

HANDLING & SAFETY INSTRUCTIONS for DOLIUM® ONE-WAY KEGS

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2. OBJECTIVES This document describes how the Dolium® One-Way Kegs have to be treated during handling, storage, disposal, in order to ensure the proper use of the Dolium® One-Way Kegs and to guarantee the users safety under all circumstances. Dispack-projects NV cannot be held responsible in case of non-compliance to the prescribed Handling & Safety Instructions (ref. General Terms and Conditions). The Handling & Safety Instructions contain amongst other topics, the description of safety procedures, actions, points of attention and equipment that are necessary to protect people against accidents, injuries, suffocation by CO<sub>2</sub>, misuse and abuse of the polymer kegs, as well as those which are necessary to avoid negative impact on the environment while disposing Dolium® One Way kegs.

3. TRANSMITTING and SHARING OF INSTRUCTIONS Handling & Safety Instructions are part of the agreement governing the sale of the Products by Dispack-projects NV (the Seller) to her client (the Buyer). The Buyer expressly warrants that it will ensure proper transmission of such Handling & Safety Instructions to the Dolium® One-Way Kegs' end-users. For the avoidance of doubt, we recommend every user to check the national or other applicable legislation with regards to food packaging, transport and recycling obligations. The team of Dolium® One Way Kegs and Dispack-projects NV are available to her customers and clients for any information:

4. HANDLING & SAFETY INSTRUCTIONS

## 4. HANDLING & SAFETY INSTRUCTIONS



### 4.1. General Instructions : MUST DO's...<

**Keep away from children and consumers:** The Dolium® One Way Kegs are for professional purposes only and cannot be considered as toys or any other 2nd life purpose, not even when emptied and/or depressurized.

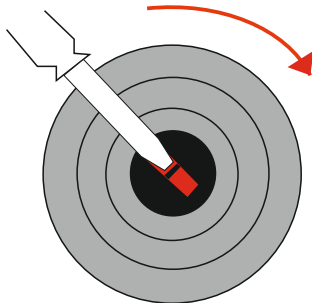
**Use the kegs only for their proper purpose:** The Dolium® One Way Kegs are recyclable pressurized PET kegs, for single trip use of food and beverages only, i.e. non-returnable, as alternative to stainless steel kegs for professional draught in the on-trade business.

**Use professional equipment for filling the kegs:** The Dolium® One Way Kegs are equipped with standard fitting systems as per customer's request, fully compatible with existing filling lines, and subject to adapted temperature and pressure settings.

**Use a drop cushion and handle the kegs with reasonable care:** it is strongly recommended to use drop cushion to protect the keg for resisting to dropping kegs up to 2,5 m.

**Use professional equipment for gas supply and gas pressure regulation:** the use of a well functioning gas regulator is mandatory for bringing the gas supply from high pressure down to the working pressure of maximum 3,5 bar or 50 psi.

**Use professional equipment for connecting and dispensing the kegs:** The Dolium® One Way Kegs are equipped with standard fitting systems as per customer's request and are full compatible with existing draught installations, conditional the necessary temperature and pressure settings have been respected and the required and legal safety features are present on the equipments.



**Depressurize emptied kegs as soon as possible:** after use, when emptied, kegs have still high residual pressure inside equal to the pressure at draught; it is strongly recommended to depressurize the kegs immediately by use of the integrated Pressure Relief Valve (PRV), preferably outside or at least in a well ventilated area. For more details: see 4.3 for gasses and Carbon-dioxide; see 4.8 for PRV user instructions.

**Store empty or filled kegs at 0°C < Storage Temperature < 35°C.**

The lower the temperature, the lower the pressure so the safer The lower the temperature, the better for beverage quality.



Keep away from direct sunlight or other heat sources whilst this can increase temperature and induce higher pressure inside the keg.

**Keep away from wind** by storing the kegs in a protective area

**Keep away from electrical equipment** or lighting bulbs.

**Keep away from animals.**



#### 4.1. General Instructions : DO NOT's...

**Do not connect without the use of a proper functioning gas regulator.**

**Do not over-pressurize kegs!** Keep pressure at maximum of 3, 5 bar – 50 psi. Too high pressure might result into burst of the container.

**Do not tamper the Spear** (keg valve system) or keg.

**Do not deliberately drop or impact** the spear, neck or keg.

**Keep away from cleaning agents** as alkaline, caustic hydroxides or soapy cleaning products with pH > 9, causing chemical embrittlement and risk to burst.

**Do not clean, repair, maintain or reuse** the Dolium® One Way Kegs.

**Do not pierce the flexible body** of the Dolium® One Way Kegs in any way: as the pressurized keg body is composed of flexible PET material, piercing will result into burst and might cause unsafe situations.

