



## Durferrit Salts and Auxiliary Products



Product Catalogue



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## Nitrocarburizing

Ionic liquids offer a significant improvement in wear protection, sliding properties and fatigue strength on all kind of ferrous materials. A subsequent oxidizing quenching produces a major increase in corrosion resistance. Due to the main process characteristics like

- ⇒ **excellent reproducibility on high quality level**
- ⇒ **shortest treatment times**
- ⇒ **most negligible distortion**
- ⇒ **highest flexibility**

This technology often gives superior results to that of galvanic layers and other nitrocarburizing processes.



## Salts for nitrocarburizing

With TUFFTRIDE® and ARCOR® we offer two different environment-friendly processes for nitrocarburizing. Which of both processes is the most appropriate one

depends on the requirements and the geometry of the parts. Our Technical Sales Department will be pleased to giving you advice to make the right choice.

### TUFFTRIDE®-Process

Product	Application	Working temp. in °C
TF 1	Cyanide-free replenishment salt. For use only with REG 1 regenerator.	480 – 630
REG 1	Non-toxic regenerator for TF 1 baths.	
AB 1 AB 1.8	Oxidizing salts for enhancing the corrosion resistance of TUFFTRIDE® treated components and for QPQ®-process.	370 – 420
AB 1 A AB 1.8 A	Starter salts for the initial filling.	



## ARCOR®-Process

Product	Application	Working temp. in °C
CR 2	Non-toxic regenerator for CR 4 baths.	
CR 4	Cyanide-free replenishment salt for the ARCOR® C-process; for use only with CR 2 regenerator.	540 – 590
CR 8	Cyanide-free replenishment salt for the ARCOR® V/N-process; for use only with CR 9 regenerator.	480 – 630
CR 9	Non-toxic regenerator for CR 8 baths.	
OX R	Oxidizing salt for cooling parts treated with CR 4 or CR 8; leads to an important increase of the corrosion resistance.	420 – 440
OX 1.2	Starter salt for the initial melting of OXINIT baths.	

## NSK

Product	Application
NSK	In special cases for the artificial activation of TF 1 baths.



## Solid nitrocarburizing products

Powder nitriding (Pulnieren) is done analogical to pack carburizing and does not require complex

equipment. It is a very economical process for the treatment of small series or tools.

Product	Application	Working temp. in °C
Pulnierpulver Aktivator	Cyanide-free base powder. Non toxic activation product. The required amount depends on the treated parts.	450 - 600

# Carburizing and Carbonitriding

Carburizing salt melts feature following advantages:

- ⇒ **the best temperature uniformity**
- ⇒ **high reproducibility of the carburizing effect**
- ⇒ **easy to control**
- ⇒ **very flexible in use**

DUROFER® is an environmental friendly process as the products don't contain any cyanide and the carbon activity is controlled by adding the regenerator CECONTROL®. Hence amount of waste salts are considerably reduced. This technology can also be used for hardening being free of decarburization as long as the melt is set for low activity.



## DUROFER®-Process

Product	Application	Working temp. in °C
CECONTROL®	Non toxic regenerator. For use only with the base salts CECONTROL® 50 H, 80 B and 110 B.	
CECONTROL® 50 H	Cyanide free start-up and replenishment salt to achieve a surface carbon level of approx. 0.5 % C. For use only with CECONTROL® regenerator.	780 – 950
CECONTROL® 80 B CECONTROL® 110 B	Cyanide free start-up and replenishment salt to achieve surface carbon level of 0.8 % resp. 1.1 % C. For use only with CECONTROL® regenerator.	820 – 950



## Other salts for carburizing and carbonitriding

Product	Application	Working temp. in °C
CECONSTANT® 80 CECONSTANT® 110	One-salt system to achieve a surface carbon level of approx. 0.8 resp. 1.1 % C.	850 – 950
CECONSTANT® 80 A CECONSTANT® 110 A	Starter salts for the initial filling.	
GS 540 / C 3	This two-salt system is also suitable for carbonitriding below A <sub>1</sub> .	700 – 950

## Solid carburizing products

Pack carburizing is a technology which can be operated in simple chamber furnaces. Our products are granules which are characterized by their

- ⇒ **consistent carburizing activity**
- ⇒ **low sulfur content**
- ⇒ **high stability**
- ⇒ **low tendency of forming dust during usage**
- ⇒ **capability of being used several times**

Product	Application	Working temp. in °C
KG 6.2	Mild carburizing granules for carburizing alloyed steels to depths over 0.6 mm.	900 approx.
KG 30.2	Strong carburizing granules for carburizing non-alloyed and alloyed steels with depths up to approx. 0.6 mm.	900 approx.
AUFSTREUHÄRTEPULVER	For surface hardening of tools. The powder is sprinkled onto the tool after bringing it to red heat with the welding torch or in a furnace.	

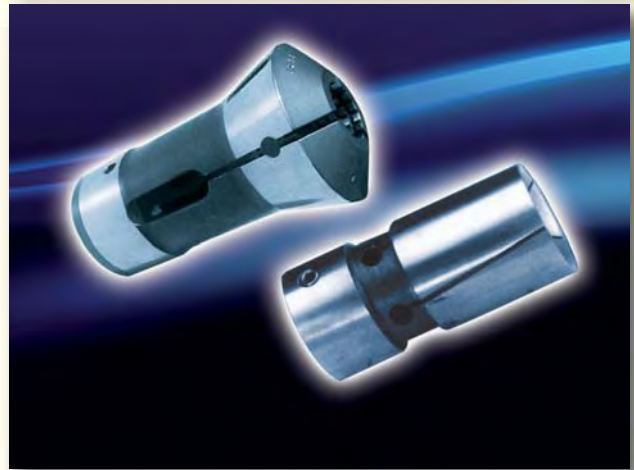


# Annealing and Hardening

Annealing salts are usually used as part of a 2-salt system in combination with an additive, otherwise decarburization and oxidation will take place with increasing treatment temperature. We are offering two different classes of additives.

The cyanide-free products bind successfully oxygen containing compounds and ensure the inert character of the liquid. They can be used up to a temperature of 1100 °C.

The second class of additives gives the melt a certain carbon activity which depends on its concentration and the nature of the base salt. However, due to the short treatment times the carbon activity is allowed to vary considerably from the carbon content of the steel and has not to be adjusted within closer limits. The DUROFER®-Process is also suitable for hardening being free of decarburization (see carburization and carbonitriding) as long as the melt is set for low activity.



## Base salts

Product	Application	Working temp. in °C
GS 230	For quenching and tempering above 300 °C.	270 – 600
GS 430	For tempering, cooling or quenching of steel for which AS bathes are not suitable.	500 – 700
GS 520	Replenishment salt for GS 430 baths.	
GS 540	For heating and annealing.	600 – 950
GS 560	Barium free salt for annealing silver, gold and brass.	600 – 850
GS 660	Nontoxic salt for annealing steel and non-ferrous metals.	700 – 900
GS 670	For heating and annealing.	750 – 1000
GS 750		850 – 1100
GS 960	For heating and annealing.	1050 – 1250

## Additive salts for inert annealing; cyanide-free

Product	Application
R 2	For the prevention of decarburization and oxidation in combination with GS 540, GS 670, GS 750.
R 3	Nontoxic additive for the prevention of decarburization and oxidation in combination with GS 660.



## Additive salts for preventing decarburization

Product	Application
C 1	For the prevention of decarburization and oxidation in combination with GS 540, GS 560, GS 660 and GS 670, if the carbon content of C 3 is undesirable.
C 3	For the prevention of decarburization and oxidation in combination with GS 540, GS 560, GS 660 and GS 670. Contains active carbon to form a bath cover.

## Supplements

Product	Application
SCHUPPENGRAPHIT	For covering baths to reduce temperature losses. This product is only scattered in small amounts and can also be used for cyanide-free annealing baths.
AKTIVAT	Covering agent to reduce temperature losses. Suitable for baths having a certain carburization activity.
DRS 3	A dip emulsion that prevents rusting.



# Heat Treatment of High-Speed Steel

Tools treated in our salts are well known for their superior quality. Due to the highest temperature uniformity and quickest heat transfer a fine grain structure with the corresponding proportion of solute carbides is achieved. Pre eutectoid carbide precipitation at the grain boundaries or local formation of intermediate structure are avoided. Our technology provides benefits like:

- ⇒ **Highest hardness combined with excellent toughness.**
- ⇒ **Partial hardening easy realizable.**
- ⇒ **Ideal quenching conditions regardless of part diameter.**
- ⇒ **Lowest distortion compared to other hardening processes.**



Product	Application	Working temp. in °C
GS 540	Salt for the 2 <sup>nd</sup> preheating stage.	800 – 950
GS 750 / R 2	2-salt systems for the 3 <sup>rd</sup> preheating stage.	1050 – 1100
CARBONEUTRAL®	For austenitizing of high alloyed tool and high-speed steels. Additives are reducing decarburization.	1000 – 1300
SEMPERNEUTRAL® 950	For austenitizing of high alloyed tools and high-speed steels. Additives prevent from decarburization.	1100 – 1300
SEMPERNEUTRAL® 1100	For austenitizing of high-speed steels. Additives prevent from decarburization. Less sensitive to moisture than SEMPERNEUTRAL® 950.	1200 – 1300
GS 430	Quenching salt for high alloyed tool and high-speed steels.	500 – 580

## Supplements

Product	Application
DUOPERL®	For covering the CARBONEUTRAL® or SEMPERNEUTRAL® baths.
GS 960	For saturating a new lining of the furnace.
DRS 3	A dip emulsion that prevents rusting.

# Quenching and Tempering

The great benefits of martempering are the lowest grade of size alteration and distortion. The austenitized components are quenched to a temperature close above the martensite starting point to ensure temperature equalization between surface and core. This allows a martensitic formation being as uniform as possible during further cooling.

Moreover, for austempering the AS salts are the first choice as these assure the best attainable toughness.



## Salts for quenching and tempering

Product	Application	Working temp. in °C
AS 140	For austempering, martempering, tempering and blueing. Not suitable for components which are heated above 950 °C or treated in a bath containing more than 13 % KCN.	160 – 550
AS 220	For austempering, martempering, tempering and blueing. Not suitable for components which are heated above 950 °C or treated in a bath containing more than 13 % KCN.	250 – 550
AS 235	Non toxic salt for austempering, martempering, tempering and blueing. Not suitable for components which are heated above 950 °C or treated in a bath containing more than 13 % KCN.	280 – 550
AS 300	Non toxic salt for austempering, tempering and blueing. Not suitable for components which are heated above 950 °C or treated in a bath containing more than 13 % KCN.	340 – 550
GS 430	For quenching and tempering parts which are austenitized at temperatures above 950 °C.	500 – 560

## Specials

### Additives for water quench

Some materials like mild or low alloyed steel need such rapid cooling rates which can only be realized in water. However, plain tap water will evaporate on the hot surface during quenching (Leidenfrost phenomenon) resulting in reducing quenching speed with high risk of local pearlite formation. The HYDRODUR® additives restrain successfully this phenomenon and give very clean parts.



Product	Application
HYDRODUR®	Additive for improved water quenching performance, gives components silver grey appearance. At 70 °C the maximum cooling rate is approx. 50 % higher than water.
HYDRODUR® GF	Non toxic additive for improved water quenching performance. At 70 °C the maximum cooling rate is approx. 25 % higher than water.
HYDRODUR® 20	Additive for improved water quenching performance, gives components slightly dark appearance. At 70 °C the maximum cooling rate is approx. 50 % higher than water.

### Corrosion protection

After cleaning, the work piece must be treated to prevent the very sensitive metal surface against corrosion.

Product	Application
DRS 3	A dip emulsion that prevents rusting.

### Covering products for waste salts

Product	Application
DUROSORB	For sprinkling waste salts. Prevents the release of odours.



# Aluminium Heat Treatment

The quality of solution annealed and age hardened aluminium resp. aluminium alloys increases strongly with temperature uniformity as well as with the speed of heat transfer. For that reasons liquid salts are the first choice.

They are well known for their excellent temperature constancy and provide

- ⇒ **quickest heat transfer by contact which successfully oppressed grain growth for gaining a very fine core structure**
- ⇒ **avoidance of deleterious precipitation of alloying elements on grain boundaries since the remaining salt film on the parts prevents from critical cooling effects during transfer into quenching station**
- ⇒ **shortest treatment times.**



## Salts for the annealing of aluminium and aluminium alloys

Product	Application	Working temp. in °C
AVS 220	For solution annealing and age hardening of aluminium and aluminium alloys containing maximal 10 % of magnesium.	270 – 550
AVS 250	For solution annealing and age hardening of aluminium and aluminium alloys containing maximal 10 % of magnesium.	340 – 550

# Boriding

Boriding is a thermochemical process which gives components

- ⇒ **very high hardness up to 2000 Vickers**
- ⇒ **outstanding abrasive wear resistance**
- ⇒ **high temperature strength up to 800 °C**
- ⇒ **strongly reduced sticking properties**

We supply the boriding product alternatively as fine granules or as paste. Both give excellent layer qualities and oppress successfully the unwanted very brittle FeB-phase.



## Boriding products

Product	Application	Working temp. in °C
DURBORID® G	Granules that create perfectly formed boride layers for maximum performance. After treatment the work piece can be easy removed.	850 –1000
DURBORID® PASTE	Water-based boriding paste, submersible and sprayable, hardly drips for high quality layers. Also suitable for partial boriding. Must be used with an inert gas (Ar, N <sub>2</sub> ).	850 –1000

# Blackening

Blackening produces an uniform deep black layer on components made from ferrous materials which gives them a decorative appearance. It is performed by immersion in a boiling alkaline oxidizing salt solution.



## Salts for blackening Pre- and post-treatment products

Product	Application	Working temp. in °C
G 19 / G 22	Alkaline cleaner for hot degreasing prior to blackening.	60 – 80
BEIZENTFETTER	For descaling prior to blackening. Has some degreasing properties.	RT
FERROBLACK® MH	Blackening salts containing special additives for a wide range of application.	140 approx.
FERROBLACK® SPEZIAL	Ideal for blackening silicon containing steel and cast iron.	140 approx.
FERROBLACK® HL	Particularly suitable for parts with copper coatings and brazed joints.	140 approx.
FERROBLACK® NIF	Non-toxic blackening salt; more suitable for 2-bath processes.	140 approx.
FERROSOL / FERROSOL HL	A booster for all blackening bathes either for short-term regeneration or for treatment of complicated workpieces.	
STREICH- BRÜNIERBEIZE	A fluid product for brushing on or immersion at room temperature. Ideal for repairs and hobby use.	RT
KALTOL	Dewatering fluid to quicken the drying process. Provides temporary corrosion protection.	
DRS 3	A dip emulsion that prevents rusting.	



## Salts for Heat Transfer

Very often chemical processes take place in a closely defined and frequently very narrow temperature range. In industrial plants, salts are used as heat transfer media for heating and cooling as well as for holding at constant temperature. Our heat transfer salts offer following benefits:

- ⇒ **excellent heat transfer properties**
- ⇒ **low meeting point approx. 142° C**
- ⇒ **best possible chemical consistency**
- ⇒ **regenerable within certain limits**
- ⇒ **pressure-less operation despite high working temperatures**



Product	Application	Working temp. in °C
ASD	Heat transfer salt for the chemical industry.	180 – 450
ASD REG	For regenerating ASD salts.	
HT 400	Heat transfer salt for the chemical industry for use at higher temperatures.	> 400

## Salts for Vulcanizing

RUBBERCURE products are special designed heat transfer salts used with great success for the vulcanization of rubber profiles which are for example continuously extruded. Some of their advantages are

- ⇒ **high vulcanization speed**
- ⇒ **compact profile surface without any porosity**
- ⇒ **high long-term thermal stability of the salt melt**
- ⇒ **excellent protection against corrosive attack**
- ⇒ **rubber profiles are easy to clean**



Product	Application	Working temp. in °C
RUBBERCURE	For vulcanizing in LCM and PLCV plants.	> 180
RUBBERCURE REG	For regenerating RUBBERCURE salts.	
RUBBERCURE LAS	Non toxic classified vulcanizing salt.	> 160

# Thermochemical Cleaning of Metallic Surfaces

Cleaning salts are used for the quick and gentle removal of coatings which are difficult to dissolve, even in narrow crevices and small bore holes.

The formulation of each product is optimized regarding their special application.



## Cleaning salts

Product	Application	Working temp. in °C
ALKO® N	For descaling titanium.	200 – 220
KOLENE® No. 4	Removes moulding sand, graphite, oil coke, casting crust and scale. For cast iron, steel and cast aluminium.	400 – 500
KOLENE® No. 5	Removes organic materials: semi and fully synthetic plastics, paint, lacquer, grease, oil, resin, carbon, graphite, rubber etc. Ideal for cleaning steel and cast iron.	400 – 500
KOLENE® No. 6	Removes paint, oil carbon and plastics from aluminium and steel work pieces, also grey cast iron.	300 – 400
KOLENE® No. 10	Removes organic materials: semi and fully synthetic plastics, paint, lacquer, grease, oil, resin, carbon, graphite, rubber etc. Ideal for cleaning chrome-alloyed tools.	380 – 480
DGS®	Removes scale and rolling skin, metal oxides, glass residue (drawing agent), sand residue, oil coke, oil, grease and other organic traces from stainless steels and other Cr / Ni materials.	370 – 540
RS 700	Removes ceramic moulding material based on silicon and aluminium oxides, also zirconium oxide, from precision castings. Devitrifies Pt-Rh-spinning nozzles and similar components, removes enamel.	600 – 700

KOLENE® is a registered trademark of Kolene Corporation.

## Stop-off Compounds

Based on our long lasting experience the stop-off compounds are continuously optimized especially regarding environment and safety at work. The products are offering benefits like

- ⇒ **best protection**
- ⇒ **easy in use**
- ⇒ **short trying times**



## Aqueous lacquer based masking compound

Product	Application
CONTRADUR WSC 200	Silicate free product for gas carburizing up to 1.3 mm case depth; applicable by painting; easy removable with hot water or alkaline cleaner
CONTRADUR® WSC 201	Silicate free product for gas carburizing up to 1 mm case depth; applicable by dipping; easy removable with hot water or alkaline cleaner.
WAGA BN	For gas carburizing up to 1.3 mm case depth; applicable by painting.
WAGA	For gas carburizing for more than 1.3 mm case depth; applicable by painting or dipping.
WAGA Plus	For gas carburizing for more than 1.3 mm case depth; favorable at higher humidity; applicable by painting.
ANTIDUR	For gas carburizing for more than 1.3 mm case depth; applicable by dipping.
CONTRADUR WSN 100	For gas nitriding and nitrocarburizing; applicable by painting.
CONTRADUR Spezial PN	For plasma nitriding and nitrocarburizing; applicable by painting.





