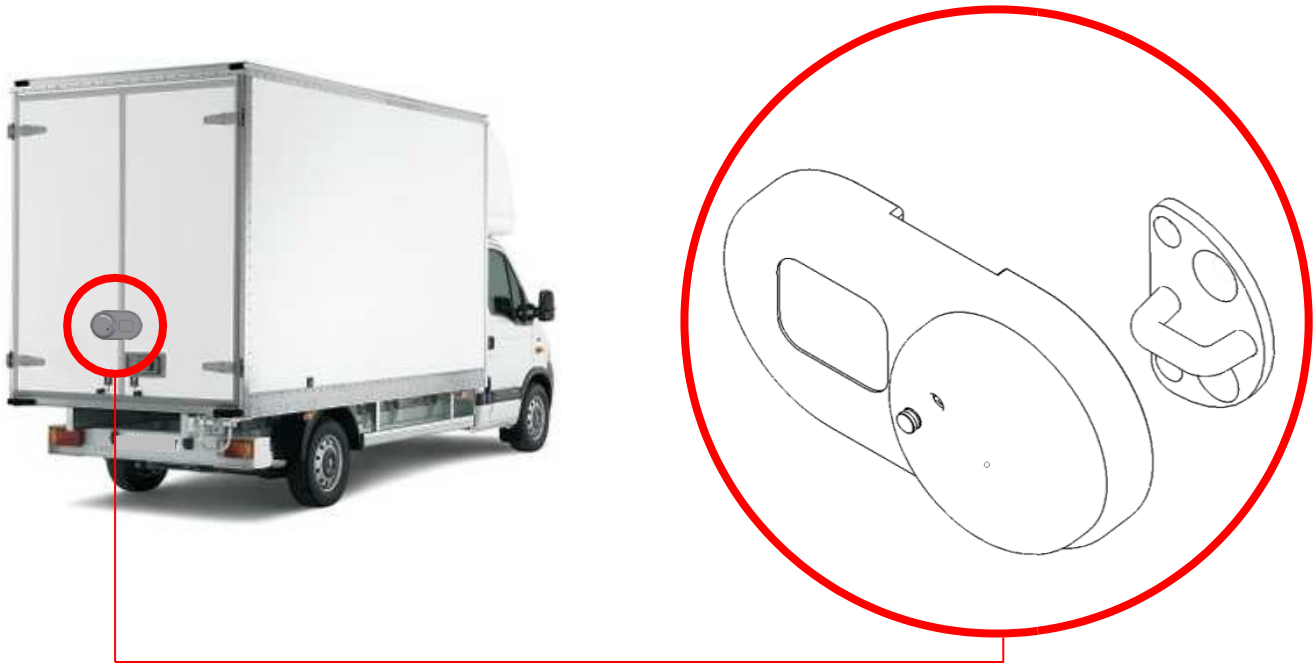


## External Locking Solution for Commercial Vehicles (BOX VAN)



### GATELOCK VAN LARGE For BOX VAN & TRUCKS GVLX

eXtrareinforcement lock version



The GatelockVan Large in the eXtra version has the same peculiarities of the standard series and in addition it reveals excellent performance in terms of resistance to cutting with a disc power tool.

Its resistance is linked to the integration in its body of 5 hard metal bars (tungsten carbide used for tools in removing metal shavings) with a diameter of 8mm and a length of 40mm. They are positioned in various strategic directions and are incorporated into both the upper and lower armor.

Hard metals are composite materials that consist of a hard material and a relatively soft binder, such as cobalt (Co). The characteristics of the hard metal are determined by the resistance to bending and breaking. The important parameters for optimizing the characteristics are represented by the share of the cobalt binder and the grain size of the hard metal phase.

Depending on the quality of m.d. the metal grain has a size of less than 0.2  $\mu\text{m}$  down to several microns ( $\mu\text{m}$ ). Cobalt fills the spaces in between. In order to meet the criteria in terms of toughness, the cobalt content can be up to 30%. To ensure maximum wear resistance, the cobalt content is reduced to a low percentage and the grain size decreased to the nano crystalline range.

Below is the detail of the quality adopted.

#### Qualità a micrograna



Immagine esempio

**CTS12D:** metallo duro a micrograna per la lavorazione ad asportazione truciolo di leghe di alluminio, materie plastiche rinforzate con fibre di carbonio e di vetro, materiali compositi, grafite; particolarmente idoneo per il rivestimento con diamante.

**CTS15D:** metallo duro a micrograna per la lavorazione ad asportazione truciolo di ghisa grigia, ghisa temprata e acciai non legati, metalli non ferrosi e materie plastiche.

**CTS18D:** qualità a micrograna speciale adatta alla lavorazione ad asportazione truciolo ad alta prestazione di acciaio, acciaio inox e alla lavorazione di materiali di difficile lavorabilità come titanio.

**CTS20D:** metallo duro a micrograna per la lavorazione ad asportazione truciolo universale di acciai legati e non legati, leghe di titanio e leghe a base di nickel. La migliorata tenacità riduce il rischio di scheggiature sul tagliente.

**CTS25D:** metallo duro a micrograna con elevata tenacità per la lavorazione di materiali di difficile lavorabilità e in condizioni sfavorevoli.

**CTS30D:** metallo duro a micrograna con tenacità molto elevata per condizioni di lavorazione difficili.

### Descrizione qualità p-line

Codice qualità CERATIZIT	Codice ISO	Codice USA	Legante [m %]	Densità [g/cm <sup>3</sup> ]	Durezza		Resistenza alla rottura		K <sub>IC</sub> * (Shetty) [MPa·m <sup>3/2</sup> ]
					HV30	HRA	[MPa]	[psi]	

#### Qualità di m.d. ultrafini

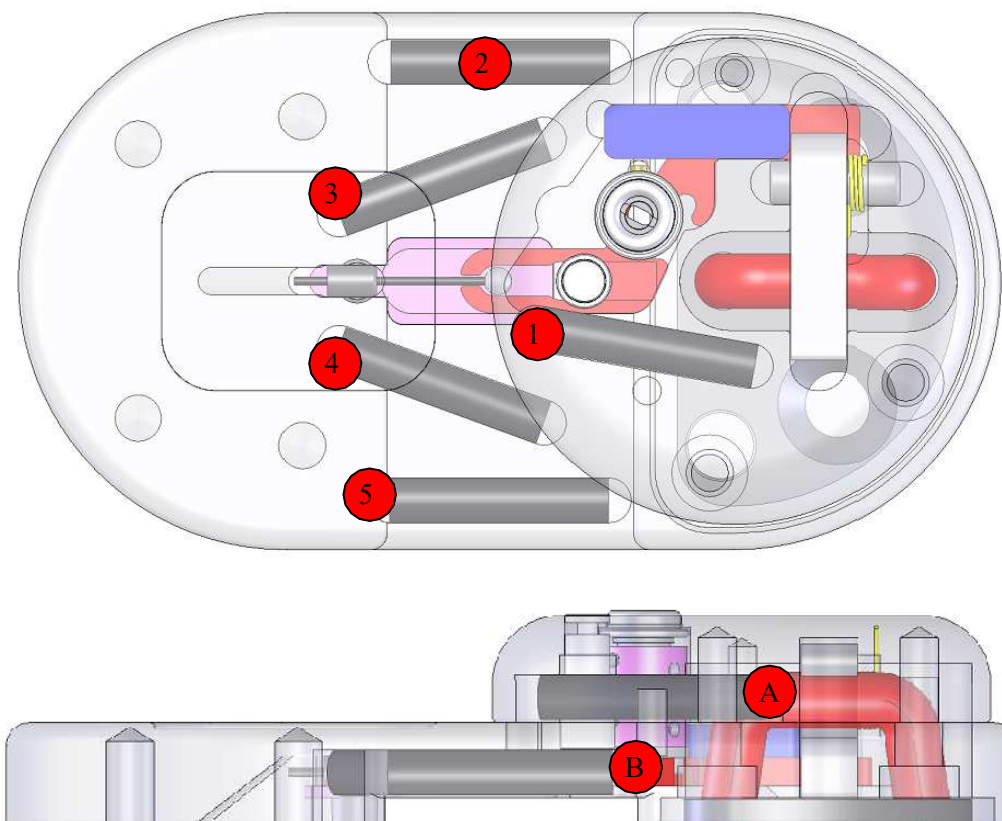
CTU08L	K10	C-2	4,2	15,05	2200	95,2	3700	536.600	8,4
TSF22	K10 – K20	C-2	8,2	14,55	1930	93,7	4400	638.800	9,2
TSF44	K10 – K20	C-2	12,0	14,10	1730	92,7	4600	667.000	9,8

#### Qualità a micrograna

CTS12D	K05 – K10	C-3	6,0	14,80	1820	93,1	3600	522.100	9,3
CTS15D	K10 – K30	C-3	7,5	14,70	1750	92,8	3700	536.000	9,5
CTS18D	K20 – K40	C-2	9,0	14,55	1590	91,9	3650	529.400	10,7
CTS20D	K20 – K40	C-2	10,0	14,38	1600	91,9	4000	580.100	10,4
CTS25D	K20 – K40	C-2	12,5	14,13	1540	91,5	4300	623.700	11,8
CTS30D	K30 – K40	C-2	15,0	13,84	1400	90,4	4300	623.700	13,2

The bars have a cylindrical shape which also favors their rotation on their axis under the action of the cutting disc, effectively neutralizing the action of abrasion. This feature, in addition to the intrinsic resistance, increases the attack times.

The indicative position of the bars inside the padlock is illustrated below. They are positioned where the attack is easier and more probable as well as damaging, while in other areas extra protection is inappropriate.



The dynamics of the cut, simulated on the bench and made with commonly available equipment, is characterized by the following aspects:

1. Use of battery powered power tool with features:

- Battery: 18 V | 3000 mAh | Li-Ion
- Disc diameter: 115 mm
- Max rpm: 8500 / min
- Cutting depth ma.: 28 mm

2. Abrasive disc 115x1.0x22.23 A60S - BF41 for steel, stainless steel;

3. Start of the cut of the steel armor: the cut proceeds with the times and characteristics of a common cut. In particular, there are sparks, fumes, dust and noise.



4. Once the bars are reached, the dynamics of the cut change. The sparks disappear and the emission of dust increases, the wear of the disc and the temperatures on the piece and on the disc. The disc slows down until it stops on its way the thermal protection of the motor and the battery. It is necessary to remove the disc and restart the cut.



5. The battery discharges quickly and requires replacement.

6. In the test it was not possible to cut the padlock and after about 10 minutes of attack the bars appear partially intact as in the condition illustrated in the following photo.



This type of padlock could be used to protect vehicles intended for the transport of goods of high economic value and in particularly critical areas for safety.