

# Handling & Safety instructions for DOLIUM® one-way kegs

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## 1. Objectives

This document describes how the DOLIUM<sup>®</sup> keg must be treated during handling, storage, filling, dispensing and disposal; to ensure the proper use of the DOLIUM<sup>®</sup> keg and to guarantee the **users safety** under all circumstances. Dispack-Projects NV (DOLIUM<sup>®</sup>) cannot be held responsible in case of non-compliance to the prescribed Handling & Safety instructions (see General Terms and Conditions). The Handling & Safety instructions contains amongst other topics; the description of safety procedures, actions, points of attention and equipment. These topics are necessary to protect people against accidents, injuries from misuse and the abuse of the polymer kegs, as well as the recycling of the DOLIUM<sup>®</sup> kegs.

## 2. Transmitting and sharing of instructions

The Handling & Safety instructions are part of the agreement governing the sale of the products by Dispack-Projects NV (the Seller) to the client (the Buyer). The Buyer expressly warrants that it will ensure proper transmission of such Handling & Safety instructions to the DOLIUM<sup>®</sup> 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<sup>®</sup> (Dispack-Projects NV) is available to the customers and clients for any information:

info@dolium.eu www.doliumkegs.com

\*Instructions can also be downloaded or viewed at <u>www.doliumkegs.com/DoliumDocumentation</u>



## 3. General instructions

#### 3.1. Must do's

- Use the kegs only for their proper purpose: the DOLIUM<sup>®</sup> keg is a recyclable pressurized PET keg for <u>single use</u> only (i.e., non-returnable) as an alternative to a stainless-steel keg for professional draught beverage applications.
- Use professional equipment for filling the kegs: the DOLIUM<sup>®</sup> kegs are equipped with standard fitting systems, fully compatible with existing filling lines and subject to adapted temperature and pressure settings.
- Use professional equipment for gas supply and gas pressure regulation: the use of a gas regulator is mandatory for maintaining working pressure at maximum 3,5 bar or 50 psi. For more details see: 5. and 10.3.
- Use professional equipment for connecting and dispensing the kegs: the DOLIUM<sup>®</sup> kegs are equipped with standard fitting systems and are fully compatible with existing standard draught installations, conditional the necessary temperature and pressure settings have been respected and the required and legal safety features are present on the equipment.
- Depressurize emptied kegs after use as soon as possible: after use, when emptied, kegs still have high residual pressure inside, equal to the pressure at draught; it is strongly recommended to depressurize the kegs immediately by using the integrated Pressure Relief Valve (PRV) in a well-ventilated area, preferably outside. For more details: see 5. and 9.
- Keep away from cleaning agents such as alkaline, caustic hydroxides or soapy cleaning products with a pH > 9, causing a chemical embrittlement, increasing the risk of a keg to burst.
- Keep away from direct sunlight or other heat sources as this can increase the 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.
- Keep away from children and consumers: the DOLIUM<sup>®</sup> kegs are for professional purposes only and cannot be considered as toys or any other 2<sup>nd</sup> life purpose, not even when emptied and/or depressurized.
- For more details on storage
  - Empty kegs: see 6.5.
  - Filled kegs: see 8.4.









#### 3.2. Do not's

- Do not over-pressurize kegs!
  Keep working and storage pressure at maximum of 3,5 bar 50 psi.
  Be aware of pressure increase due to refermentation.
  A too high pressure might result in a damaged keg.
- **Do not tamper with the spear** (keg valve system) or keg.
- Do not deliberately drop or impact the spear, neck or body of the keg.
- Do not clean, repair, maintain or reuse the DOLIUM<sup>®</sup> keg.
- Do not pierce the flexible body of the DOLIUM<sup>®</sup> in any way; as the pressurized keg body is composed of flexible PET material and a piercing will result into a burst and might cause an unsafe situation.
- Do not weaken or burn the keg, not even after use.
- Do not heat the kegs as this can increase the temperature as well as the pressure inside the keg. Do not expose to temperatures > 50°C
- Do not climb stacked kegs, neither use kegs for construction purposes.

## 4. Food safety

- The assembled keg is composed of materials which are compliant with the relevant European directives and US-FDA legislation for food contact materials. Food safety declarations of the sourcing companies and migration reports are available at Dispack-Projects NV.
- The production of the keg complies with the requirements of the GMP legislations.
- The keg is suitable for beverages with an alcohol content up to 15% (US) and 20% (EU) for long term storage at room temperature or below.

# 5. CO<sub>2</sub>/N - Safety Instructions

- Assure that all users are informed about CO<sub>2</sub> / N hazards and CO<sub>2</sub> / N user instructions. These are available at your CO<sub>2</sub> / N supplier. Read them carefully.
- CO2 is a non-toxic, odorless and colorless gas that is heavier than air. As such, CO2 replaces oxygen from the air, resulting in risk of suffocation at concentrations higher than 5%. CO2 concentrations as from 9% are lethal.
- N is a non- toxic, odorless and colorless gas. N replaces oxygen from the air, resulting in the risk of suffocation at concentrations higher then 82%.
  N concentrations as from 90% are lethal.
- Make sure the CO<sub>2</sub> / N is of food quality certified, with purity rate > 99,8 %.
- Make sure CO<sub>2</sub> / N bottles cannot drop. Fix them properly with a chain or similar.
- Use CO<sub>2</sub> / N bottles only with an appropriate CO<sub>2</sub> / N regulator and an adjacent pressure relief valve. NEVER connect a CO<sub>2</sub> / N bottle directly to a keg as instant high pressure could lead to immediate burst.
- It is strongly recommended to install a CO<sub>2</sub> / N alarm, especially in very small or not well-ventilated storage rooms or cellars.



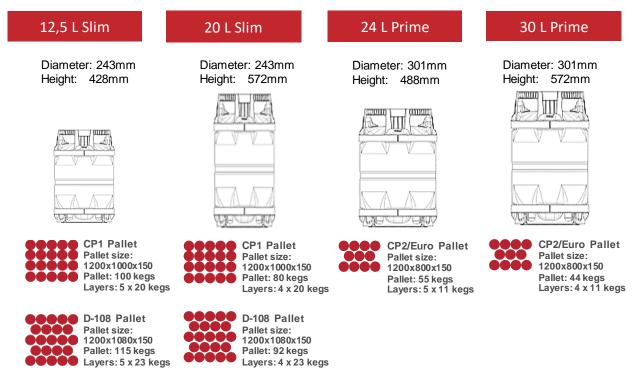


# 6. Palletizing, stacking, storage and transport of empty kegs

## 6.1. Palletization

- A good palletization is important to avoid the sliding, falling or destabilization of the kegs.
- The top surface of the pallet should not be slippery to prevent the kegs from sliding off the pallet. The bottom chimes of the DOLIUM<sup>®</sup> keg are provided with a knurling.
- Place the kegs on the pallets as per the palletization patterns from paragraph 6.2. The palletization depends on the keg types and pallet types.
- A good pattern prevent kegs from sliding.
- Ensure the stacking of the kegs is less than 50 mm over- or under hang at each side of the pallet.
- Fix the kegs on the pallet with strappings if the stacking is unstable.
- Maximum pallet load:
  - Static: < 4000 kg / 8 800 pound warehouse</p>
  - Dynamic: < 1400 kg / 3080 pound transport</li>

## 6.2. Palletisation patterns





## 6.3. Stacking of incoming empty kegs

1	.2,5 L Slim		
		5 h	igh
<b>CP1</b> 120x100 cm	Height (mm/inch)	2273	89
Kegs/layer: 20	Weight (kg/pound)	117	258
D-108 120x108 cm	Height (mm/inch)	2273	89
Kegs/layer: 23	Weight (kg/pound)	127	279

## 24 L Prime

		5 h	igh
<b>CP2</b> 120x80 cm	Height (mm/ <mark>inch</mark> )	2598	102
Kegs/layer: 11	Weight (kg/pound)	82	180
Euro 120x80 cm	Height (mm/ <mark>inch</mark> )	2598	102
Kegs/layer: 11	Weight (kg/pound)	92	202

2	0 L Slim		
		4 h	igh
<b>CP1</b> 120x100 cm	Height (mm/inch)	2446	96
Kegs/layer: 20	Weight (kg/pound)	98	215
<b>D-108</b> 120x108 cm	Height (mm/ <mark>inch</mark> )	2446	96
Kegs/layer: 23	Weight (kg/pound)	104	230
<b>Euro</b> 120x80 cm	Height (mm/ <mark>inch</mark> )	2446	96
Kegs/layer: 15	Weight (kg/pound)	83	183

# 30 L Prime

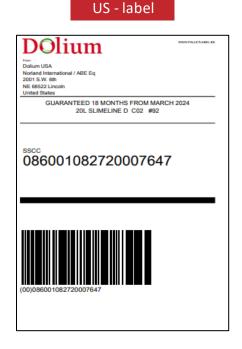
		<b>4 h</b> i	igh
CP2 120x80 cm	Height (mm/ <mark>inch</mark> )	2446	96
Kegs/layer: 11	Weight (kg/pound)	68	150
Euro 120x80 cm	Height (mm/inch)	2446	96
Kegs/layer: 11	Weight (kg/pound)	78	172



#### 6.4. Pallet Label

 Each pallet of the DOLIUM<sup>®</sup> kegs includes a unique SSCC code for identification and warehouse management purposes.





## 6.5. Storage and transport of empty kegs

- Storage of <u>empty</u> kegs:
  - **Keep out** of the wind by protective storage: light-weight kegs (even palletized) are not wind stable.
  - Keep out of sunlight.
- Store empty kegs preferably at 0° C < Storage temperature < 35° C.</li>
- Use a forklift with armored cage for warehouse activities and pallet handling.
- While loading /unloading of trucks, trains and containers: avoid open spaces between pallets.
- Ambient conditions during transport:
  - No exposure to extreme temperatures: keep kegs at 0° C < Storage temperature < 35° C
  - o No exposure to direct sunlight
  - No exposure to wind



## 7. Kegfilling

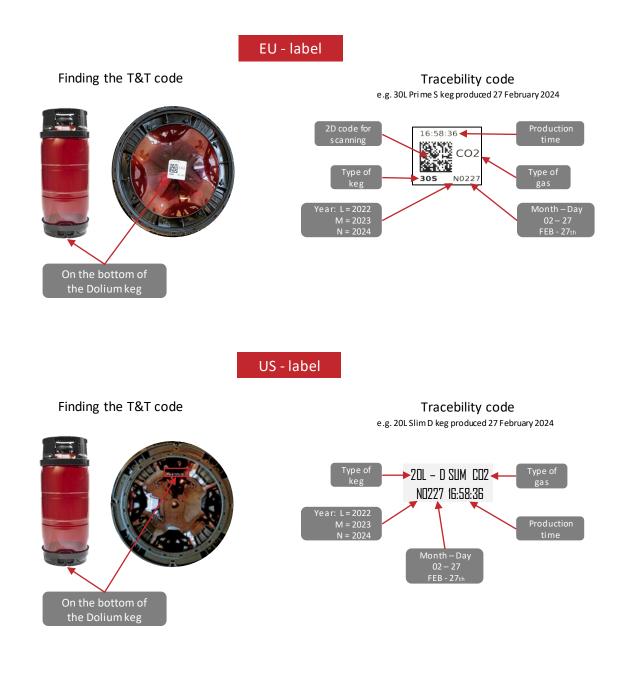
## 7.1. General

- The DOLIUM<sup>®</sup> kegs are fully compatible to all filling lines with equal filling speed as stainless-steel kegs.
- The DOLIUM<sup>®</sup> kegs are flushed and pre-pressurized with CO<sub>2</sub> and/or N@ 1,0 bar. Use professional equipment for filling the kegs: the DOLIUM<sup>®</sup> kegs are equipped with standard fitting systems 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<sup>®</sup> kegs are supplied in dry and microbial clean conditions. Therefore, no cleaning or disinfection activity is required along the filling cycle.
- Avoid microbial contamination as it can be the cause of beverage spoilage. Contamination might also lead to damaged kegs due to the fermentation of the remaining extracts.
- Disinfect the spear heads by spraying with alcohol or a peracetic acid solution for a few minutes prior to filling.
- Check that the DOLIUM<sup>®</sup> kegs are still pressurized before filling. Do not fill unpressurized kegs.
- No cleaning or sterilizing cycleallowed:
  - Keep DOLIUM<sup>®</sup> kegs away from caustic hydroxides as cleaning agents.
  - Keep DOLIUM<sup>®</sup> kegs away from steam or vapor.
- CO<sub>2</sub> or N flush mandatory prior to filling:
  - All DOLIUM<sup>®</sup> kegs have been flushed by use of CO<sub>2</sub> or N at assembly to evacuate most of the air and oxygen (O<sub>2</sub>) in particular.
  - $\circ~$  Flush the kegs thoroughly with CO\_2 or N prior to filling.
  - $\circ$  For detailed Safety Instructions on CO<sub>2</sub> or N : see CO<sub>2</sub> supplier instructions.
- DOLIUM<sup>®</sup> filling volume:
  - Filling by volumetric control
  - Checking by weight control
  - $\circ~$  Please respect the minimum headspace of 2 %
  - Avoid overfilling of the keg as it can result into a damage of the keg at impact
- Contact our DOLIUM<sup>®</sup> team at: <u>info@dolium.eu</u> for support and detailed filling guidelines.



#### 7.2. Keg label

For Tracking & Tracing purposes the DOLIUM<sup>®</sup> kegs are individually identified by use of a digital 2D data matrix (readable by camera) as well as an analogical *mmdd* + *hh:mm:ss* inkjet print on the keg bottom label.



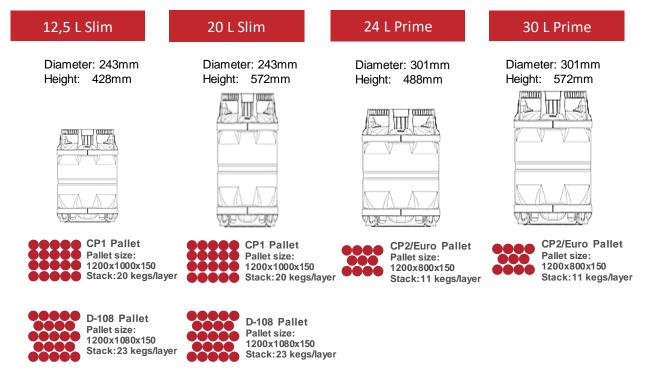


# 8. Palletizing, stacking, storage and transport of filled kegs

#### 8.1. Palletization

- A good palletization is important to avoid the sliding, falling or destabilization of the kegs.
- The top surface of the pallet should not be slippery to prevent the kegs from sliding off the pallet. The bottom chimes of the DOLIUM<sup>®</sup> keg are provided with a knurling.
- Place the kegs on the pallets as per the palletization patterns from paragraph 8.2. The palletization depends on the keg types and pallet types.
- A good pattern prevents kegs from sliding.
- Ensure the stacking of the kegs is less than 50 mm over- or under hang at each side of the pallet.
- Fix the kegs on the pallet with strappings if the stacking is unstable.
- Maximum pallet load:
  - Static: < 4000 kg / 8 800 pound warehouse</p>
  - Dynamic: < 1400 kg / 3 080 pound transport</p>

## 8.2. Palletisation patterns





	ng of fille	d kegs												
			Fil	lled	12,5	5 L SI	im							
							PALL						PA	
	004	11-1-1-4	1 Hig	<u></u> gh		2 H	ligh		3 H	igh		4 H	ligh	
	<b>CP1</b> 120x100 cm Kegs/layer: 20		581 291	23 641	1004 561	40 1237	1162 581	46 1282	1585 852	62 1878	2008 1123	79 2475	2324 1163	91 2563
Warehouse	D-108	(kg/pound) Height	581	23	1004	40	1162	46	1585	62	2008	79	2324	91
	120x108 cm Kegs/layer: 23	(mm/inch) Weight (kg/pound)		719	637	1405	652	1439	964	2125	1275		1305	2877
		Use "Plas on each l		ap"	1 H	igh		2 H	igh		3 H	igh	4 H	iigh
		on each l	ayer Heig	ght	_		1004			46	3 H 1585	ligh	4 H 2008	iigh 79
		on each l	Heig (mm/i Weig	ght inch) ght	1 H	igh		2 H	igh					79
Transport		on each l CP1 120x100 cm	ayer Heig (mm/i	ght inch) ght bund) ght	<b>1</b> H 581	igh 23	1004	<b>2</b> H 40	igh 1162	46	1585	62	2008	



## Filled 20 L Slim

												PALL	
		1 H	ligh		2 H	igh		3 H	igh		4 H	ligh	
CP1	Heigh (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
120x100 cm Kegs/layer: 20	Weight ( <sub>kg/pound)</sub>	441	973	863	1902	883	1946	1304	2875	1726	3804	1766	3892
D-108	Height (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
120x108 cm Kegs/layer: 23	Weight (kg/pound)	500	1101	984	2170	999	2203	1484	3271	1968	4340	1998	4406
EURO 120x80 cm	Height (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
Kegs/layer: 15	Weight (kg/pound)	341	752	657	1449	682	1504	1023	2256	1289	2842	1364	3008

Warehouse

	lse "Plastic-strap" n each layer				2 H	PAL PAL		3 High		
CP1	Heigh (mm/inch)	730	29	1302	51	1460	57	2032	80	
120x100 cm Kegs/layer: 20	Weight ( <sub>kg/pound)</sub>	441	973	863	1902	883	1946	1304	2875	
D-108	Height (mm/inch)	730	29	1302	51	1460	57	NI - 1 - 11		
120x108 cm Kegs/layer: 23	Weight (kg/pound)	500	1101	984	2170	999	2203	Not all	owed!	
EURO	Height (mm/inch)	730	29	1302	51	1460	57	2032	80	
120x80 cm Kegs/layer: 15	Weight (kg/pound)	341	752	657	1449	682	1504	1023	2256	

Transport

\_\_\_\_\_



			F	illed	24 L	Prin	ne							
									PAL		PA		PA	
							PALL							
	<b>CP2</b> 120x80 cm	Height (mm/inch)	<b>1 H</b> 646	1gn 25	1134	45	<b>igh</b> 1292	51	<b>3 H</b> 1780	70	2268	89	l <b>igh</b> 2584	102
	Kegs/layer: 11	Weight (kg/pound)	299	658	577	1273	597	1317	876	1931	1155	2545	1195	2633
Warehouse	<b>Euro</b> 120x80 cm	Height (mm/ <mark>inch</mark> )	646	25	1134	45	1292	51	1780	70	2268	89	2584	102
	Kegs/layer: 11	Weight (kg/pound)	304	669	582	1284	607	1339	886	1953	1165	2567	1215	2678



#### Transport



			Fi	illed	30 L	Prim	ne							
							<b>P</b> ALL							
			1 H	igh		2 H	igh		3 H	igh		4 H	ligh	
	CP2 120x80 cm	Height (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
	Kegs/layer: 11	Weight (kg/pound)	360	794	705	1554	720	1587	1065	2348	1410	3108	1440	3174
Warehouse	Euro 120x80 cm	Height (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
	Kegs/layer: 11	Weight (kg/pound)	370	816	715	1576	740	1631	1110	2447	1405	3097	1480	3262

Use "Plas on each la	-	1 H	igh		2 H	ligh		3 H	igh
CP2 120x80 cm	Height (mm/ <mark>inch</mark> )	730	29	1302	51	1460	57	2032	80
Kegs/layer: 11	Weight (kg/pound)	360	794	705	1554	720	1587	1065	2348
Euro 120x80 cm	Height (mm/inch)	730	29	1302	51	1460	57	2032	80
Kegs/layer: 11	Weight (kg/pound)	370	816	715	1576	740	1631	1110	2447

Transport

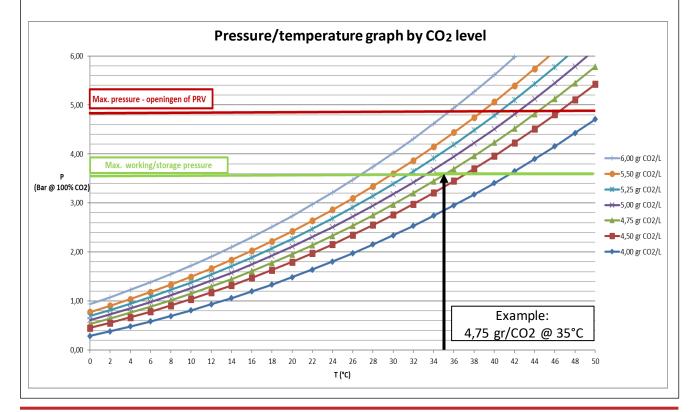
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## 8.4. Storage and transport of filled kegs

- Storage of <u>filled</u> kegs:
  - Keep out of sunlight.
- Internal pressure during storage must be lower than 3,5 bar.
- For storage temperature:
  - $\circ$   $\;$  The temperature is dictated by the internal pressure of 3,5 bar.
  - This pressure is dependent on the CO2-level and temperature as seen in the following graph. (Extended version on page 20.)
  - For example: Max. temperature (of beer saturated with 4,75 gr CO<sub>2</sub>) correspondents with 35°C.
  - In general, high storage temperatures impact the beer quality drastically in a negative way and should be avoided.
- Use a forklift with armored cage for warehouse activities and pallet handling.
- While loading /unloading of trucks, trains and containers: avoid open spaces between pallets.
- Ambient conditions during transport:
  - No exposure to extreme temperatures
  - No exposure to direct sunlight
  - No exposure to wind

Pressure table										
Working/storage pressure	< 3,5 bar / 50 PSI									
PRV	4,8 bar / 70 PSI									
Burst pressure	>7,2 bar / 101 PSI									





## 9. Automatic Pressure Relief Valve (PRV)

- The DOLIUM<sup>®</sup> PRV is an innovative and patented feature. The automatic "Pressure Relief Valve" (PRV) has a dual purpose. Firstly, it allows the pressure to be released automatically when it exceeds 4,8 bar (+/- 0,3) during storage or transport, which then automatically closes when it reaches 2 bar.
- After use, the pressure of the keg can be released by turning the DOLIUM<sup>®</sup> PRV with a screwdriver a quarter turn.







## 10. Keg handling, dispensing and storage at point of sales

#### 10.1. Handling – manual

- Do not roll kegs over sharp objects
- Do not throw empty or filled kegs
- Avoid dropping filled kegs:
  - Drop on concrete: < 0,25 m
  - Drop on drop cushion: < 2,5m

#### **10.2.** Storage before and after dispensing (not palletized)

- Internal pressure during storage must be lower than 3,5 bar.
- For storage temperature:
  - The temperature is dictated by the internal pressure of 3,5 bar.
  - This pressure is dependent on the CO<sub>2</sub>-level and temperature as seen in the graph on page 20.
  - $\circ~$  For example: Max. temperature (of beer saturated with 4,75 gr CO<sub>2</sub>) correspondents with 35°C.
  - For beverage quality reasons, store filled kegs at a constant temperature.
- Do not stack unpalletized (closed) filled kegs or (disconnected) emptied kegs more than 2 kegs high.

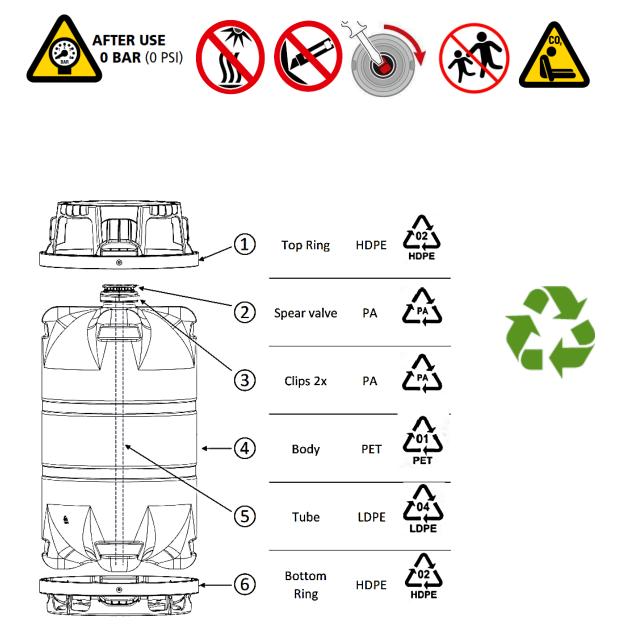
#### 10.3. Dispensing

- Use an appropriate keg connector.
- Use an appropriate CO<sub>2</sub> or N regulator and adjacent pressure relief valve. The pressure relieve valve should be able to release 6 kg CO<sub>2</sub> / h minimum at 4 Bar.
- Use food grade CO<sub>2</sub> or N at purity rate > 99,8%.
- Use CO<sub>2</sub> always in well ventilated rooms.
- Do not over-pressurize, working pressure = max. 3,5 bar (see table page 15).
- Do not stack a connected keg when in dispense mode.
- Depressurize emptied kegs immediately after use when emptied, by use of the PRV, outside or on a well-ventilated area.
  - See 5.
  - $\circ~$  See 9.
  - $\circ~$  See 11.



# 11. Disposal and recycling

- The DOLIUM<sup>®</sup> kegs are for professional purposes only and are not to be re-used for any 2nd life purpose, not even when emptied and/or depressurized. Do not clean, repair, maintain or re-use the DOLIUM<sup>®</sup> kegs.
- Kegs with unconsumable beer should be emptied and depressurized.
- Depressurize emptied kegs to 0 bar with the PRV outside or in a well-ventilated area (see 9. and 5.).
- After the DOLIUM<sup>®</sup> kegs have been emptied and depressurized, disposal of the kegs must be done in an environmentally friendly way. Please contact your local recycler.





## 12. Complaint Handling

- In the event of an issue or complaint, please send an e-mail to: <u>info@dolium.eu</u> and include the following information :
  - o Customer name
  - o Issue description
  - Keg label picture (see section 7.2)
  - $\circ$   $\;$  Pictures of kegs involved in the complaint
  - # kegs involved
- If possible, please quarantine the kegs for examination.
- Our DOLIUM<sup>®</sup> team will activate the complaint process and contact you.

info@dolium.eu www.dolium.eu www.doliumkegs.com

