal tube and rod extrusion tools for manufacture of hollow bodies, screws, nuts, rivets and bolts, pressure die casting dies, die insert, ...

Base materials:



Heat treatment:

Coating type:
Basic

Welding current:

DC +

Welding positions:



Redrying temperature:
400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr	Mo	V	W
0.13	5.0	4.3	0.2	+

Mechanical properties:

Hardness: Welded: 36-42 HRC (typical: 37 HRC)

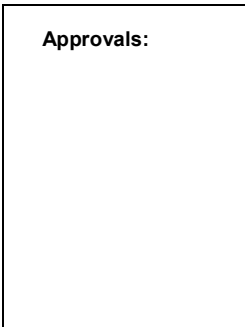
The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ Carton Kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4.4	22	17.3
3.25	350	110-135	4	20	34.6
4	450	130-170	5.4	27	72
5	450	180-220	5.4	27	110.2

* approximate data

Approvals:





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Classification:

EN 14 700: E Fe 3
DIN 8555: E 3-UM-400PT

UTOP 43

Description and application:

Basic Mo, Cr, V flux-alloyed electrode with high toughness, wear, heavy impact resistance and easy machinable weld metal.

It is suitable for hardfacing cold and hot working tools, for correction of cavities, like die blocks, dies and containers for metal tube and rod extrusion tools for manufacture of hollow bodies, screws, nuts, rivets and bolts, pressure die casting dies, die insert, ...

Base materials:



Alloyed tool steels

Heat treatment:

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr	Mo	V
0.3	0.25	1	2	0.5	0.6

Mechanical properties:

Hardness: as welded 40- 45 HRC (typical: 45 HRC)
PWHT 550°C/2h 45-50 HRC (typical 50HRC)
PWHT 800°C/2h 25-35 HRC (typical 31HRC)

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Approvals:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ Carton Kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	17.3
3.25	350	110-135	4.4	22	34.6
4	450	130-170	5.4	27	72
5	450	180-220	5.4	27	110.2

* approximate data



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Classification:
EN 14 700: E Fe 3
DIN 8555: E3-UM-45-T

UTOP 45

Description and application:

Basic Cr, W, V flux alloyed all purpose electrode, with very good weld metal thermo-shock stability. Working temperature till 550°C. It is suitable for hardfacing hot working tools.

Base materials:



Alloyed tool steels

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature

Redrying temperature:

300-350°C / 2 h

or

400°C / 1 h

Typical all weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr	V	W
0.3	0.6	1.1	2.5	0.7	4.5

Mechanical properties:

Hardness:

As welded: 42-50HRC

PWHT 550°C/2h 45-53 HRC

PWHT 800°C/2h 20-35 HRC

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	17.1
3.25	350	95-135	4	20	35.2
4	450	130-190	5.4	27	66.7
5	450	190-250	5.4	27	135

* approximate data

Approvals:



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Classification:
EN 14 700: E Fe 3
DIN 8555: E3-UM-60-T

UTOP 52

Description and application:

Basic Cr, W, V flux alloyed all purpose electrode, with very good weld metal thermo-shock stability. Working temperature till 550°C. It is suitable for hardfacing hot working tools.

Base materials:

unalloyed	
alloyed steels	
alloyed tool steels	

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

300-350°C / 2 h
or
400°C / 1 h

Approvals:

Typical all weld metal properties:

Chemical composition, wt %:

C	Cr	Ni	Mo	V	W	Fe
0.4	7	0.5	0.7	0.7	7	rest

Mechanical properties:

Hardness:

As welded: 50-59 HRC
PWHT 550°C/2h -8h 53-58 HRC

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70 - 90			
3.25	350	110-135			
4	450	130-170			
5	450	180-220			

* approximate data



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Classification:

EN 14 700: E Fe 4
DIN 8555: E 6-UM-60 T

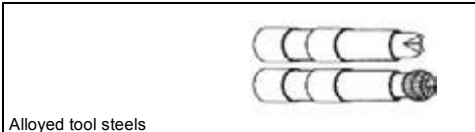
UTOP 55

Description and application:

Basic Mo, Cr, V flux-alloyed electrode with high toughness, wear and heavy impact resistance. The weld metal can be treated with grinding and cut after soft annealing.