**Do not weaken or burn the keg** not even after use.

**Do not heat the empty or filled kegs** whilst this can increase temperature and as such also pressure inside the keg. Do not expose to temperatures > 50°C

**Do not climb stacked kegs** neither use kegs for construction purposes.



#### 4.2. Food Safety

The materials of which the assembled keg is composed, are compliant with the European directives and UL-FDA legislation for food purposes. Food Safety Declarations of the sourcing companies are available upon request at DISPACK-projects NV.

All parts in contact with beer, such as preforms, spear parts, springs... are certified individually and by Dispack-projects NV for EU and FDA compliance for food-stuff. The applicable alcohol level for migration test is minimal 15%.

Dolium® One-Way kegs offer a technical shelf-life equal to stainless steel, i.e. 6 months maximum.

#### 4.3. CO<sub>2</sub> - carbon dioxide or mixed (CO<sub>2</sub>/N<sub>2</sub>) gasses



Assure that all users are informed on CO<sub>2</sub> hazards and CO<sub>2</sub> user instructions. These are available at your CO<sub>2</sub> supplier. Read them well. CO<sub>2</sub> is not toxic, but is an odourless and colourless gas that is heavier than air. As such CO<sub>2</sub> replaces oxygen from the air, resulting in risk of suffocation at concentrations higher than 5%. CO<sub>2</sub> concentrations as from 9% are lethal.

Make sure the CO<sub>2</sub> is of food quality certified, with purity rate > 99,8%. Make sure CO<sub>2</sub> bottles can not drop. Fix them properly with a chain or similar.

Use CO<sub>2</sub> bottles only with an appropriate and well functioning Co<sub>2</sub> regulator and adjacent pressure relief valve. NEVER connect a Co<sub>2</sub> bottle directly to a keg as instant too high pressure would lead to immediate burst.

It is strongly recommended to install a CO<sub>2</sub> alarm, especially in very small or not well ventilated storage rooms or cellars..

## 4.4. Palletizing, Stacking and Storage of New Pressurized Empty and Filled Kegs

### 4.4.1. Palletization:

Good palletization is important in order to avoid the sliding or falling or de-stabilization. We recommend:

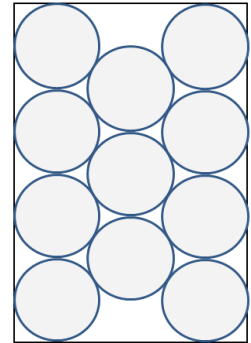
One Way pallets 1200 x 800 mm, 1000 kg loading, dried (DR) and heat treated (HT) for export purposes.

The top surface of the pallet should not be slippery to prevent the kegs from sliding off of the pallet. The bottom chimes of the Dolium® One Way Kegs are provided with a knurling pattern in order to prevent them from sliding.

The preferred palletization pattern as a self-blocking cross-stacked configuration is on pallet 1200 mm x 800mm: 11 kegs (4-3-4)

Less than 50mm over- or under-hang at each side of the pallet.

Beware of unstable stacking on pallets, fix them well by use of strapping. Strap the contour of the pallets in horizontal direction at each layer. If filled kegs are 3 layers high on 1 pallet, horizontal and vertical strapping are recommended to ensure stable transport.



### 4.4.2. Stacking and Storage

Storage of empty kegs: ATTENTION!

**Keep out of the wind** by protective storage: light-weight kegs, even palletized, are not wind-stable.

**Keep out of sunlight.**

Store empty or filled kegs preferably at  $0^{\circ}\text{C} < \text{Storage Temperature} < 35^{\circ}\text{C}$ .

Use a forklift with armoured cage for warehouse activities and pallet handling.

Keep away from stacked kegs, while risk of drop.

Stacking height			1 high	2 high		3 high		4 high		5 high	6 high
20L		H (mm)	590	1030	1180	1470	1770	1910	2360	2350	2790
	Empty	m (kg)	28,2	41,4	56,4	54,6	84,6	67,8	0	81	94,2
	Filled	m (kg)	248,2	481,4	496,4	714,6	744,6	947,8	992,8		
30L		H (mm)	730	1310	1460	1890	2190	2470			
	Empty	m (kg)	28,2	41,4	56,4	54,6	84,6	67,8			
	Filled	m (kg)	358,2	701,4	716,4	1044,6	1074,6				

## 4.5. Keg Filling

Contact our Dolium® One Way Keg Team for detailed filling line set-up specifications. For Tracking & Tracing purposes the Dolium® One Way kegs are individually identified by use of a digital 2D datamatrix (readable by camera) as well as an analogical yyyymmdd + hh:mm:ss inkjetprint on the keg bottom.

The new Dolium® One Way Kegs are flushed (> 90%) and **pre-pressurized with Co2.**

1,0 bar < CO2 pressure of Dolium® One Way Kegs < 1,2 bar bar

**Use professional equipment for filling the kegs:** The Dolium® One Way Kegs are equipped with standard fitting systems as per customer's request and are fully compatible with existing filling lines, conditional the necessary temperature and pressure settings have been respected, cleaning and steaming facilities are shut-off and the required and legal safety features are present.

The Dolium® One Way Kegs are supplied in dry and microbial clean conditions. Therefore it is important to treat the kegs accordingly as no cleaning or disinfection activity is required along the filling cycle.

Avoid microbial contamination as it can be cause of beer spoilage and, when fermenting the remaining extracts, premature burst in extreme conditions

Hot clean water rinse of the outer keg neck at max. 80°C for max. 2 seconds. ClO2 –chlorine dioxide or peracetic acid are allowed.

Remaining pressure test of the one-way kegs are to be checked at filling line entrance.

No cleaning or sterilizing cycle allowed:

**Keep Dolium® One Way Keg away from caustic hydroxides as cleaning agents**

**Keep Dolium® One Way Keg away from steam or vapour.**

CO2 flush mandatory prior to filling:

All Dolium® One Way Kegs have been vented by use of CO2 at assembly to evacuate most of the air and oxygen (O2) in particular.

Flush the kegs thoroughly with CO2 prior to filling.

For detailed Safety Instructions on CO2: see CO2 supplier instructions.

Dolium® One Way Keg Filling cycle :

Compatible to existing filling lines

Filling speed equal to stainless steel kegs

Filling by volumetric control

Checking by weight control

Avoid overfilling of the keg as it can result into burst at impact

Headspace = minimum 2%

## 4.6. Transport of Empty and Filled Kegs

Loading / Unloading of trucks, trains and containers: avoid open spaces between pallets, resp. kegs

Ambient conditions during transport :

No exposure to extreme temperatures; Recommended 0°C < Storage Temperature < 35°C

No exposure to direct sunlight

No exposure to wind

## 4.7. Handling, Dispensing and Storage of Full, Connected and Empty Kegs at Point of Sales

### 4.7.1. Handling - manual :

- Do not roll kegs over sharp objects
- Do not throw empty or filled kegs
- Recommended heights for dropping :
  - Drop on concrete : < 0.25 m
  - Drop on drop cushion : < 2,5 m

### 4.7.2. Storage before and after dispensing (not palletized)

- For safety and beer quality reasons, store filled kegs at  $1^{\circ}\text{C} < \text{Storage Temperature} < 35^{\circ}\text{C}$ .

- For beer quality reasons store beer kegs at a constant and colder temperature
- Do not stack (closed) filled kegs or (disconnected) empty kegs more than 2 kegs high

### 4.7.3. Dispensing :

- Use an appropriate keg connector, preferably with adjacent pressure relief valve.
- Use an appropriate and well functioning CO2 regulator and adjacent pressure relief valve.
- Use clean CO2 at purity rate > 99,8%.
- Do not stack a connected keg (in dispense mode)

