

Technische Informationen

Verwendung funkenfreier Werkzeuge, deren Eigenschaften und die richtige Behandlung.

Sowohl die grundsätzlichen Fragen der Funkensicherheit, wie auch über Verwendung, Eigenschaften und Behandlung von funkenfreien Werkzeugen bestehen die verschiedensten, teils irrtümlichen Auffassungen.

Die wichtigsten Gesichtspunkte sollen daher nachstehend hervor gehoben werden, um auch dem Nichtfachmann ein möglichst zutreffendes Bild von den möglichen Gefahren und deren sachgemäßer Bekämpfung zu geben. Es handelt sich ausschließlich um praktische Hinweise. Auf die komplizierteren physikalischen und technologischen Fragen kann hier nicht näher eingegangen werden.

1. Verschiedene Gas-Luft-Gemische können durch Funken, die z.B. beim Schlagen mit üblichen Stahlwerkzeugen entstehen, zur Explosion gebracht werden; dazu gehören vor allem Gemische aus Luft und Schwefelkohlenstoff, Wasserstoff, Acetylen, Äthylenoxyd, Kohlenoxyd und Schwefelwasserstoff.

Um bei Vorhandensein oder Bildung solcher Gemische der bestehenden Explosionsgefahr entgegenzutreten, muss das Entstehen zündfähiger Funken unter allen Umständen vermieden werden. Die Verwendung funkenfreier Werkzeuge stellt hierfür eine wesentliche, aber nicht die einzige Maßnahme dar, die durch andere Vorkehrungen sinnvoll ergänzt werden muss.

Funkenfreie Werkzeuge, wie z.B. Dönges-Sicherheitswerkzeuge, bestehen aus Speziallegierungen auf Kupferbasis, welche – im Gegenteil zu Stahl – bei Beanspruchung durch Schlag oder Reibung keine zündfähigen Funken abgeben. Die Werkzeuge als solche sind absolut funkensicher, jedenfalls unter allen im praktischen Gebrauch auftretenden Beanspruchungen.

2. Unter besonders ungünstigen Umständen können jedoch auch mittels eines funkenfreien Werkzeugs indirekt zündfähige Funken gezogen werden. Dies ist möglich, wenn an rostigen Stahlflächen gearbeitet wird, wobei sich die Gefahr durch einen etwa vorhandenen Aluminiumanstrich noch wesentlich erhöht. Die Abtrennung funkenbildender Teilchen von metallischen oder mineralischen Oberflächen (z.B. Beton) mittels eines funkenfreien Werkzeugs geschieht desto eher, je größer der Härteunterschied zwischen Werkzeug und bearbeitetem Material ist.

Hieraus resultiert, dass funkenfreie Werkzeuge aus möglichst wenig harten Legierungen gefertigt sein müssen; diese Forderung findet ihre Grenzen in der vom jeweiligen Werkzeug verlangten Gebrauchshärte, was besagt, dass z.B. bei einem Meißel auf eine höhere Härte nicht verzichtet werden kann, ein Hammer, ein Schraubenschlüssel oder eine Hebestange dagegen sehr wohl aus weniger hartem Material gefertigt sein kann. Die bei der Herstellung von Dönges-Sicherheitswerkzeugen angewendeten Richtlinien stimmen hiermit überein.

3. Da man unter gewissen Umständen, wie erwähnt, die Explosionsgefahr durch die Verwendung funkenfreier Werkzeuge allein nicht vollständig ausschalten kann, sind zur Erzielung einer möglichst weitgehenden Sicherheit gegebenenfalls zusätzliche Vorkehrungen notwendig. Vor allem sind rostige oder mit Leichtmetallanstrich versehene Oberflächen mit Öl oder Wasser bei der Arbeit zu benetzen, falls eine Beseitigung des Rostes bzw. des Anstrichs nicht schon vorher erfolgen kann. Für gute Belüftung der Arbeitsstelle und Raumes ist zu sorgen. Auch die Verwendung eines Arbeitszeltes gegen Außeneinflüsse kann manchmal zweckmäßig sein. Behälter, Apparate und Rohrleitungen sind unter Umständen mit Schutzgas zu füllen.

Ferner ist darauf zu achten, dass nicht durch herabfallende Gegenstände oder Werkstücke Funken erzeugt werden; vorsichtshalber ist deshalb der Fußboden zu befeuchten. Ebenso sollten an der Arbeitskleidung keine Eisenteile vorhanden sein, insbesondere keine Schuhnägel, Absatzseisen und dergleichen. Zur Erzielung der größtmöglichen Sicherheit sind alle diese Punkte unbedingt zu beachten.

4. Es ist eine Eigenart funkenfreier Werkzeuge, dass sie aufgrund der dafür verwendeten Werkstoffe empfindlicher sind als Stahlwerkzeuge. Beim Gebrauch derartigen Gerätes muss daher sorgfältiger und schonender als üblich verfahren werden. Treten Abnutzungserscheinungen auf, ist es zweckmäßig, die Werkzeuge rechtzeitig zu überholen. Auch soll jedes Werkzeug nur für die ihm zugedachten Aufgaben verwendet werden, nicht etwa Meißel als Brechstange oder normale Schraubenschlüssel als Schlagschlüssel einsetzen.

Dönges-Sicherheitswerkzeuge verlangen nur geringe Vorkehrungen bei der Nacharbeit. Das Nachschleifen sollte vorsorglich nass erfolgen, damit kein Härteverlust entsteht.

Funkenfreie Werkzeuge aus Kupfer-Beryllium, wie z.B. Spachtel, Schraubendreher, Zangen, usw., dürfen aus verschiedenen Gründen keinesfalls in der gleichen Weise nachgeschliffen werden wie Werkzeuge aus Stahl. Bei einer Erwärmung über 250°C geht die Gebrauchseigenschaft der Legierung Kupfer-Beryllium weitgehend verloren und das Werkzeug weist dann nur noch die Härte von Kupfer auf, wird also praktisch unbrauchbar. Deshalb sollten diese Werkzeuge ausschließlich nass geschliffen werden.

Das Nassschleifen unterbindet vor allem die Entstehung von Kupfer-Beryllium-Stäuben oder Dämpfen, deren Einatmen zu gesundheitlichen Schädigungen führen kann. Im Normalgebrauch sind Werkzeuge aus Kupfer-Beryllium jedoch ungefährlich.

Eine sorgfältige Berücksichtigung dieser Hinweise empfiehlt sich für jeden Benutzer von funkenfreien Werkzeugen im eigenen Interesse, da dann nicht nur die größtmögliche Sicherheit erreicht wird, sondern auch eine möglichst lange Lebensdauer der Werkzeuge gewährleistet ist.

Technical information

Use of non-sparking tools, their quality characteristics and the correct treatment

There are a lot of wrong ideas about spark safeness as well as about use, properties or handling of non-sparking tools.

The list below shows the most important aspects of the potential dangers and their correct abatement, also very useful for a non-professional. These are only practical advices. The more complicated physical and technological questions can not be answered here.

1. Using a steel tool can cause sparks. These sparks together with some gas-air mixtures (e. g. mixtures of air and carbon disulfide, hydrogen, acetylene, ethylene oxide, carbonic oxide and hydrogen sulphide) can end up in explosions. One way to avoid this is the use of non-sparking tools combined with other appropriate precautions.

Dönges-safety tools are made of a special copper based alloy. This special alloy - unlike steel - does not produce sparks in any normal working condition.

2. Under certain conditions, a non-sparking tool can also indirectly produce sparks, e.g. working on rusty steel surfaces. The hazard is even bigger as soon as the surface has a coat of aluminium. The possible separation of spark producing parts from metallic or mineral surfaces (e. g. cement) by a non-sparking tool increases the higher the grade of hardness between tool and treated material is.