It is suitable for hardfacing cold and hot working tools, like die blocks, dies and containers for metal tube and rod extrusion, tools for manufacture of hollow bodies, screws, nuts, rivets and bolts, pressure die casting dies, die insert, hot shear blades...

Base materials:



Heat treatment:

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr	Mo	V	W
0.4	5.0	4.8	0.6	+

Mechanical properties:

Hardness: Welded: 55-60 HRC (typical: 57 HRC)

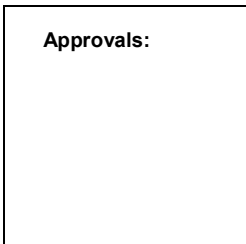
The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300/350	70-90	4	20	17.1
3.25	350	110-135	4.4	22	35.2
4	450	130-170	5.4	27	66.7
5	450	180-220	5.4	27	135

* approximate data

Approvals:





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Classification:

EN 14 700: E Fe 4
 DIN 8555: E 4-UM-60 -65 S
 AWS A 5.13: E Fe5-B

TOOLDUR

Description and application:

Basic Mo, Cr, W,V flux-alloyed electrode for building up new and resurfacing worn parts of tools and machines also at high temperatures.

It is suitable for building up and repairing tools of high speed steel, for resurfacing beads, shears, knives... The weld metal can be treated with grinding and cut after soft annealing.

Base materials:



Heat treatment:

The ground material should be preheated to 600-700°C

Hardening: 1180-1240°C (air)

Stress relief: 510-540°C/ 2X1h (air)

Soft annealing: 820-850°C/2-4h (furnace)

Coating type:

Basic

Welding current:

AC

DC +

Welding positions:



Redrying temperature:

300°C / 2h

Typical weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr	Mo	W	V
0.7	0.5	0.5	4.4	7.0	1.2	0.9

Mechanical properties:

Hardness:

Welded: 50-64 HRC (typical: 61 HRC)

Hardened: 62-66 HRC

Soft annealed: 25-30 HRC

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	350	70-100	4	20	20.8
3.25	350	100-150	4	20	35.7
4	350	130-185	4.4	22	53.5

* approximate data

Approvals:



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Classification:
 EN 14 700: E Fe 3
 DIN 8555: =E 1-UM-250

E DUR 250

Description and application:

Basic, Cr flux-alloyed electrode for surfacing applications where medium hardness is required. It gives wear and heavy impact resistant weld metal, suitable for machine parts exposed to wear, cog wheels, tracks etc... The deposit can not be hardened.

Base materials:



Steels
 Cast steels

Heat treatment:

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr	Mn
0.13	1.3	1.3

Mechanical properties:

Hardness: 230-300 HB (typical: 270 HB)

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	18.5
3.25	350	100-135	4	20	34.8
4	450	130-170	5.4	27	74
5	450	180-220	5.4	27	112.5
6	450	230-270	5.4	27	158.8

* approximate data

Approvals:

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Classification:

EN 14 700 : E Fe 1
DIN 8555: ≈E 1-UM-300

E DUR 300

Description and application:

Basic, Cr flux-alloyed electrode for surfacing applications where medium hardness is required. It gives wear and heavy impact resistant weld metal, suitable for machine parts exposed to wear, cog wheels, tracks etc...

Base materials:




Steels
Cast steels

Heat treatment:

Coating type:
Basic

Welding current:
DC +

Welding positions:


Redrying temperature:
400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr	Mn
0.18	1.2	1.5

Mechanical properties:

Hardness: 280-350 HB (typical: 320 HB)

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Approvals:

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Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	16.5
3.25	350	100-135	4	20	34.8
4	450	130-170	5.4	27	69.2
5	450	180-220	5.4	27	103.8
6	450	230-270	5.4	27	154.3

* approximate data



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Classification:

EN 14 700 : E Fe 3
DIN 8555: E 1-UM-400

E DUR 400

Description and application:

Basic, Cr-Mn flux-alloyed electrode for surfacing applications. It gives wear and heavy impact resistant weld metal, suitable for machine parts exposed to wear, machines for structural engineering, cog wheels, chain wheels, tracks etc...