### 4.7.4. CO2 pressurized Kegs

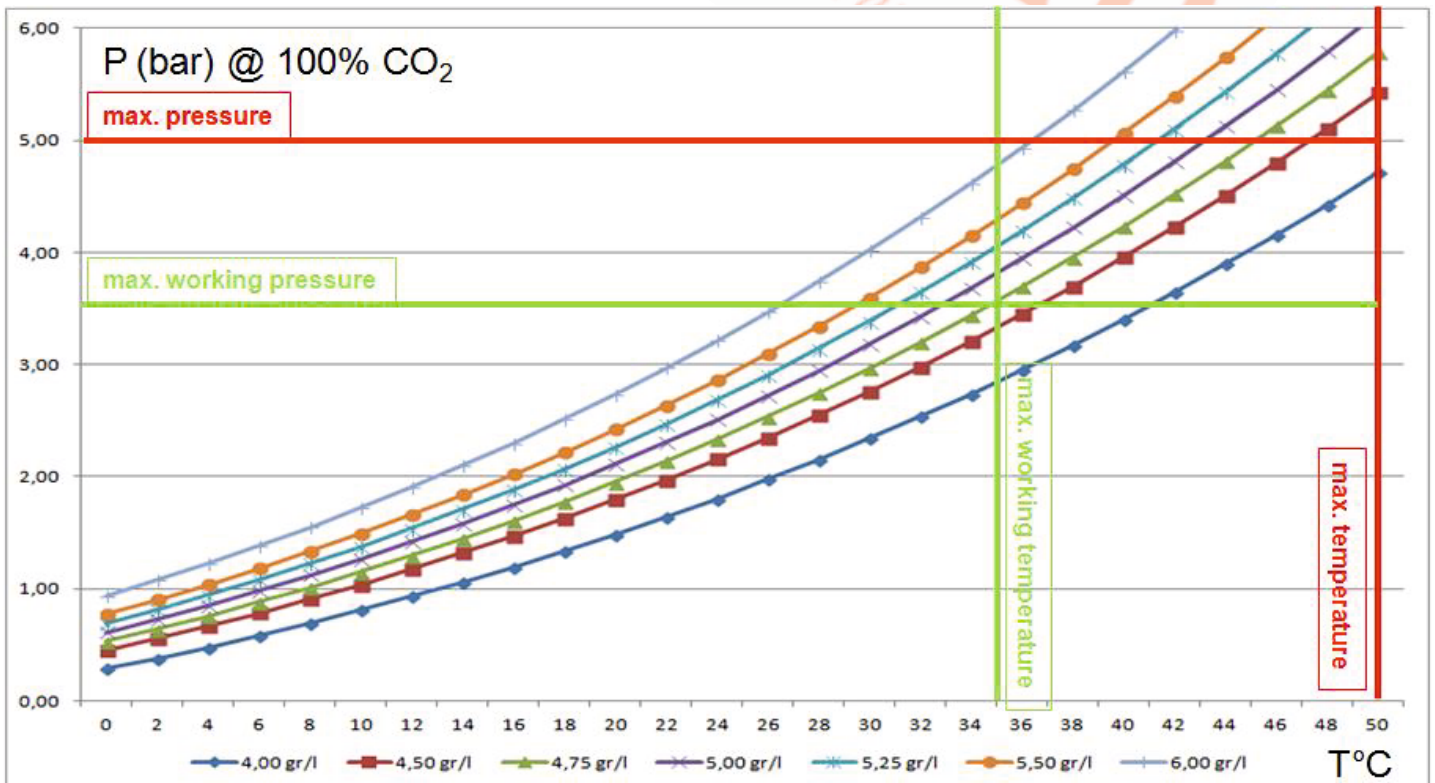
- Use CO2 always in well ventilated rooms.
- It is strongly recommended to install a CO2 alarm.
- For detailed safety instructions on CO2: see 4.3.
- Do not over-pressurize : Working Pressure = max. 3,5 bar
- Depressurize emptied kegs immediately after use, when emptied, by use of the PRV, outside or in a well ventilated area. For more details: see 4.3. Carbon-dioxide and 4.8. Disposal and Recycling

Pressure Table	Dolium <i>One-Way PET Kegs</i>
P work	3,5 bar (50 psi)
PRV	5,2 bar (72 psi)
P burst	> 7 bar (> 100 psi)



### STORAGE

$0^{\circ}\text{C} < T^{\circ} < 35^{\circ}\text{C}$   
(32°F) (95°F)



## 4.8. Disposal and Recycling

The Dolium® One Way Kegs are for professional purposes only and are not to be reused for any 2nd life purpose, not even when emptied and/or depressurize as this might lead to abuse or misuse creating high risk of accident such as burst or CO<sub>2</sub> release.

Do not clean, repair, maintain or reuse the Dolium® One Way Kegs.

Depressurize empty kegs – if not yet done – prior to disposal by crushing or shredding: after use, when emptied, kegs have still high residual pressure inside equal to the pressure at draught; it is strongly recommended to depressurize the kegs immediately by use of the PRV, outside or in a well ventilated area.

After One Way kegs have been emptied and depressurized, disposal of the kegs must be done in an environmental friendly way as prescribed.

The waste material still has commercial value. This value is at highest level in case the different materials are collected separately. After depressurization and upon availability, the use of an automated disposal machine for crushing and/or shredding is recommended.



**AFTER USE**  
**0 BAR (0 PSI)**



### Manual Depressurization and Disposal

	STEP	ACTION
	1	<b>ATTENTION!</b> Read the <b>Handling &amp; Safety Instructions</b> prior to any action or manipulation. For a safe handling and disposal, take care of the instructions below in the right chronological order.
	2	<ul style="list-style-type: none"> <li>- Keep away from children</li> <li>- Bring the empty kegs outside in open air or in a well ventilated area.</li> <li>- Keep the kegs away from direct sunlight.</li> <li>- Do not cut or pierce pressurized containers</li> <li>- CAUTION! CO<sub>2</sub> hazard! Stay out of the CO<sub>2</sub> blowing stream while venting</li> </ul>
	3	Depressurise empty kegs with a screw driver by turning the <b>Pressure Relief Valve 90°</b> or use the appropriate keg connector.
	4	Remove top + bottom from the body
	5	Unclips the spear from the keg neck by use of an appropriate tool
	6	Dispose by crushing or shredding the parts into separated bins or containers: <ul style="list-style-type: none"> <li>- Keg body: PET</li> <li>- Top + bottom rings: HDPE</li> <li>- Spear tube: LDPE</li> <li>- Spear: PET, TPE, stainless steel springs</li> </ul>