For this reason, non-sparking tools are made of soft alloys. However, some tools e. g. chisels should not be made of soft alloys, whereas hammers, wrenches and wrecking bars can be made of soft alloys. Dönges produces its' safety tools according to these guidelines.

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4. A characteristic of non-sparking tools is that the basic materials are more sensitive than those of steel tools. The use has to be more accurately and gentle compared to usual tools. In case of any abrasion the tools have to be checked up. Use every non-sparking tool only for what it is made for: a chisel is not a wrecking bar and a normal wrench is not a striking wrench.

Dönges safety tools need fewer precautions while reworking. To avoid losing hardness, the tools have to be wet-grinded.

Non-sparking tools made of copper-beryllium, e.g. spatulas, screwdrivers, pliers, can for different reasons not be grinded the same way as steel tools. Heating over 250° C destroys the characteristics of the copper-beryllium alloy and the tool has then only the hardness of copper and therefore practically useless. These tools can only be wet-grinded. This also avoids the development of copper-beryllium dust or smoke. Inhaling both can cause severe health problems. The regular use of copper-beryllium tools however is not dangerous.

We recommend taking all advices into consideration when using non-sparking tools to guarantee safety as well as a long life cycle of these tools.

Nachbearbeitung

Um Dönges-Sicherheitswerkzeuge richtig und mit Erfolg nachbearbeiten zu können, muss zunächst die Legierung, aus der das Werkzeug gefertigt ist, eindeutig festgestellt werden.

Werkzeuge aus Sonderbronze weisen eine gelbliche Farbe auf (Abweichungen der Oberflächenfarbe durch Einwirkung der Atmosphäre, von Chemikalien und auch durch Erwärmung sind möglich), während Werkzeuge aus Kupfer-Beryllium eine mehr rötliche Farbe zeigen und gewöhnlich mit der Legierungsbezeichnung gestempelt sind, z.B. „CuBe“.

1. Werkzeuge aus Dönges-Metall können nachbearbeitet werden und zwar durch Schmieden, regenerierende Schweißmaßnahmen und durch spanabhebende Bearbeitung.

Diese Nacharbeiten sollten vorzugsweise in unserem Betrieb durchgeführt werden, da im Anschluss an die Arbeiten zu nachfolgenden Punkten „a“ und „b“ auf jeden Fall eine Härteprüfung, wenn nicht sogar Härtung der Werkzeuge folgen muss.

- a Das Schmieden geschieht im Temperaturbereich zwischen 785°C und 900°C, die günstigste Schmiedetemperatur ist etwa 880°C. Die Temperaturgrenzen sind genau zu beachten, im Übrigen sind besondere Vorkehrungen nicht notwendig. Die Teile dürfen jedoch nicht abgeschreckt werden, sondern müssen langsam an der Luft abkühlen.
- b Das Aufschweißen oder Ausbesserungsschweißen geschieht mittels materialgleichen Schweißzusatzwerkstoffen.
- c Auch bei der spanabhebenden Nachbearbeitung sind keine speziellen Vorsichtsmaßnahmen einzuhalten. Es können die gleichen Bearbeitungswerkzeuge und -vorrichtungen verwendet werden, wie bei Handwerkzeugen aus Stahl. Nachschleifarbeiten sollten unter guter Kühlung (z.B. Wasser) durchgeführt werden.

2. Werkzeuge aus CuBe müssen mit großer Sorgfalt und Vorsicht nachgearbeitet werden. Insbesondere ist dabei zu beachten, dass Staub oder Dämpfe von Kupfer-Beryllium giftig sind und gesundheitliche Schäden hervorrufen können. Ferner verliert Kupfer seine Legierungseigenschaften durch Überhitzung sehr leicht und unter Umständen völlig, so dass der Werkstoff dann nur noch die Eigenschaften gewöhnlichen Kupfers hat.

- a Das Nachschmieden von Werkzeugen oder Teilen aus CuBe kann nicht ohne Weiteres empfohlen werden, da das Schmieden in Verbindung mit einer nachträglichen Wärmebehandlung langjähriger Erfahrung bedarf. Bitte fragen Sie uns, ob eine Schmiedung in bestimmten Fällen durchführbar ist.
- b Bei der spanabhebenden Bearbeitung, insbesondere beim Schleifen, ist sorgfältig zu kühlen und eine Erwärmung über 250°C unter allen Umständen zu vermeiden. Die Bearbeitungswerkzeuge müssen einen Spanwinkel von etwa 0° aufweisen, sofern die Bearbeitung im ausgehärteten Zustand erfolgt.

WICHTIGER HINWEIS für das Nachschleifen von Dönges-Sicherheitswerkzeugen aus Kupfer-Beryllium:

Beryllium ist ein Metall, das nach der Arbeitsstoff-Verordnung unter die giftigen Arbeitsstoffe fällt!

Die betrifft insbesondere Stäube und Dämpfe, die beim Schmelzen, Schleifen und Schweißen entstehen können.

Es besteht keine Gefahr, wenn vor allem das Schleifen nass vorgenommen wird!

Falls dies in Ausnahmefällen nicht möglich ist, sind folgende Maßnahmen zu beachten:

1. **Staub nicht einatmen (Maske verwenden)**
2. **Berührung mit der Haut und den Augen vermeiden**
3. **Schutzkleidung tragen**
4. **Bei Staub- und Rauchentwicklung wirksames Atemschutzgerät tragen**

Reworking

Reworking Dönges safety tools correctly and successfully, you have to find out first which metal alloy the tool is made of.

Tools made of special bronze are coloured yellowish (meanderings of the surface colour are possible due to atmospheric influences, chemicals and heating), whereas copper-beryllium tools are reddish and normally stamped with the alloy identification "CuBe".

1. Dönges tools can be reworked by forging, welding and chip removing processing. We recommend having these works done by our company to check hardness or even harden the tool afterwards.
 - a The forging temperature usually lies between 785° C and 900° C; the best temperature for reworking is about 880° C. It is important to keep to these temperature limits. After forging, the tools should air dry and never be quenched.
 - b For the build-up or reworking welding use filler material which is made of the same material as the tools.
 - c For the chip removing processing the same tools and machines can be used as for steel tools. The regrinding should be done under cooling (e. g. water).
2. Reworking the Dönges CUBE tools should be done with a lot of care. Copper-beryllium smoke and the dust are toxic and carcinogenic. Copper-beryllium may never be heated up over 250°. CUBE, if it is overheated, can lose its alloying attributes!
 - a We do not recommend reforging CUBE tools. Reforging and later heat treatment requires years of experience. Please ask us for help and advice.
 - b The chip removing processing, especially grinding, needs to be done under constant cooling to avoid heating over 250°C. The chip angle should be approx. 0°.

Important advice for regrinding of Dönges tools made of copper-beryllium (CUBE):

Beryllium falls under the toxic working materials regulation!

This means especially the dust and smoke which may be produced while melting, grinding and welding.

There is no danger, if you do the wet-grinding!

If this is not possible, there are some precautions need to be taken:

- 1. Don't inhale the dust (use a mask)!**
- 2. Avoid contact with skin and eyes!**
- 3. Wear protective clothing!**
- 4. Wear a respiratory mask if dust or smoke occurs!**

Index

	Seite		Seite
A			
Abisolierzange	80	Durchsteckknarre 3/4"	53
Amerikanischer Handhammer	86	Durchsteckknarre 1"	57
Amerikanischer Maschinistenhammer	87	Durchtreiber (Hammer)	88
Amerikanischer Maurerhammer	87	Durchtreiber konisch	93
Amerikanischer Schlosserhammer	86	Durchtreiber konisch extra starke Ausführung	94
Arbeitslampe UK 300	132	Durchtreiber konisch starke Ausführung	93
Arbeitsschere	81	Durchtreiber spindelförmig	94
Aufsätze für Rückschlagfreie Hämmer	90	Durchtreiber-Satz	94
Aufsteckrohre für Ringzugschlüssel	28	E	
Axt	108	Eckrohrzange	76
B			
Beil	108	Eckrohrzange mit 90° Maul	76
Beißzange	79	Eimer	121
Beißzange starke Ausführung	79	Einfachringsschlüssel	21
Besen	105	Einfachringsschlüssel in Zoll	21
Betonmeißel	92	Einmaulschlüssel	13
B-Handradsschlüssel	35	Einmaulschlüssel in Zoll	14
Blech-Doppelmaulschlüssel	12	Einreißhaken	109
Blech-Doppelmaulschlüssel in Zoll	12	Elektriker-Schraubendreher	68
Blehschere	81	F	
Blehschere verstärkt	81	Fassheber	117
Bohrer	126	Faßschlüssel universal	37
Bohrer-Satz	126	Fäustel	85
Bolzenschneider	80	Fäustel mit Fiberglasstiel	85
Brechstange	115	Feuerwehraxt	108
Brechstange mit Schneide und Kugel	116	Feuerwehrbeil	108
Brechstange mit Spitze und Klaue	116	Flachfeile	122
Brechstange mit Spitze und Kugel	116	Flachmeißel	91
Brechstange mit Spitze und Schneide	116	Flachschaber	99
Breitspachtel	101	Flachzange	79
Bügelsäge	120	Flanschkeil	114
Bürste	104	Flanschlöser	126
C			
Crimpzange	80	Flanschmesser gerade	115
D			
Doppelmaulschlüssel	10	Flanschmesser rund	115
Doppelmaulschlüssel in Zoll	11	Flaschenzug	127
Doppelmaulschlüssel in Zoll Satz	11	Frankfurter Schaufel	110
Doppelmaulschlüssel klein	12	Fuchsschwanz	120
Doppelmaulschlüssel klein Satz	12	Fugenkelle	101
Doppelmaulschlüssel-Satz	10	Fussbodenschaber	102
Doppelringsschlüssel gekröpft	18	G	
Doppelringsschlüssel gekröpft in Zoll	19	Gabel für Schießbaumwolle	112
Doppelringsschlüssel gekröpft in Zoll Satz	19	Gasbrennerzange	77
Doppelringsschlüssel gekröpft Satz	18	Gelenkgriff 1/4"	44
Doppelringsschlüssel gerade	20	Gelenkgriff 1/2"	48
Doppelringsschlüssel gerade in Zoll	20	Gelenkgriff 3/4"	54
Drahtbürste	104	Gelenkgriff 1"	58
Drehmomentschlüssel 1/2"	49	Gelenkhakenschlüssel	34
Drehstift für Klauenschlüssel	41	Gewindereinigungsstift	95
Dreikant Steckschlüsseleinsatz 1/2"	36	Glättkelle	101
Dreikant-Plattenschaber	100	Grubenpickel	109
Dreikantschaber	100	Gummihammer	88
Dreikant-Steckschlüssel	36	Gummischieber aus Holz	105
Dunggabel	111	Gürteltasche für Taschenlampe	134
Durchsteckknarre 1/4"	44	H	
Durchsteckknarre 1/2"	47	Hahnenfußschlüssel Maulform 1/2"	42
		Hakenschlüssel	34
		Halbrundfeile	122
		Handbürste	105
		Handfeger	105

H	Seite
Handhammer amerikanische Form.....	86
Handleuchte Eisemann.....	135
Handpickel.....	109
Handradschlüssel.....	35
Handsäge.....	120
Handschaufel.....	110
Handscheinwerfer Eisemann.....	135
Haue.....	108
Handwerker Werkzeugkoffer.....	138
Hebestange.....	116
Heckenschere.....	111
Helm- und Arbeitslampe UK 3AA eLED CPO.....	133
Helm- und Arbeitslampe UK 4AA ES,ET Xenon.....	135
Helmhalterung universal für Taschenlampe.....	134
Heugabel.....	111
Holzhammer.....	88
Hörnadel.....	125
Hörnadel mit Kugelkopf.....	125
Hubwagen.....	127
K	
Kanaldeckelhaken.....	37
Kanaldeckelhaken verstärkte Ausführung.....	37
Karbidtrommelöffner.....	117
Kardangelen 1/4".....	45
Kardangelen 1/2".....	49
Kardangelen 3/4".....	55
Kardangelen 1".....	58
Kardangelen für Schlagschrauber 1/2".....	61
Kardangelen für Schlagschrauber 3/4".....	63
Kardangelen für Schlagschrauber 1".....	65
Keil mit Loch.....	114
Kesselsteinhammer.....	87
Kettenrohrzange leichte Ausführung.....	77
Kettenrohrzange schwere Ausführung.....	77
Kisteneisen.....	115
Klappspaten.....	110
Klauenhammer.....	87
Klauenschlüssel.....	41
Knarre 1/4".....	44
Knarre 1/2".....	47
Knarre 3/4".....	53
Knarre 1".....	57
Knarrenkasten 1/4".....	45
Knarrenkasten 1/2".....	50
Knarrenkasten 3/4".....	56
Knarrenkasten 1".....	59
Knarrenschlüssel 12-Kant.....	42
Knarrenschlüssel 6-Kant.....	42
Kombizange.....	77
Kombizange isoliert.....	77
Kombizange verstellbar.....	77
Körner.....	94
Kraft-Seitenschneider.....	78
Kraft-Seitenschneider isoliert.....	78
Kreuzhacke.....	109
Kreuzmeißel 6-Kant.....	91
Kreuzmeißel oval.....	91
Kreuzschlitzschraubendreher.....	68
Kreuzschlitzschraubendreher-Einsatz 1/2".....	51
Kunststoffhammer.....	89
Kupplungsschlüssel A-B-C.....	34

K	Seite
Kupplungsschlüssel B-C.....	34
Kurbel 1/2".....	49
Kurbel 3/4".....	55
Kurbel 1".....	59
L	
Loch-/Durchschläger.....	86
M	
Maschinenhammer, amerikanische Form.....	87
Maulschlagschlüssel.....	22
Maulschlagschlüssel in Zoll.....	23
Maulzugschlüssel.....	26
Maulzugschlüssel in Zoll.....	26
Maurerhammer.....	87
Maurerhammer amerikanische Form.....	87
Maurerkelle.....	101
Maurermeißel.....	91
Meißelhandgriff.....	92
Messschieber Kunststoff.....	122
Messschieber Messing.....	122
Messer.....	98
Messer verstärkte Ausführung.....	98
Minenhammer.....	85
Minenhammer mit Fiberglasstiel.....	85
Monkey Wrench.....	76
Montagedorn.....	95
Montagemaulschlüssel mit Dorn.....	29
Montagemaulschlüssel mit Dorn gekröpft.....	30
Montagemaulschlüssel mit Dorn gekröpft in Zoll.....	30
Montagemaulschlüssel mit Dorn in Zoll.....	29
Montageringschlüssel mit Dorn gekröpft.....	31
Montageringschlüssel mit Dorn gekröpft in Zoll.....	31
Montierreisen.....	117
Montierhebel.....	117
Montierhebel schwere, gekröpfte Ausführung.....	117
Montierspitze.....	95
Mutterndreher.....	41
Mutterndreher in Zoll.....	41
N	
Nadeln.....	125
Nageleisen.....	115
Nasenkeil.....	114
O	
Ölpumpe.....	126
P	
Pinselfbürste.....	105
Pinzette aus Kunststoff.....	125
Pinzette spitz.....	125
Pinzette stumpf.....	125
Plattenschaber.....	102
Profil-Schraubendreher.....	70
Q	
Quergriff 1/4".....	44
Quergriff 1/2".....	48
Quergriff 3/4".....	54
Quergriff 1".....	58
Quergriff für Sechskant-Steckschlüssel.....	38

Q	Seite	S	Seite
Quergriff für Sechskant-Steckschlüssel doppelseitig.....	39	Schraubendrehereinsatz mit 6-Kant Stift lange Form 1/2".....	51
R		Schraubendreher-Einsätze für Schlagschrauber mit 6-Kant Stift 1/2".....	60
Randschaufel.....	110	Schraubendreher-Einsätze für Schlagschrauber mit 6-Kant Stift 3/4".....	62
Rechen.....	111	Schraubendreher-Einsätze für Schlagschrauber mit 6-Kant Stift 1".....	64
Reduzierstück 1/2".....	48	Schraubendrehereinsatz-Kästen 1/2".....	52
Reduzierstück 3/4".....	54	Schraubendreher-Sätze.....	69
Reduzierstück 1".....	58	Schraubstock.....	121
Reduzierstück für Schlagschrauber 1/2".....	61	Schraubzwinge.....	121
Reduzierstück für Schlagschrauber 3/4".....	63	Schraubzwinge, Spann.....	121
Reduzierstück für Schlagschrauber 1".....	65	Schraubzwinge, Tiefspann.....	121
Reduzierstück für Schlagschrauber 1.1/2".....	66	Schrotmeißel.....	88
Reduzierstück für Schlagschrauber 2.1/2".....	66	Schrubber.....	104
Reinigungswerkzeug.....	102	Sechskant Kugelkopfschraubendreher.....	70
Reissnadel.....	93	Sechskant Kugelkopfstiftschlüssel mit T-Griff.....	74
Responder RA, Handleuchte.....	136	Sechskant Steckschlüsseleinsatz 1/4".....	44
Ringmaulschlüssel.....	15	Sechskant Steckschlüsseleinsatz 1/2".....	46
Ringmaulschlüssel extra lang.....	17	Sechskant Steckschlüsseleinsatz 3/4".....	53
Ringmaulschlüssel extra lang Sätze.....	17	Sechskant Steckschlüsseleinsatz 1".....	57
Ringmaulschlüssel gekröpft.....	17	Sechskant Steckschlüsseleinsatz 1/2" in Zoll.....	46
Ringmaulschlüssel gekröpft Sätze.....	17	Sechskant Steckschlüsseleinsatz 3/4" in Zoll.....	53
Ringmaulschlüssel in Zoll.....	16	Sechskant Steckschlüsseleinsatz 1" in Zoll.....	57
Ringmaulschlüssel in Zoll Satz.....	16	Sechskant Steckschlüsseleinsatz 1/2" lange Ausführung.....	47
Ringmaulschlüssel-Sätze.....	15	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1/2".....	60
Ringschlagschlüssel.....	24	Sechskant Steckschlüsseleinsatz für Schlagschrauber 3/4".....	62
Ringschlagschlüssel gekröpft.....	25	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1".....	64
Ringschlagschlüssel in Zoll.....	25	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1.1/2".....	66
Ringzugschlüssel.....	27	Sechskant Steckschlüsseleinsatz für Schlagschrauber 2.1/2".....	66
Ringzugschlüssel in Zoll.....	27	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1/2" lange Form.....	60
Ringzugschlüssel Satz.....	28	Sechskant Steckschlüsseleinsatz für Schlagschrauber 3/4" lange Form.....	62
Rohrabschneider.....	121	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1" lange Form.....	64
Rohrschlüssel verstellbar.....	76	Sechskant Steckschlüsseleinsatz für Schlagschrauber 1.1/2" lange Form.....	66
Rollgabelschlüssel.....	76	Sechskant Stiftschlüssel Sätze.....	71
Roststecher.....	100	Sechskant Stiftschlüssel.....	72
Rückschlagfreie Hämmer.....	89	Sechskant Stiftschlüssel in Zoll.....	72
Rundbürste.....	104	Sechskant Stiftschlüssel lange Ausführung.....	72
Rundfeile.....	122	Sechskant Stiftschlüssel mit Kugelkopf.....	73
Rundzange.....	78	Sechskant Stiftschlüssel mit Kugelkopf lange Ausführung.....	73
S		Sechskant Stiftschlüssel mit Kugelkopf Sätze.....	71
Sägeblatt.....	120	Sechskant Stiftschlüssel mit T-Griff.....	73
Schaber.....	100	Sechskant Stiftschlüssel mit T-Griff lange Ausführung.....	73
Schaber konkav.....	100	Sechskant Stiftschlüsselschraubendreher gewinkelt.....	70
Schaber mit Stiel.....	100	Sechskant Stiftschlüsselschraubendreher mit geradem Griff.....	70
Schaberspachtel.....	99	Sechskant-Steckschlüssel.....	38
Schäckel.....	124	Sechskant-Steckschlüssel doppelseitig.....	39
Schieberklaue.....	35	Sechskant-Steckschlüssel gewinkelt.....	39
Schlegel.....	88	Sechskant-Steckschlüssel mit festem Quergriff.....	40
Schlitzeißel.....	92	Seegeringzange Form A.....	80
Schlosserhammer.....	84	Seegeringzange Form C.....	80
Schlosserhammer amerikanische Form.....	86	Seitenschneider.....	78
Schlosserhammer mit Fiberglasstiel.....	84	Setzhammer.....	86
Schlosser-Werkzeugkasten.....	138	Sichel.....	112
Schlüssel für Tankwagenventil.....	35	Sicherungsring für Hämmer.....	124
Schraubendreher-Bit 6-Kant.....	124	Sicherungsring für Schlagschrauber 1/2".....	61
Schraubendreher-Bit Kreuz (PH).....	124	Sicherungsring für Schlagschrauber 3/4".....	63
Schraubendreher-Bit Profil.....	124	Sicherungsring für Schlagschrauber 1".....	65
Schraubendreher-Bit Schlitz.....	124	Sicherungsring für Schlagschrauber 1.1/2".....	66
Schraubendreher-Einsatz 1/2".....	51	Sicherungsring für Schlagschrauber 2.1/2".....	66
Schraubendrehereinsatz mit 6-Kant Stift 1/2".....	51	Sicherungsstift für Schlagschrauber 1/2".....	61
Schraubendrehereinsatz mit 6-Kant Stift 3/4".....	56	Sicherungsstift für Schlagschrauber 3/4".....	63
Schraubendrehereinsatz mit 6-Kant Stift 1".....	59	Sicherungsstift für Schlagschrauber 1".....	65
		Sicherungsstift für Schlagschrauber 1.1/2".....	65
		Sicherungsstift für Schlagschrauber 2.1/2".....	65

S	Seite
Space-Eisen	114
Spachtel biegsam	98
Spachtel starr	98
Spachtelmesser	99
Spann-Schraubzwinde	121
Spaten	110
Spatengabel	111
Spezial-Universalschlüssel	37
Spezialverlängerung für Hahnenfußschlüssel 1/2"	42
Spitzhacke	109
Spitzkelle	101
Spitzmeißel	91
Splintentreiber	94
Splintentreiber starke Ausführung	95
Splintentreiber-Satz	95
Spritzkabinenschaber	99
Steinkeil	114
Stirnlampe UK 3AAA LED VIZION	132
Stirnlochschlüssel	35
Strickeisen/Strickwerkzeug	98

T	
Taschenlampe Handleuchte Responder RA	136
Taschenlampe Handscheinwerfer AccuLux EX SLE 15	135
Taschenlampe Mini Pocket Light Xenon	131
Taschenlampe UK 2AAA Penlight	131
Taschenlampe UK 4AA CPO	133
Taschenlampe UK 4AA eLED Zoom S	134
Taschenlampe UK 4AA EN Xenon	134
Taschenlampe UK 4AA ES,ET Xenon	135
Taschenlampen-Gürteltasche	134
Taschenlampen-Helmhalterung	134
Taschen-Messschieber aus Kunststoff	122
Taschen-Messschieber aus Messing	122
Telefonzange	79
Telefonzange isoliert	79
Telefonzange mit abgewinkelter Spitze	79
T-Gelenkschlüssel 1/2"	49
T-Gelenkschlüssel 3/4"	55
T-Gelenkschlüssel 1"	59
Tiefspann-Schraubzwinde	121
Topfbürste	104
Tragbare, handbetätigte Ölpumpe	126
T-Verlängerung 1/2"	49
T-Verlängerung 3/4"	55

U	
Universal-Faßschlüssel	37
Universal-Gürteltasche für Taschenlampe	136
Universalschlüssel	37

V	
Ventilhaken	35
Verbindungsvierkant 1/4"	45
Verbindungsvierkant 1/2"	48
Verbindungsvierkant 3/4"	54
Verbindungsvierkant 1"	58
Vergrößerungsstück 1/4"	45
Vergrößerungsstück 1/2"	48
Vergrößerungsstück 3/4"	54
Vergrößerungsstück für Schlagschrauber 1/2"	61
Vergrößerungsstück für Schlagschrauber 3/4"	63

V	Seite
Vergrößerungsstück für Schlagschrauber 1"	65
Verlängerung 1/4"	44
Verlängerung 1/2"	48
Verlängerung 3/4"	54
Verlängerung 1"	58
Verlängerung für Schlagschrauber 1/2"	61
Verlängerung für Schlagschrauber 3/4"	63
Verlängerung für Schlagschrauber 1"	64
Verschlagöffner	117
Verstellbare Kombizange	77
Verstellbarer Rohrschlüssel	76
Vielzweckschere	81
Vierkant Ahle	93
Vierkant-Griff 1/4"	45
Vierkant-Steckschlüssel gewinkelt	36
Vierkant-Stiftschlüssel	74
Vollkunststoff-Schiebeleiter	129
Vollkunststoff-Seilzugleiter	128
Vollkunststoff-Sprossen-Anlegeleiter	129
Vollkunststoff-Sprossen-Stehleiter	128
Vorschlaghammer	84
Vorschlaghammer mit Fiberglasstiel	84

W	
Wasserpumpenzange	78
Wasserpumpenzange innenliegendes Gewerbe	78
Werkstatt-Schraubendreher	68
Werkzeugkoffer leer	138
Werkzeugkasten Schlosserwerkzeugkasten	138
Winkeldorn	93
Winkelgriff 1/2"	49
Winkelgriff 3/4"	55
Winkelgriff 1"	59
Winkelschaber	99
Winkelschaber mit Griff	99
Winkelschraubendreher	74

Z	
Zangen-Satz	80
Zugdorn	95
Zugmesser	126
Zündkerzenbürste	104
Zylinderbürste	105

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Index

	Page		Page
A		C	
Adjustable combination plier.....	77	Convert coupler 1/2" to 3/4".....	48
Adjustable hook wrench.....	34	Convert coupler 3/4" to 1".....	54
Adjustable pipe wrench.....	76	Coupler 1/4".....	45
Adjustable wrench.....	76	Coupler 1/2".....	48
Axe.....	108	Coupler 3/4".....	54
		Coupler 1".....	58
B		Crate opener.....	117
Ball ended screw driver.....	70	Crimping plier.....	80
Ball pein hammer.....	86	Cross pein hammer.....	86
Bar for claw spanner.....	41	Cross slot screw driver.....	68
Bar for double ended socket wrench 6-point.....	39	Cross slot screw driver socket 1/2".....	51
Bar for socket wrench 6-point.....	38	Crow foot spanner 1/2".....	42
Barrel hook.....	117	Crowbar.....	116
Bending bar.....	117	Cup brush, tin bronze wire, curled.....	104
Bolt cutter.....	80	Cutoff hammer.....	88
Box wrench for extension.....	27	Cutting shear.....	81
Box wrench for extension Inch.....	27		
Brick towel.....	101	D	
Bricklayers hamme.....	87	Deck scraper.....	99
Bricklayers hammer american type.....	87	Deck scraper.....	102
Bricklayerschisel, 6-point.....	91	Deck scraper with handle.....	99
Broom, round wire.....	105	Deep tension clamp.....	121
Brush end, wire curled.....	105	Diagonal cutting plier.....	78
Brush, spark-plug cleaning, round wire.....	104	Diagonal cutting plier heavy duty.....	78
Brush, tin bronze wire, curled.....	104	Diagonal cutting plier heavy duty isolated.....	78
Brush, tube, wire curled.....	105	Double end box wrench offset.....	18
Bucket.....	121	Double end box wrench offset Inch.....	19
Bung wrench.....	37	Double end box wrench straight.....	20
Bung wrench, universal.....	37	Double end box wrench straight Inch.....	20
B-valve wheel wrench.....	35	Double end scriber.....	93
		Double ended socket wrench 6-point.....	39
C		Double face machinist hammer.....	87
Cape chisel, 6-point.....	91	Double open end wrench.....	10
Cape chisel, oval form.....	91	Double open end wrench Inch.....	11
Carbide drum opener.....	117	Double open end wrench small.....	12
Caulking tool.....	98	Draw knife.....	126
Center punch.....	94	Driftpin, barrel type.....	94
Chain hoist.....	127	Drill bit.....	126
Chain pipe wrench heavy duty.....	77	Drill bit set.....	126
Chain pipe wrench light pattern.....	77	Dust pan.....	110
Circlip plier for external rings.....	80		
Circlip plier for internal rings.....	80	E	
Clamp.....	121	Edging spade.....	110
Claw hammer.....	87	Electrician s screw driver.....	68
Claw spanner without bar.....	41	Extension bar 1/4".....	44
Clubhammer.....	86	Extension bar 1/2".....	48
Combination plier.....	77	Extension bar 3/4".....	54
Combination plier isolated.....	77	Extension bar 1".....	58
Combination wrench.....	15	Extensions.....	28
Combination Wrench extra long.....	17	Extreme powerdrives.....	89
Combination wrench Inch.....	16		
Combination wrench offset.....	17	F	
Concrete chisel.....	92	Face spanner.....	35
Construction box wrench offset.....	31	Firemensaxe.....	108
Construction box wrench offset Inch.....	31	Firemens hatchet made of CUBE with fiberglass handle.....	108
Construction wrench with pin.....	29	Firemens hook.....	109
Construction wrench with pin Inch.....	29	Flange spreader.....	126
Construction wrench with pin offset.....	30	Flange wedge.....	114
Construction wrench with pin offset Inch.....	30	Flat chisel, oval form.....	91
Convert coupler 1/4" to 1/2".....	45	Flat Double Open End Wrench.....	12
		Flat Double Open End Wrench Inch.....	12
		Flat file.....	122

F	Page
Flat nose plier.....	79
Flat scraper.....	99
Folding spade.....	110
Fork for guncotton.....	112
G	
Garden fork.....	111
Gas pipe plier.....	77
Gasket knife, round.....	115
Gasket knife, straight.....	115
H	
Hack saw blade.....	120
Hack saw frame.....	120
Halfround file.....	122
Hammer with fiberglass handle.....	84
Hammer with hickory handle.....	84
Hand guard for chisel, grooved.....	92
Handlamp Responder.....	136
Hand pick.....	109
Hand saw.....	120
Hand saw, heavy duty.....	120
Hand spot light.....	135
Hand style scraper.....	100
Handbroom, tin bronze wire, curled.....	105
Handbrush, tin bronze wire, curled.....	105
Hatchet.....	108
Hay fork.....	111
Hearing needle.....	125
Hearing needle with ball end.....	125
Hedge shears.....	111
Hex key.....	72
Hex key Inch.....	72
Hex key long pattern.....	72
Hex key screw driver.....	70
Hex key screw driver 90° angled.....	70
Hex key with ball end.....	73
Hex key with ball end and t-handle.....	74
Hex key with ball end long pattern.....	73
Hex key with t-handle.....	73
Hex key with t-handle long pattern.....	73
Hinged handle 1/4".....	44
Hinged handle 1/2".....	48
Hinged handle 3/4".....	54
Hinged handle 1".....	58
Hinged handle with t-handle 1/2".....	49
Hinged handle with t-handle 3/4".....	55
Hinged handle with t-handle 1".....	59
Hoe.....	108
Hook wrench.....	34
Hose coupling wrench A-B-C.....	34
Hose coupling wrench B-C.....	34
Hydraulic palett truck.....	127
I	
Impact convert coupler 1/2" to 3/4".....	61
Impact convert coupler 3/4" to 1".....	63
Impact convert coupler 1" to 1.1/2".....	65
Impact extension bar 1/2".....	61
Impact extension bar 3/4".....	63
Impact extension bar 1".....	64
Impact reducer 1/2" to 1/4".....	61

I	Page
Impact reducer 3/4" to 1/2".....	63
Impact reducer 1" to 3/4".....	65
Impact reducer 1.1/2" to 1".....	66
Impact safety pin 1/2".....	61
Impact safety pin 3/4".....	63
Impact safety pin 1".....	65
Impact safety pin 1.1/2".....	65
Impact safety pin 2.1/2".....	65
Impact safety ring 3/4".....	63
Impact safety ring 1".....	65
Impact snap ring 1/2".....	61
Impact snap ring 3/4".....	63
Impact snap ring 1".....	65
Impact snap ring 1.1/2".....	66
Impact snap ring 2.1/2".....	66
Impact socket 6-point 1".....	64
Impact socket 6-point 1" long pattern.....	64
Impact socket 6-point 1.1/2".....	66
Impact socket 6-point 1.1/2" long pattern.....	66
Impact socket 6-point 1/2".....	60
Impact socket 6-point 1/2" long pattern.....	60
Impact socket 6-point 3/4".....	62
Impact socket 6-point 3/4" long pattern.....	62
Impact socket with hexagon bit 1".....	64
Impact socket with hexagon bit 1/2".....	60
Impact socket with hexagon bit 3/4".....	62
Impact universal joint 1".....	65
Impact universal joint 1/2".....	61
Impact universal joint 3/4".....	63
J	
Joint towel.....	101
K	
Knife.....	98
Knife, strong pattern.....	98
L	
Long handle open end wrench.....	26
Long handle open end wrench Inch.....	26
Long nose plier with cutter.....	79
Long nose plier with cutter and 45° angled top.....	79
Long nose plier with cutter isolated.....	79
M	
Machinist hammer with fiberglass handle.....	84
Machinist hammer with hickory handle.....	84
Machinist tool kit.....	139
Mallet.....	88
Manhole-hook.....	37
Manhole-hook, strong pattern.....	37
Manual portable oil pump.....	126
Manure fork.....	111
Minehammer with fiberglass handle.....	85
Minehammer with hickory handle.....	85
Miners pick.....	109
Monkey wrench.....	76
Multipurpose snip.....	81
N	
Nail puller.....	115
Needle.....	125

N	Page
Nosekey.....	114

O	Page
Offset handle 1".....	59
Offset handle 1/2".....	49
Offset handle 3/4".....	55
Offset pin.....	93
Offset screw driver.....	74

P	Page
Parallel vice.....	121
Pick.....	109
Pick scraper.....	102
Pin Punch.....	94
Pin punch set.....	95
Pin punch, heavy duty.....	95
Pin wrench 6-point.....	41
Pin wrench 6-point Inch.....	41
Pin, straight.....	95
Pincer.....	79
Pincer heavy duty.....	79
Pinch bar.....	115
Pinch bar with edge and ball.....	116
Pinch bar with point and ball.....	116
Pinch bar with point and claw.....	116
Pinch bar with point and edge.....	116
Pin-Set.....	94
Pipe cutter.....	121
Plasters towel.....	101
Pocket-caliper made of brass.....	122
Pocket-caliper made of plastic.....	122
Point chisel, 6-point.....	91
Pointed towel.....	101
Powerdrive dead blow.....	89
Powerdrive dead blow with compact synthetic tops.....	89
Puch, heavy duty.....	93
Punch.....	93
Punch hammer.....	88
Punch, machinist extra strong.....	94

R	Page
Railroad pick.....	109
Rake.....	111
Ratchet 1/4".....	44
Ratchet 1/2".....	47
Ratchet 3/4".....	53
Ratchet 1".....	57
Ratchet with square coupler 1/4".....	44
Ratchet with square coupler 1/2".....	47
Ratchet with square coupler 3/4".....	53
Ratchet with square coupler 1".....	57
Ratchet wrench 12-point.....	42
Ratchet wrench 6-point.....	42
Reaping hook.....	112
Reducer 1".....	58
Reducer 1/2" to 1/4".....	48
Reducer 3/4" to 1/2".....	54
Responder Handlamp.....	136
Riveter.....	86
Round file.....	122
Round nose plier.....	78
Round point shovel.....	110

R	Page
Rubber mallet.....	88
Rubber pusher made of wood with handle.....	105
Rust scraper.....	100

S	Page
Scaling hammer.....	87
Scoop shovel.....	110
Scraper.....	100
Scraper, concave.....	100
Scraper, flexible blade.....	99
Scraper, floor.....	102
Scraper, wide, stiff blade.....	101
Screw driver.....	68
Screw driver bit, 6-point.....	124
Screw driver bit, PH.....	124
Screw driver bit, Profile.....	124
Screw driver bit, slot.....	124
Screw driver socket sets 1/2".....	52
Screw driver socket with hexagon bit.....	56
Screw driver socket with hexagon bit 1/2".....	51
Screw driver socket with hexagon bit 1/2" long pattern.....	51
Screwdriver socket 1/2".....	51
Scrubbing broom, round wire.....	104
Securing for hammers.....	124
Set of box wrenches for extension.....	28
Set of combination wrenches.....	15
Set of combination wrenches extra long.....	17
Set of combination wrenches Inch.....	16
Set of combination wrenches offset.....	17
Set of double end box wrench offset.....	18
Set of double end box wrench offset, Inch.....	19
Set of double open end wrenches.....	10
Set of double open end wrenches Inch.....	11
Set of double open end wrenches small.....	12
Set of pliers.....	80
Sets of hex keys.....	71
Sets of screw drivers.....	69
Setting punch.....	95
Shackle.....	124
Ship scraper.....	100
Single box wrench.....	21
Single box wrench Inch.....	21
Single open end wrench.....	13
Single open end wrench Inch.....	14
Sledge hammer with fiberglass handle.....	85
Sledge hammer with hickory handle.....	85
Sliding t-handle 3/4".....	54
Sliding t-handle 1".....	58
Sliding T-wrench 1/2".....	49
Sliding t-wrench 3/4".....	55
Socket 6-point 1".....	57
Socket 6-point 1/2".....	46
Socket 6-point 1/2" Inch.....	46
Socket 6-point 1/4".....	44
Socket 6-point 3/4".....	53
Socket 6-point Inch 1".....	57
Socket 6-point long pattern 1/2".....	47
Socket set 1/4".....	45
Socket set 1/2".....	50
Socket sets 3/4".....	56
Socket sets 1".....	59
Socket wrench L-type 6-point.....	39

S	Page
Socket wrench, 6-point.....	38
Socket wrench, 6-point with t-handle.....	40
Space-wedge.....	114
Spatula.....	99
Spatula, flexible blade.....	98
Spatula, stiff blade.....	98
Special bung wrench.....	37
Special extension for crowfoot spanner 1/2".....	42
Speed handle 1/2".....	49
Speed handle 3/4".....	55
Speed handle 1".....	59
SPI Holder non rebound.....	89
Splitting chisel, flat.....	92
Spray booth scraper.....	99
SPS Holder non-sparking.....	89
Square blade awl.....	93
Square key.....	74
Square point handle 1/4".....	45
Square point shovel.....	110
Square point socket L-type.....	36
Stone wedge.....	114
Striking box wrench.....	24
Striking box wrench Inch.....	25
Striking box wrench offset.....	25
Striking open end wrench.....	22
Striking open end wrench Inch.....	23
Swedish plier.....	76
Swedish plier with mole 90° angled.....	76
T	
Taper punch.....	95
Tension-clamp.....	121
T-handle 1/4".....	44
T-handle 1/2".....	48
Thread-cleaning pin.....	95
Tin snip.....	81
Tin snip heavy duty.....	81
Tool case made of Polypropylen.....	139
Torque wrench 1/2".....	49
Torx-screw driver.....	70
Triangle socket 1/2".....	36
Triangle tube socket.....	36
Triangular scrape	100
Tweezer, flat nose.....	125
Tweezer, made of plastic.....	125
Tweezer, neat.....	125
Tyre levers.....	117
Tyre levers, heavy duty offset.....	117

U	
Universal joint 1/4".....	45
Universal joint 1/2".....	49
Universal joint 3/4".....	55
Universal joint 1".....	58
V	
Valve wheel hook.....	35
Valve wheel hook.....	35
Valve wheel wrench.....	35
W	
Waterpump plier.....	78
Waterpump plier with box joint.....	78
Wedge with hole.....	114
Wheel brush, tin bronze wire, curled.....	104
Wire brush, tin bronze wire, curled.....	104
Wire stripping plier.....	80
Wooden mallet.....	88
Wrecking bar.....	115
Wrench for valve of tanktruck.....	35

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Delivery and ordering conditions

I. Decisive conditions

1. The legal relationships for all supplies and services provided to companies (customers) by Dönges GmbH & Co. KG (supplier) are based upon these conditions and any other agreements that have been made.
2. Changes and additions must be made in writing. Other general business conditions shall not apply, even if they have not been expressly objected to in isolated cases. These delivery and ordering conditions also apply to all future supplies and services provided to the customer by the supplier, even if they have not been expressly re-agreed. They only apply to companies in the sense of § 14 of the BGB. The obligations in § 312e para. 1 no. 1 to 3 of the BGB are excluded.

II. Ordering

1. Orders and acceptance pertaining to delivery agreements, general agreements and requests for delivery and changes and additions thereto must be made in writing. Requests for delivery can also be submitted by means of remote data transmission.
2. The supplier's products are subject to change and non-binding. Procurement agreements, quality guarantees and service life guarantees must be made in writing.
3. Unless otherwise agreed, delivery must be made uninsured at the customer's cost and risk to the place of acceptance or use that has been or will be specified by the customer. The risk is transferred to the customer when the goods are handed over to the person who is responsible for transport. This also applies if the supplier has a debt to be discharged at the customer's domicile.
4. In the event of an obligation to bring or send, the supplier is entitled to determine the means of transport and the route. Differing agreements must be made in writing.

III. Prices and payments

1. All prices specified by the supplier exclude VAT at the applicable rate. The prices do not include the cost of packaging, delivery and insurance, which must be paid for separately by the customer unless the supplier expressly confirms in writing that the cost thereof will be covered.
2. Unless otherwise expressly agreed, payment will be made within 10 calendar days of the date of the invoice with 2% discount, or net within 30 days of receipt of the invoice. This also applies to the receipt of early deliveries. The supplier is entitled to demand concurrent delivery at any time, without giving reasons.
3. Payment will be made by bank transfer or cheque. Cheques will only be accepted as conditional payment.
4. If the delivery is defective, the customer is entitled to retain a proportional amount of the payment until the delivery has been properly fulfilled.
5. The supplier is entitled to transfer his claims against the customer or have them collected by third parties, without obtaining written agreement from the customer beforehand.
6. The customer is only entitled to offset counter-claims that have been legally ascertained, concern a counter-demand that is to be adjudicated upon, are undisputed by the supplier or concerning which the supplier has expressly agreed to the offsetting in writing. The customer also only has the right to retain payment in the cases mentioned in clause 1.
7. No restrictions are placed on the supplier's payment retention and offsetting rights. The legal regulations apply.

IV. Confidentiality

1. The parties to the contract are obliged to treat all non-public commercial and technical details that they learn about via the business relationship as confidential. Drawings, models, templates, samples and similar objects must not be handed to unauthorised third parties or made otherwise available. The copying of such objects is only permitted within the scope of company requirements and copyright regulations. These obligations continue beyond the end of the supply relationship. Sub-suppliers shall be obligated by the supplier accordingly.
2. The parties to the contract may only use the business relationship for the purpose of advertising if written approval is obtained beforehand.

V. Delivery dates and periods, delivery modalities

1. Agreed deadlines and periods are only binding if they have been confirmed in writing by the supplier.
2. A confirmed delivery date is subject to the reservation that the supplier has obtained correct, complete and on-time delivery itself. If the supplier fails to deliver to the vendor, both parties are entitled to withdraw the contract. The supplier is not liable (section XI) in the case of clauses 1 and 2 only if the defective, delayed or omitted delivery from its own supplier is not the result of an infringement of obligations by the supplier.
2. Unless otherwise agreed in writing, on-time provision of the goods for dispatch (in the event of an obligation involving the dispatch of what is owed), for delivery (in the event of an obligation that the debtor has to perform at the creditor's address) or for collection (in the event of a debt to be collected at the debtor's address) and appropriate notification to the customer is decisive for adherence to the delivery date or delivery period.
3. Goods that are delivered early must be accepted by the customer. The right to return at the supplier's cost has not been agreed, and is subject to formal written agreement between the parties. If the customer stores the goods until the agreed delivery date, he must bear all of the costs that are incurred. Storage shall take place at the customer's risk.
4. Partial deliveries are permitted, provided that the customer is not unreasonably disadvantaged as a result.

VI. Late delivery

If late delivery occurs as a result of simple negligence, the customer's claim for compensation is limited to 5% of the order value. Provided that there are no special regulations in this section, section XI also applies with regard to liability for late delivery compensation.

VII. Force majeure

Acts of God, industrial disputes, riots, official actions and other unforeseen, unavoidable and serious events free the contracted parties for the duration of the problem and for the scope of the effect thereof on the work obligations. This also applies if these events occur at a point in time when the affected party to the contract is behind schedule. The parties to the contract are obliged to provide the required information without delay (within reason) and adapt their obligations to the changed circumstances in good faith.

VIII. Quality and documentation

Changes to the subject of the delivery do not require prior written permission from the customer if they have been requested by the customer or are appropriately relevant to the state of technology.

IX. Deficiencies, deficiency notifications and notification deadlines

1. § 377 HGB applies unrestrictedly between the parties with the resulting obligations for the customer's received goods checking. The supplier's outgoing goods checking is not a substitute for the customer's received goods checking, which the customer is obliged to carry out as per § 377 of the HGB.
2. The customer is obliged to provide notification of deficiencies relating to dispatch and discrepancies in the accompanying papers and all other deficiencies within two working days of receipt, provided that they become evident. The notification deadline for deficiencies that become evident during a proper examination is seven days after receipt, and seven days after discovery for concealed deficiencies.
3. The goods provided by the supplier are free of material defects if their characteristics are within the generally recognised and production-related tolerances.

