Handling & Safety instructions for DOLIUM® one-way kegs

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1. Objectives

This document describes how the DOLIUM® keg must be treated during handling, storage, filling, dispensing and disposal; to ensure the proper use of the DOLIUM® keg and to guarantee the **users safety** under all circumstances. Dispack-Projects NV (DOLIUM®) 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® 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® 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® (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 www.doliumkegs.com /DoliumDocumentation*

3. General instructions

3.1. Must do's

- **Use the kegs only for their proper purpose***:* the DOLIUM® keg is a recyclable pressurized PET keg for single use 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® 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® 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 > 8, 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® 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.
- **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® keg**.**
- **Do not pierce the flexible body** of the DOLIUM® 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_2/N - Safety Instructions

- Assure that all users are informed about CO_2 / N hazards and CO_2 / N user instructions. These are available at your CO_2 / N supplier. Read them carefully.
- CO_2 is a non-toxic, odorless and colorless gas that is heavier than air. As such, CO_2 replaces oxygen from the air, resulting in risk of suffocation at concentrations higher than 5%. CO_2 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_2 / N is of food quality certified, with purity rate > 99,8 %.
- Make sure CO_2 / N bottles cannot drop. Fix them properly with a chain or similar.
- Use CO_2 / N bottles only with an appropriate CO_2 / N regulator and an adjacent pressure relief valve. **NEVER** connect a CO_2 / N bottle directly to a keg as instant high pressure could lead to immediate burst.
- It is strongly recommended to install a CO_2 / N alarm, especially in very small or not well-ventilated storage rooms or cellars.

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

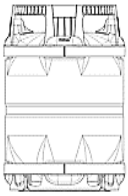
6.1. Palletization

- 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® 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
  - Dynamic: < 1400 kg / 3080 pound – transport

6.2. Palletisation patterns

12,5 L Slim

Diameter: 243mm
Height: 428mm

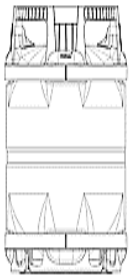


CP1 Pallet
Pallet size:
1200x1000x150
Pallet: 100 kegs
Layers: 5 x 20 kegs

D-108 Pallet
Pallet size:
1200x1080x150
Pallet: 115 kegs
Layers: 5 x 23 kegs

20 L Slim

Diameter: 243mm
Height: 572mm

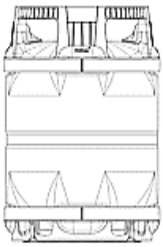


CP1 Pallet
Pallet size:
1200x1000x150
Pallet: 80 kegs
Layers: 4 x 20 kegs

D-108 Pallet
Pallet size:
1200x1080x150
Pallet: 92 kegs
Layers: 4 x 23 kegs

24 L Prime

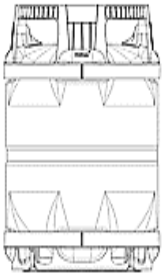
Diameter: 301mm
Height: 488mm



CP2/Euro Pallet
Pallet size:
1200x800x150
Pallet: 55 kegs
Layers: 5 x 11 kegs

30 L Prime

Diameter: 301mm
Height: 572mm



CP2/Euro Pallet
Pallet size:
1200x800x150
Pallet: 44 kegs
Layers: 4 x 11 kegs

6.3. *Stacking of incoming empty kegs*

12,5 L Slim

		5 high	
CP1 120x100 cm Kegs/layer: 20	**Height** (mm/inch)	2273	89
	Weight (kg/pound)	117	258
D-108 120x108 cm Kegs/layer: 23	**Height** (mm/inch)	2273	89
	Weight (kg/pound)	127	279

20 L Slim

		4 high	
CP1 120x100 cm Kegs/layer: 20	**Height** (mm/inch)	2446	96
	Weight (kg/pound)	98	215
D-108 120x108 cm Kegs/layer: 23	**Height** (mm/inch)	2446	96
	Weight (kg/pound)	104	230
Euro 120x80 cm Kegs/layer: 15	**Height** (mm/inch)	2446	96
	Weight (kg/pound)	83	183

24 L Prime

		5 high	
CP2 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	2598	102
	Weight (kg/pound)	82	180
Euro 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	2598	102
	Weight (kg/pound)	92	202

30 L Prime

		4 high	
CP2 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	2446	96
	Weight (kg/pound)	68	150
Euro 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	2446	96
	Weight (kg/pound)	78	172

6.4. *Pallet Label*

- Each pallet of the DOLIUM® kegs includes a unique SSCC code for identification and warehouse management purposes.

EU - label

US - label

6.5. *Storage and transport of empty kegs*

- Storage of empty 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.**
- 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
  - No exposure to direct sunlight
  - No exposure to wind

7. Keg filling

7.1. General

- The DOLIUM® kegs are fully compatible to all filling lines with equal filling speed as stainless-steel kegs.
- The DOLIUM® kegs are flushed and **pre-pressurized with CO_2 and/or N** @ 1,0 bar. ***Use professional equipment for filling the kegs***: the DOLIUM® 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® 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.
- Please wear protective equipment/gear when filling as precautionary measure.
- Check that the DOLIUM® kegs are still pressurized before filling. Do not fill unpressurized kegs.
- No cleaning or sterilizing cycle allowed:
  - **Keep** DOLIUM® kegs **away from caustic hydroxides** as cleaning agents.
  - **Keep** DOLIUM® kegs **away from steam or vapor**.
- CO_2 or N flush mandatory prior to filling:
  - All DOLIUM® kegs have been flushed by use of CO_2 or N at assembly to evacuate most of the air and oxygen (O_2) in particular.
  - Flush the kegs thoroughly with CO_2 or N prior to filling.
  - For detailed Safety Instructions on CO_2 or N : see CO_2 supplier instructions.
- DOLIUM® filling volume:
  - Filling by volumetric control
  - Checking by weight control
  - 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® team at: info@dolium.eu for support and detailed filling guidelines.

7.2. *Keg label*

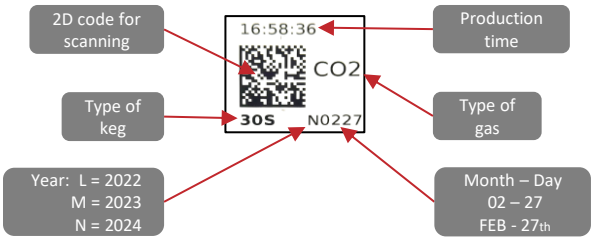
- For Tracking & Tracing purposes the DOLIUM® kegs are individually identified by use of a digital 2D data matrix (readable by camera) as well as an analogical *mmdd + hh:mm:ss* inkjet print on the keg bottom label.

EU - label

Finding the T&T code

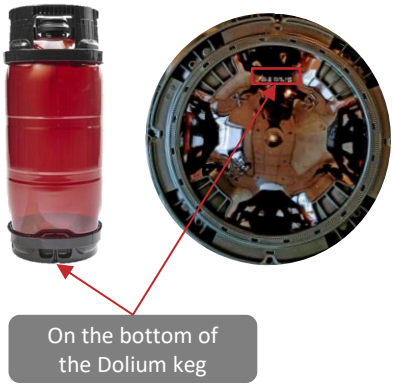
Tracebility code

e.g. 30L Prime S keg produced 27 February 2024



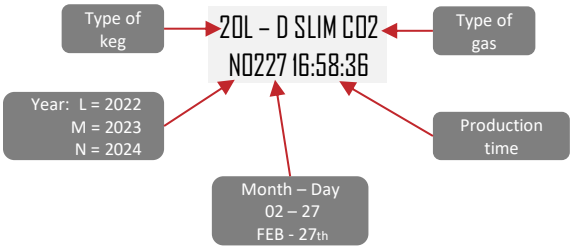
US - label

Finding the T&T code



Tracebility code

e.g. 20L Slim D keg produced 27 February 2024



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

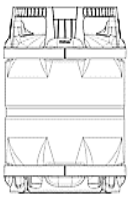
8.1. Palletization

- 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® 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
  - Dynamic: < 1400 kg / 3 080 pound – transport

8.2. Palletisation patterns

12,5 L Slim

Diameter: 243mm
Height: 428mm

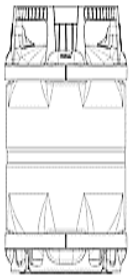


CP1 Pallet
Pallet size:
1200x1000x150
Stack: 20 kegs/layer

D-108 Pallet
Pallet size:
1200x1080x150
Stack: 23 kegs/layer

20 L Slim

Diameter: 243mm
Height: 572mm

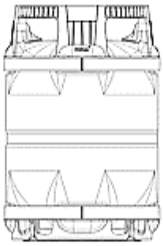


CP1 Pallet
Pallet size:
1200x1000x150
Stack: 20 kegs/layer

D-108 Pallet
Pallet size:
1200x1080x150
Stack: 23 kegs/layer

24 L Prime

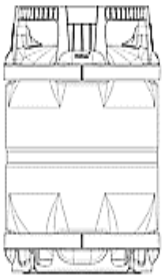
Diameter: 301mm
Height: 488mm



CP2/Euro Pallet
Pallet size:
1200x800x150
Stack: 11 kegs/layer

30 L Prime

Diameter: 301mm
Height: 572mm



CP2/Euro Pallet
Pallet size:
1200x800x150
Stack: 11 kegs/layer

8.3. *Stacking of filled kegs*

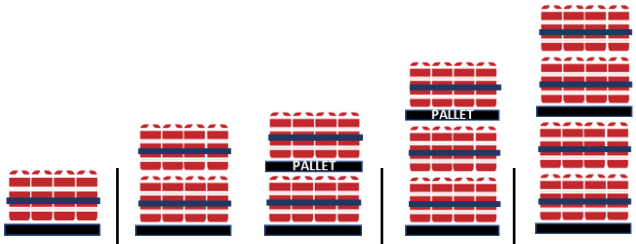
Filled 12,5 L Slim

Warehouse

		1 High		2 High				3 High		4 High			
CP1 120x100 cm Kegs/layer: 20	**Height** (mm/inch)	581	23	1004	40	1162	46	1585	62	2008	79	2324	91
	Weight (kg/pound)	291	641	561	1237	581	1282	852	1878	1123	2475	1163	2563
D-108 120x108 cm Kegs/layer: 23	**Height** (mm/inch)	581	23	1004	40	1162	46	1585	62	2008	79	2324	91
	Weight (kg/pound)	326	719	637	1405	652	1439	964	2125	1275	2811	1305	2877

Transport

Use "Plastic-strap" on each layer



		1 High		2 High				3 High		4 High	
CP1 120x100 cm Kegs/layer: 20	**Height** (mm/inch)	581	23	1004	40	1162	46	1585	62	2008	79
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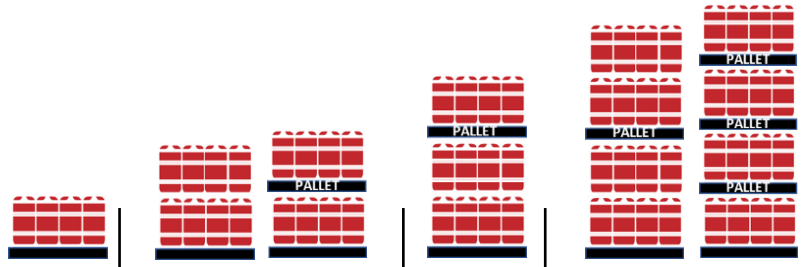
D-108 120x108 cm Kegs/layer: 23	**Height** (mm/inch)	581	23	1004	40	1162	46	1585	62	2008	79
	Weight (kg/pound)	326	719	637	1405	652	1439	964	2125	1275	2811

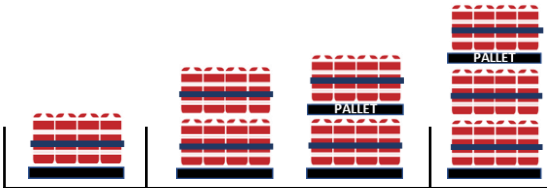
Filled 20 L Slim



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

Warehouse

Use “Plastic-strap” on each layer

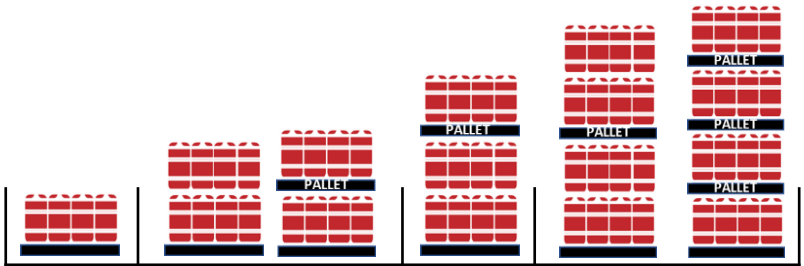


		1 High		2 High				3 High	
CP1 120x100 cm Kegs/layer: 20	**Heigh** (mm/inch)	730	29	1302	51	1460	57	2032	80
	Weight (kg/pound)	441	973	863	1902	883	1946	1304	2875
D-108 120x108 cm Kegs/layer: 23	**Height** (mm/inch)	730	29	1302	51	1460	57	**Not allowed!**	
	Weight (kg/pound)	500	1101	984	2170	999	2203		
EURO 120x80 cm Kegs/layer: 15	**Height** (mm/inch)	730	29	1302	51	1460	57	2032	80
	Weight (kg/pound)	341	752	657	1449	682	1504	1023	2256

Transport

Filled 24 L Prime

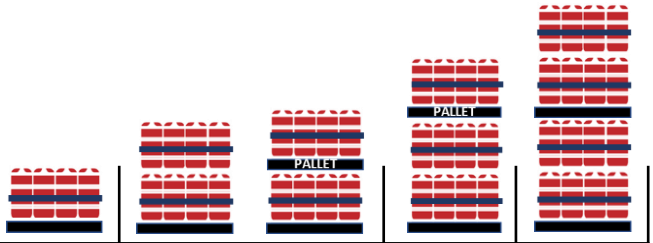
Warehouse



		1 High		2 High				3 High		4 High			
CP2 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	646	25	1134	45	1292	51	1780	70	2268	89	2584	102
	Weight (kg/pound)	299	658	577	1273	597	1317	876	1931	1155	2545	1195	2633
Euro 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	646	25	1134	45	1292	51	1780	70	2268	89	2584	102
	Weight (kg/pound)	304	669	582	1284	607	1339	886	1953	1165	2567	1215	2678

Transport

Use "Plastic-strap" on each layer



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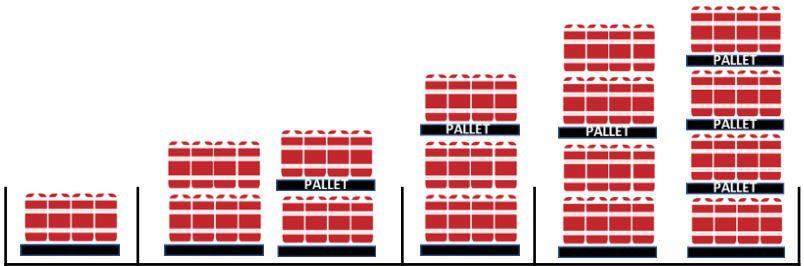
	Weight (kg/pound)	304	669	582	1284	607	1339	886	1953	1165	2567

Filled 30 L Prime

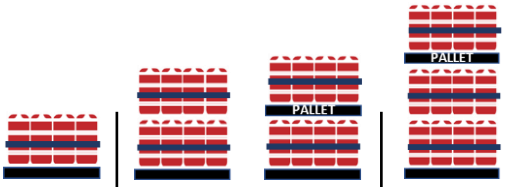


Warehouse

		1 High		2 High				3 High		4 High			
CP2 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
	Weight (kg/pound)	360	794	705	1554	720	1587	1065	2348	1410	3108	1440	3174
Euro 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	730	29	1302	51	1460	57	2032	80	2604	103	2920	115
	Weight (kg/pound)	370	816	715	1576	740	1631	1110	2447	1405	3097	1480	3262

Transport

Use “Plastic-strap” on each layer

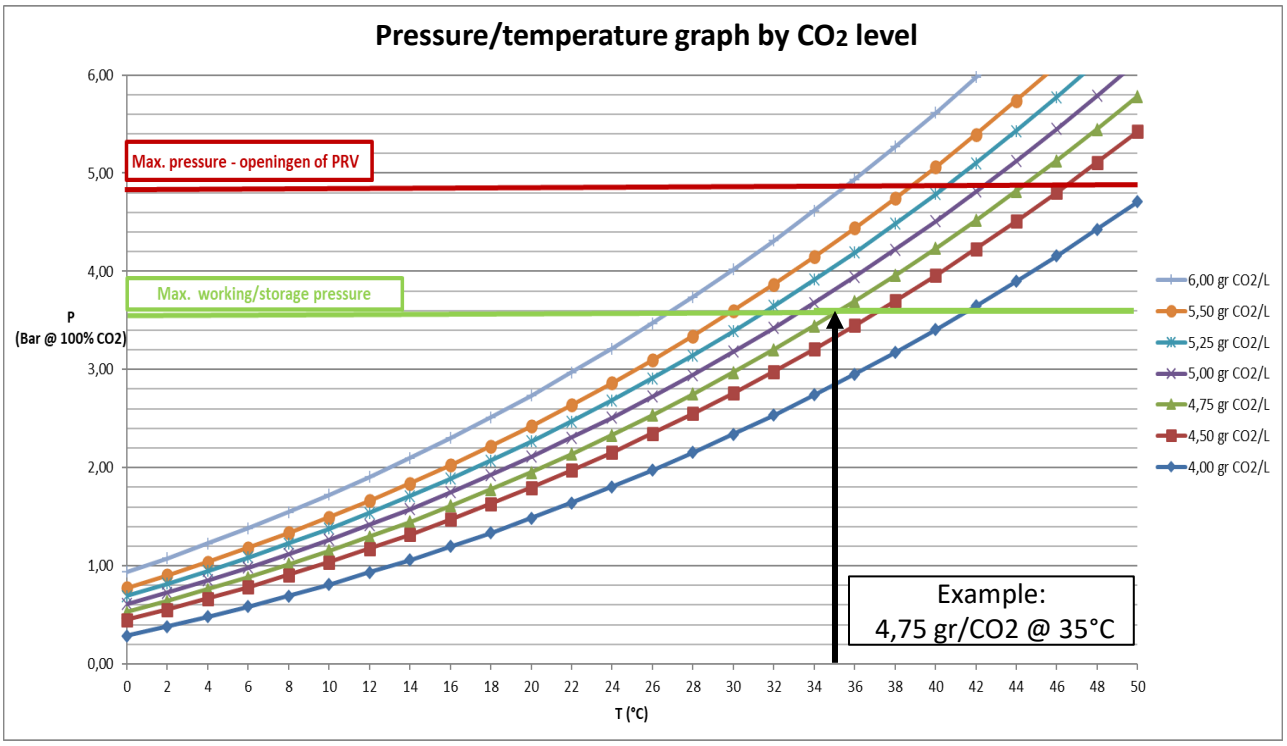


		1 High		2 High				3 High	
CP2 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	730	29	1302	51	1460	57	2032	80
	Weight (kg/pound)	360	794	705	1554	720	1587	1065	2348
Euro 120x80 cm Kegs/layer: 11	**Height** (mm/inch)	730	29	1302	51	1460	57	2032	80
	Weight (kg/pound)	370	816	715	1576	740	1631	1110	2447

8.4. *Storage and transport of filled kegs*

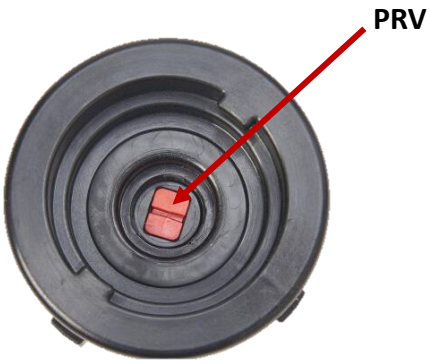
- Storage of filled kegs:
  - **Keep out** of sunlight.
- Internal pressure during storage must be lower than 3,5 bar.
- For storage temperature:
  - The temperature is dictated by the internal pressure of 3,5 bar.
  - This pressure is dependent on the CO2-level and temperature as seen in the following graph. (Extended version on page 20.)
  - For example: Max. temperature (of beer saturated with 4,75 gr CO_2) 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® 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® 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)

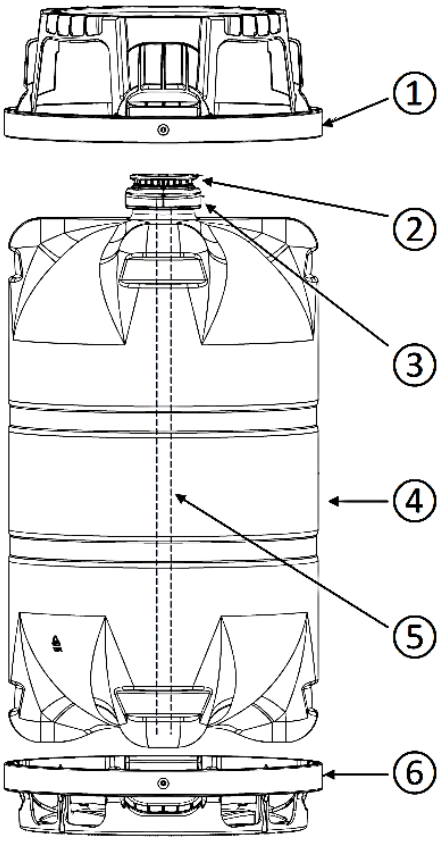
- Internal pressure during storage must be lower than 3,5 bar.
- For storage temperature:
  - The temperature is dictated by the internal pressure of 3,5 bar.
  - This pressure is dependent on the CO_2-level and temperature as seen in the graph on page 20.
  - For example: Max. temperature (of beer saturated with 4,75 gr CO_2) 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_2 or N regulator and adjacent pressure relief valve. The pressure relieve valve should be able to release 6 kg CO_2 / h minimum at 4 Bar.
- Use food grade CO_2 or N at purity rate > 99,8%.
- Use CO_2 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.
  - See 9.
  - See 11.

11. Disposal and recycling

- The DOLIUM® 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® 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® kegs have been emptied and depressurized, disposal of the kegs must be done in an environmentally friendly way. Please contact your local recycler.

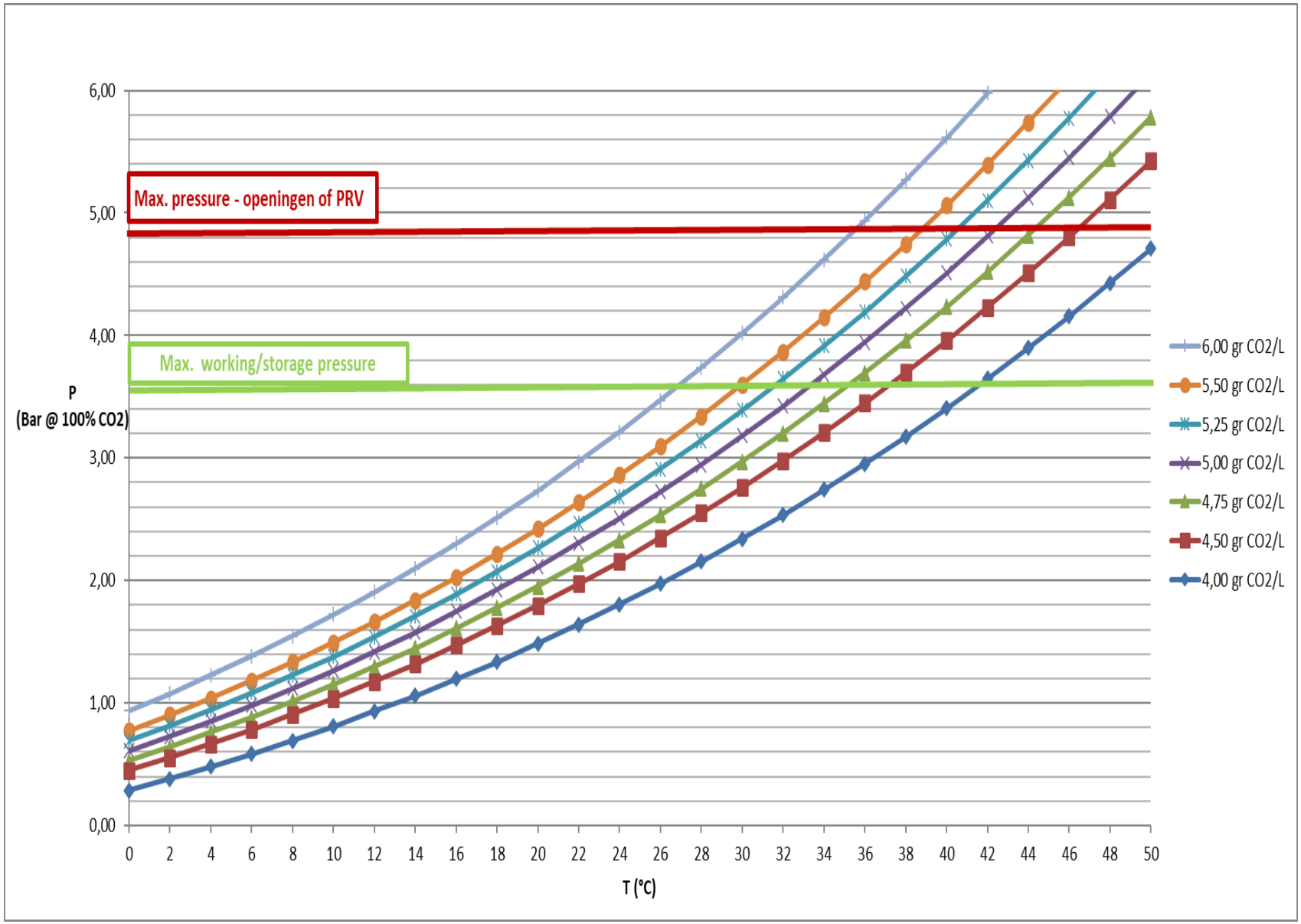


1	Top Ring	HDPE	02 HDPE
2	Spear valve	PA	PA
3	Clips 2x	PA	PA
4	Body	PET	01 PET
5	Tube	LDPE	04 LDPE
6	Bottom Ring	HDPE	02 HDPE

12. Complaint Handling

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

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

Dolium
MOST ADVANCED ONE-WAY KEG

Pressure/temperature graph by CO_2 level