## Solvent based stop-off compounds

Product	Application
CONTRADUR GAKO	For gas carburizing up to 1.3 mm case depth; applicable by painting or dipping.
CONTRADUR UDK-N	For low pressure and vacuum carburizing up to 1.7 mm case depth; applicable by painting or dipping.
BLACK 15 N	For gas carburizing up to 1.3 mm case depth; is to be preferred if an oxygen free atmosphere cannot be excluded; applicable by painting or dipping.
S 100	For gas and plasma nitriding; applicable by painting.
THINNER I	Thinner for CONTRADUR GAKO and S100.
THINNER II	Thinner for BLACK 15 N and CONTRADUR UDK-N.

## Kneadable stop-off compounds

Product	Application
ATOMIN	For pack carburizing and sealing hardening boxes; easy kneadable and removable; esp. for small holes, threads, etc.
REKORD	For pack carburizing and sealing hardening boxes; only little shrinking properties; favorable for larger areas or pin holes.

# Product list

AB 1 / AB 1.8 / AB 1 A / AB 1.8 A	2	CECONSTANT® 80 A	5
AKTIVAT	7	CECONSTANT® 110	5
AKTIVATOR	3	CECONSTANT® 110 A	5
ALKO® N	15	CONTRADUR GAKO	17
ANTIDUR	16	CONTRADUR UDK-N	17
AS 140	9	CONTRADUR WSC 200 / WSC 201	16
AS 220	9	CONTRADUR WSN 100	16
AS 235	9	CONTRADUR Spezial PN	16
AS 300	9	CR 2	3
ASD	14	CR 4	3
ASD REG	14	CR 8	3
ATOMIN	17	CR 9	3
AUFSTREUHÄRTEPULVER	5	DGS®	15
AVS 220	11	DRS 3	7; 8; 10; 13
AVS 250	11	DURBORID® G	12
BEIZENTFETTER	13	DURBORID® PASTE	12
BLACK 15 N	17	DUOPERL®	8
C 1	7	DUROSORB	10
C 3	5; 7	FERROBLACK® HL	13
CARBONEUTRAL®	8	FERROBLACK® MH	13
CECONTROL®	4	FERROBLACK® NIF	13
CECONTROL® 50 H	4	FERROBLACK® SPEZIAL	13
CECONTROL® 80 B	4	FERROSOL / FERROSOL HL	13
CECONTROL® 110 B	4	G 19 / G 22	13
CECONSTANT® 80	5		

# Product list

GS 230	6	R 2	7; 8
GS 430	6; 8; 9	R 3	7
GS 520	6	REG 1	2
GS 540	5; 6; 8	REKORD	17
GS 560	6	RS 700	15
GS 660	6	RUBBERCURE	14
GS 670	6	RUBBERCURE REG	14
GS 750	6; 8	RUBBERCURE LAS	14
GS 960	6; 8	S 100	17
HT 400	14	SCHUPPENGRAPHIT	7
HYDRODUR®	10	SEMPERNEUTRAL® 950	8
HYDRODUR® GF	10	SEMPERNEUTRAL® 1100	8
HYDRODUR® 20	10	STREICHBRÜNIERBEIZE	13
KALTOL	13	TF 1	2
KG 6.2 / KG 30.2	5	VERDÜNNER I	17
KOLENE® No. 4	15	VERDÜNNER II	17
KOLENE® No. 5	15	WAGA	16
KOLENE® No. 6	15	WAGA BN	16
KOLENE® No. 10	15	WAGA Plus	16
NSK	3		
OX R	3		
OX 1.2	3		
PULNIERPULVER	3		

Details we provide on our products and appliances as well as our plants and process methods are based on comprehensive research work and operational experience. We provide such data either verbally or in writing to the best of our knowledge and belief on the understanding that they do not present any warranty concerning the existence of specific characteristics in our products, but reserve the right to make technical modifications in the course of product development.

This does not, however, relieve the user of his responsibility to check our data and recommendations for his own application before using them. This also applies - particularly for shipment abroad - with regard to the maintenance of protection rights of third parties and to applications and process methods not expressly declared by ourselves in writing. In the case of loss our liability is limited to replace goods and services on the same scale as is stipulated for quality defects in our General Conditions of Sale and Delivery.





## Notes



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