X. Warranty rights

1. If the goods prove to be defective, the customer can demand the following (Section XI remains unaffected) if the relevant legal prerequisites exist and nothing else has been agreed:
 - a) The customer's warranty rights are restricted to supplementary performance. If the supplementary performance is not provided, the customer has the option of reducing the payment or withdrawing from the contract.
 - b) The choice between defect remedying or subsequent delivery will be made at the supplier's discretion. Defect remedying and subsequent delivery shall always take place on a goodwill basis and without recognition of a legal obligation.
 - c) If the customer exercises his right to choose, his claim for supplementary performance will be restricted to the selected type of supplementary performance until this variant proves to be impossible or the supplier refuses to carry out the selected type of supplementary performance. This does not affect the purchaser's right to assert a price reduction, withdrawal or compensation under the legal prerequisites as a result of failure to provide supplementary performance.
 - d) In the event of an infringement of obligations beyond the scope of the delivery of defective goods (e.g. an explanation, advice or examination obligation), the customer can demand compensation for the resulting consequential damage and the consequential damage that the customer has to pay to his own customer in accordance with section XI Consequential damage is the damage that the customer has suffered to other legally protected interests than the goods themselves as a result of delivery of defective goods.
 - e) If the customer asserts compensation claims due to a defect, the regulations in section XI apply as well as this section.
2. The regulations concerning contractor recourse as per § 478 BGB are unaffected by the regulation in section I above.
3. The customer must make the parts that are to be replaced by the supplier available to the supplier without delay upon request, and at the supplier's cost.

4. Deficiency claims do not exist if the fault is attributable to failure to follow operating, maintenance or installation instructions, unsuitable or improper use, defective or negligent handling and natural wear, or intervention in the subject of supply by the customer or third parties.

5. If the customer asserts a claim for supplementary performance or exercises his entitlement to withdraw from the purchase agreement or reduce the purchase price due to a material defect, his claim for supplementary performance or repayment of the purchase price shall come under the statute of limitations.

- in four years, if the subject of the purchase exists in a building or an object that has been used for a building in accordance with its normal purpose of use and has caused the deficiency,
- otherwise after 12 months.

6. Clause 5 does not affect the statute of limitations of repayment claims in accordance with § 479 BGB. The legal regulations also apply to the statute of limitations, particularly regarding the start of the statute of limitations. This regulation in section X number 1b clause 2 remains unaffected.

7. If defective deliveries are made, this section X shall not affect customer claims under the terms of the product liability act, for non-permitted action or for carrying out business without an order. Quality and service life guarantees must be formally identified as such individually in writing.

XI. Liability

1. A prerequisite for the supplier obligation to pay compensation is that the supplier was to blame, or the blame for the damage that was caused is attributable to the supplier. The statute of limitations regulation in § 438 of the BGB (German Civil Code) also applies to compensation for damage suffered by the customer to other legally protected customer interests (e.g. property, persons etc.) belonging to the customer or third parties as a result of the deficiency, provided that § 438 of the BGB basically applies to the agreement. Section X.5 and X.6 clauses 1 and 2 (particularly duration of statute of limitations, beginning of statute of limitations etc.) apply accordingly. The following clauses in this section must be observed regarding the reason for and the scope of liability.

2. The supplier is unrestrictedly liable for non-accidental injuries caused by the supplier. The supplier is also liable for compensation only in the event of deliberate or grossly negligent obligation violations by himself, his legal representatives or by persons who the supplier uses to fulfil his obligations. In the event of slightly negligent violation of obligations by the above-mentioned persons, the supplier is only liable for compensation if the infringement represents a violation of important contractual obligations. A important contractual obligation in the above-mentioned sense is an obligation that makes proper fulfilment of the agreement possible at all, and adherence to which the contractual partner can and does regularly rely on. In the event of slight negligence, the level of liability is restricted to the damage that is typical for this type of agreement.

3. If claims are made from the customer due to non-negotiable liability to third parties regardless of blame, the supplier is only liable to the customer to the extent of his liability to the customer in accordance with legal regulations or the terms of these conditions of sale.

The principles of § 254 of the BGB apply accordingly for compensation paid between the customer and the supplier. This also applies in the event of direct supplier claims.

4. The obligation to pay compensation does not apply if the customer has effectively restricted his liability to his customers. In this case the customer will also strive to agree liability restrictions in favour of the supplier to a legally permissible extent.

5. Claims made by the customer are excluded if the damage is attributable to the violation of operating, maintenance or installation instructions, unsuitable or improper use, defective or negligent actions, natural wear or defective repairs by the customer.

6. The customer will inform and consult the supplier without delay if he wishes to make use of the above-mentioned regulations. He must give the supplier the opportunity to investigate the damage case. The parties to the contract will agree on the actions to be taken, particularly in the event of compensation negotiations.

7. The liability restrictions and exclusions in accordance with clauses 1 to 6 of this section apply to the same extent in favour of the supplier's legal representatives, management and non-management employees, other parties involved in fulfilment and subcontractors.

XII. Protection rights

1. The supplier is liable for claims resulting from contractual use of the subject of the supply for violation of protection rights and patent registrations (patents), only within the scope of the legal regulations, taking the liability regulations in these conditions of sale into consideration (section XI).

2. In particular, the supplier does not release the customer and his customers from all claims resulting from the use of such protection rights if he is not liable as per clause 1.

3. In particular, the supplier is not liable provided that the subjects of the supply have been manufactured in accordance with customer drawings, models or equivalent other descriptions or specifications that have been handed over by the customer, and does not know that protection rights have been violated or does not have to know in connection with the products that he has developed.

4. The parties to the contract are obliged to notify each other without delay about violation risks and alleged violations that become known, and give each other the opportunity to amicably counteract the violation(s) accordingly.

5. If requested to do so by the supplier, the customer will provide notification of the use of public and non-public supplier patents, licensed patents and patent registrations for the subject of the delivery.

6. If the supplier is liable as per clauses 1 to 5 and nothing else has been expressly agreed in writing, the supplier is only liable for patent violations that occur in Germany.

XIII. Contractual penalties, lump sum compensation payments

1. Irrespective of the type of damage (deficiency claims, compensation instead of or in addition to the services, product liability etc.) the customer must specifically bill for the damages that he has suffered. No flat rate has been agreed for compensation claims, and no contractual penalties have been agreed between the parties. Flat compensation rates and contractual penalties can only be agreed in individual contracts and must be made in writing.

XIV. Title retention

1. The supplier reserves ownership of all goods that he supplies until full payment has been received; all deliveries are considered to be one continuous delivery in this respect. For open accounts, retained ownership is considered to be a safeguard for a balance request.

2. If the customer combines the goods with other objects to create a uniform object and the other object is considered to be the main product, the customer is obliged to transfer proportional co-ownership to the supplier if the main object belongs to him. If the supplied goods are sold on by the customer, he thereupon transfers claims against his own customers resulting from the sale to the supplier together with all secondary rights until all supplier claims have been settled in full.

3. For well-justified reasons, the customer is obliged to provide notification of transfer to third party purchasers if requested to do so by the supplier, and provide the supplier with the required information and documents that are required to assert his rights.

4. The supplier will release the securities that he has retained if the total value thereof exceeds the claims that are being protected by more than 10%.

XV. Take-back of goods

1. Goods will only be taken back if prior agreement is obtained from the supplier. The returned goods must be in a re-sellable condition and comply with the latest state of technology. The returned goods credit note will be drawn up at the original prices, minus a 10% processing fee. Costs incurred by third parties will be billed for separately.

XVI. General conditions

1. If one of the parties ceases to make payments, insolvency proceedings are started or private conciliation proceedings are applied for, the other party is entitled to withdraw from the contract for the non-fulfilled part.

2. If a term of these conditions and any other agreements that have been made is ineffective or becomes ineffective, the validity of the remainder of the contract is not affected. The parties to the contract are obliged to replace the ineffective term with a regulation that comes as close as possible to providing the same financial result.

3. The laws of the Federal Republic of Germany exclusively apply. The use of the United Nations convention of 11.04.1980 concerning contracts involving international sales is excluded.

4. The place of fulfillment will be in accordance with legal regulations. Differing agreements can only be made in individual contracts and must be made in writing.

5. The place of jurisdiction for all legal proceedings is the business headquarters of the supplier, providing that the customer is a merchant, juristic person in public law or separate asset under public law. The supplier is also entitled to claim from the customer at his general place of jurisdiction if he wishes to do so.

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