Base materials:



Steels
Cast steels

Heat treatment:

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr	Mn
0.25	1.3	1.7

Mechanical properties:

Hardness: 350-450 HB (typical: 390 HB)

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	16,5
3.25	350	100-135	4	20	34,8
4	450	130-170	5,4	27	69,2
5	450	180-220	5,4	27	103,8
6	450	230-270	5,4	27	154,3

* approximate data

Approvals:

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Classification:

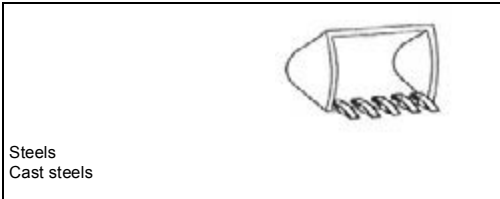
EN 14 700: E Fe 3
DIN 8555: E 1-UM-50

E DUR 500

Description and application:

Basic coated electrode for very hard buildups on excavator components such as bucket edges, chain links, cutting tools, dies, etc.

Base materials:



Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1 h

Typical all weld metal properties:

Chemical composition, wt %:

C	Mn	Cr
0.4	2.0	2.3

Mechanical properties:

Hardness: 47 - 52 HRC (typical: 51 HRC)

Interpass temperature for the weld metal approx. 350°C.

The hardness of the deposit is greatly influenced by the degree of dilution with the base metal (depending on the relevant welding condition) and by its chemical composition. The influences of these factors decreases as the number of layers gets higher.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70 – 90	4	20	18
3.25	350	100 – 135	4	20	36
4	450	130 – 170	5.4	27	68.4
5	450	180 – 220	5.4	27	108
6	450	230 – 270	5.4	27	154.3

* approximate data

Approvals:



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Classification:
 EN 14 700 : E Fe 8
 DIN 8555: E 6-UM-60

E DUR 600

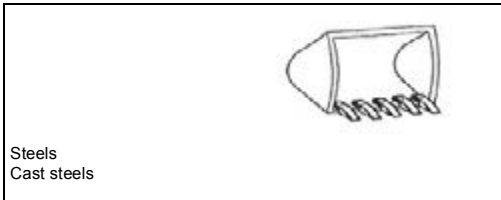
Description and application:

Electrode is used for surfacing of steel parts when heavy impact resistance is needed. Welding material possesses higher abrasion resistance.

Suitable for surfacing parts exposed to heavy abrasive wear by stone, coal, sand etc...

The weld metal can be treated with grinding and cut after soft annealing.

Base materials:



Heat treatment:

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

400°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Cr
0.5	8.5

Mechanical properties:

Hardness: 57-62 HRC (typical: 59 HRC)

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	18
3.25	350	100-135	4	20	36
4	450	140-180	5.4	27	68.4
5	450	180-230	5.4	27	108
6	450	240-280	5.4	27	154.3

* approximate data

Approvals:

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Classification:

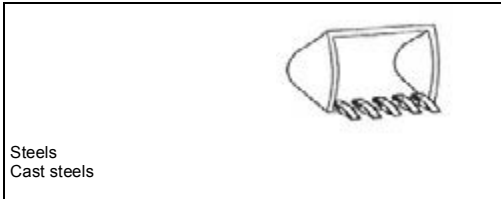
EN 14 700: E Fe 8
DIN 8555: E 6-UM-55

E DUR 60 R

Description and application:

Rutile electrode is used for surfacing of steel parts when heavy impact resistance is needed. Welding material posses higher abrasion resistance. Suitable for surfacing parts exposed to heavy abrasive wear by stone, coal, sand etc... The weld metal can be treated with grinding and cut after soft annealing.

Base materials:



Coating type:

Rutile

Welding current:

DC + (DC -)
AC

Welding positions:



Redrying temperature:

350°C / 1h

Typical all weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr	Mo
0.5	0.5	0.5	5	1

Mechanical properties:

Hardness: 55- 60 HRC (typical: 60 HRC)

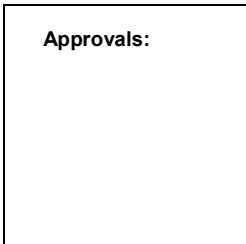
The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	18
3.25	350	100-135	4	20	36
4	450	140-180	5.4	27	68.4
5	450	180-230	5.4	27	108
6	450	240-280	5.4	27	154.3

* approximate data

Approvals:





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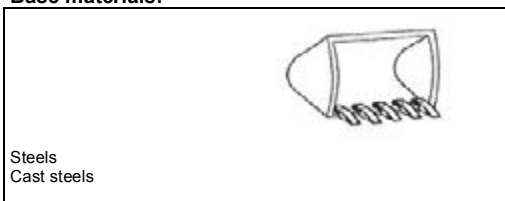
Classification:
EN 14 700: E Fe 8
DIN 8555: E 6-UM-55

E DUR 600Si

Description and application:

Basic Cr and Si alloyed electrode is used for surfacing of steel parts when heavy impact resistance is needed. Welding material posses higher abrasion resistance. Suitable for surfacing parts exposed to heavy abrasive wear by stone, coal, sand etc... The weld metal can be treated with grinding and cut after soft annealing.

Base materials:



Coating type:
Basic

Welding current:

DC +

Welding positions:



Redrying temperature:
350°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr
0.5	3	0.5	8

Mechanical properties:

Hardness: 55-59 HRC (typical: 58 HRC)
Wear coeff.: 0,8%

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	18
3.25	350	100-135	4	20	36
4	450	140-180	5.4	27	68.4
5	450	180-230	5.4	27	108
6	450	240-280	5.4	27	154.3

* approximate data

Approvals:



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Classification:

EN 14 700: E Fe 3
DIN 8555: ≈E 3-UM-50CTZ

TOOLDUR Co

Description and application:

Special electrode with Co, for hot wear resistant surfacing on hot working tools, where high temperature change and stress are present, as: cast tools, trimming tools, extrusion press tools, hot flow presses for steels, hot shearing- machines.. Optimal operating temperatures are till 650°C, resistant to scaling to 900°C, weld metal is nitratable. The weld metal is machinable. When surfacing low alloy steel, 3-4 layers are required.

Base materials:

Low alloyed steels
Alloyed tool steels
High temperature steels and cast steels

Heat treatment:

Preheating: 150-400°C according to weld.
Hardening: 1100-1150°C (air)
Soft- annealing: 850-900°C
Tempering: 700°C

Coating type:

Rutile-basic

Welding current:

AC
DC +

Welding positions:



Redrying temperature:

300°C / 2h

Metal recovery:

Typical weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr	Ni	Mo	Co	Fe
0,2	0,5	0,2	9	1	4,5	12,5	rest

Mechanical properties:

Hardness: untreated 48-52 HRC
Hardened 48-52 HRC
Soft-annealed about 34HRC
Tempered 38-42 HRC

The hardness of the deposit depending on the relevant welding conditions and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ Carton kg	Weight/ 1000 pcs kg *
2,5	350	70-100	4	20	20,8
3,25	350	100-150	4	20	35,7
4	350	160-185	4,4	22	53,5

* approximate data

Approvals:



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Classification:

EN 14 700 : E Fe 8
DIN 8555: E 5-UM-CGP

E DUR Cr 13

Description and application:

Electrode is used for surfacing of steel parts when heavy impact and moderate wear and corrosion resistance up to 400°C is needed. Suitable for surfacing parts of press tools, mixer arms, valve seats, feed gears, cutting edges, knives, track rollers... The weld metal is martensitic and can be treated with grinding, it can be shaped with hard metal cutting tool immediately after welding, before weld metal has cooled down to 200°C.

Steel Cast steel Alloyed tool steel

Heat treatment:

Preheat and inter-pass temperature at least 200°C, soft annealing 820°C, hardening 950-1000°C with cooling in compressed air or oil.

Coating type:

Basic

Welding current:

DC +

Welding positions:



Redrying temperature:

350°C / 1h

Typical weld metal properties:

Chemical composition, wt %:

C	Si	Mn	Cr
0.3	0.5	0.8	13

Mechanical properties:

Hardness: 49-56 HRC

The hardness of the deposit depending on the relevant welding condition and the chemical composition of the base metal.

Welding and packing data:

Welding parameters			Packing		
φ mm	Length mm	Current A	Weight/ packet kg	Weight/ carton kg	Weight/ 1000 pcs kg *
2.5	300	70-90	4	20	
3.25	350	90-120	4,4	22	37,6
4	450	110-160	5,4	27	73
5	450	150- 190	5,4	27	106

* approximate data

Approvals: