



PERFORMANCE GUIDELINES FOR REFILLABLE KEGS - INTRODUCTION

Best Practices for Procurement, Performance, and Use of Refillable Beer Kegs

The Performance Guidelines for Refillable Kegs (Guidelines) is an industry recommendation to ensure beer keg quality and address best practices in the procurement, performance, and usage of beer kegs. This guideline applies to all refillable beer kegs, irrespective of their material composition (whether steel, plastic or combination), new, used or reconditioned.

In its entirety, the Guidelines will facilitate the safe operation of kegs and their components throughout the brewing industry network. The document addresses industry concerns regarding purchasing and procurement, performance, regulatory and safety considerations, keg washing, keg filling, keg and plant quality control procedures, storage, handling, transportation, dispensing, repair and reconditioning, and decommissioning. Additionally, the document's appendix includes an extensive glossary, test methodologies, keg washing and filling system detailed descriptions, and more.

The Guidelines summarize industry accepted and recommended best practice guidance and is not intended to be used as a strict specification or standard. It is the brewer's responsibility to address their own specific needs and to refine these guidelines as appropriate in a written practice for themselves and for their suppliers. It is also the brewer's responsibility to familiarize themselves with all federal, state, and local statutes and regulations and to maintain compliance to all.

PERFORMANCE GUIDELINES FOR REFILLABLE KEGS – SUMMARY OF KEY FINDINGS

Performance on Failure, Section 5.1.1. In the case of failure, it is critical that kegs should fail safe in all events. Fail safe criteria means no fragments and no ejection of components, venting of liquid or gas contents only, with no propulsion of the keg or valve. Fail safe applies at all times when the keg is in service or being serviced, whether full, partially empty or empty.

Rigors of the Trade, Keg Life Cycle, Section 5.4.5.1. Keg manufacturers, when designing and constructing kegs, and brewers, when considering kegs for purchase, should anticipate that the keg will be able to withstand the rigors of the trade during the course of its life cycle (10 to 30 years, 60 to 180 cycles.) For refillable kegs the rigors of trade include a continuous repeated cycle of keg filling, shock and vibration of transport, manual and mechanical handling including drops and impacts during moves and storage, pressurization and dispense, empty storage under variable temperature conditions, additional handling, return transport, emptying, and complete re-wash with various chemicals, temperatures and pressures.

Maximum Allowable Working Pressure 60 psig, Section 5.4.10.5. Maximum Allowable Working Pressure, (MAWP), is the maximum pressure at which a keg should be allowed to operate. The standard U.S. industry practice for MAWP is 60 psig. U.S. refillable kegs are commonly marked with a warning that the container will rupture if pressurized above 60 psig.

Minimum Design Pressure, 300 psig, Safety Margin, Sections 5.4.10.6, 5.4.10.7. Design Pressure is the maximum pressure a keg is designed to withstand before rupture. Based on industry experience to satisfy the rigors of the trade, a minimum design pressure of 300 psig is

recommended for refillable kegs. Safety Margin is the amount by which the Design Pressure exceeds the MAWP. Safety margin is expressed as a multiplier. A Minimum Design Pressure of 300 psig provides a safety margin of at least 5 times the MAWP. The predominance of refillable kegs exceeds this safety margin. A safety margin of 10 times is not uncommon.

Pressure Relief Devices, Section 5.4.10.8. It is recommended that a pressure relief device, such as a burst disc, be included in the keg design. The relief device should activate above the Maximum Allowable Working Pressure and below the Design Pressure.

Purchasing and Procurement, Section 4. Brewers, keg manufacturers and cleaning and filling equipment suppliers should coordinate with each other to provide the brewer with kegs that are suitable for the anticipated rigors of the trade and are compatible with the brewers cleaning and filling equipment. Keg and component manufacturers should produce to and comply with specifications and technical drawing dimensional targets and tolerances, capacities, materials of construction, processes and procedures as agreed upon with the brewer.

Fitness and Function Testing, Section 5.4. Kegs should be tested in a manner that reconstructs the typical stress challenge conditions (i.e., rigors of the trade) a keg should experience in its life cycle. The objective of the recommended testing is to reconstruct the environmental conditions that a keg will experience in its lifecycle. Understanding how the keg performs under the anticipated conditions will identify risks that a brewer should consider when selecting a keg system.

Keg Safety, Section 6.2. It is critical that keg and equipment manufacturers, brewers, wholesalers, retailers and consumers regard safe operations of kegs as their prime concern. All keg components and equipment that interact with keg assemblies (such as kegs, spears, valves, taps, carbon dioxide tanks, nitrogen tanks, washing and filling equipment) should be equipped with safety devices. All systems to which a keg can be connected that use pressurized air, carbon dioxide, water, steam, etc. should have a pressure regulator and pressure relief valve. Altering, circumventing or destroying safety features of any keg components are not recommended.

Spear Safety, Sections 5.2.9.1.4, 6.2. Keg valves should incorporate a device to prevent a spear from ejecting from a keg under pressure. Removal of or tampering with a keg valve for any purpose should be conducted by a trained professional using tools designed specifically for this purpose. Altering, circumventing or destroying safety features of any keg components is not recommended.

Keg Washing, Keg Filling, Sections 7.1, 8.1. There is no defined “typical washing / filling” procedure for all applications. Keg compatibility should be verified in partnership with the keg manufacturer, the brewer and the keg washing / filling system vendor to provide the optimum washing /filling sequence, and to maintain keg quality and performance. In the event that brewers’ floats contain kegs from different manufacturers or constructed from dissimilar materials, wash /fill cycles may need to be adjusted accordingly. Failure to do so may cause damage to the keg, damage to the equipment or injury.

STAKEHOLDERS RESPONSIBILITIES

In order for the Performance Guidelines for Refillable Kegs (Guidelines) to be an effective resource in developing best practices for the procurement, performance and safe use of refillable beer kegs, all industry stakeholder must assume specific responsibilities. It is imperative that the brewer, keg and component manufacturers, and keg washing equipment suppliers establish understanding on a number of specific issues.

Brewer Responsibility

The brewer must clearly understand anticipated rigors of trade and the distribution and dispensing environment to which the keg will be subjected, as well as specific cleaning and filling requirements. Brand specifications, such as CO2 volumes and pH of the finished beer, must be understood and reconciled with keg materials and performance specifications. The brewer must ensure that his or her existing and potential future kegs, valves and cleaning/filling lines are all compatible by fostering dialogue between current and prospective suppliers. This understanding must be clearly communicated to the supplier in the form of specific criteria. All aspects for both current usage and future requirements of keg systems should be considered.

Supplier Responsibility

Suppliers must provide technical drawings that verify that their kegs meet the brewers' criteria. The actual kegs sold to the brewer must fulfill the data provided in the drawings, both in detailed specs and suitability of use. Keg vendors and washing / filling equipment providers must coordinate compatibility of their products to ensure kegs are fit for purpose as defined by the brewer, and compatible with existing kegs, valves and equipment as appropriate.

Warranty

Suppliers must provide clear and understandable warranty terms and conditions. Brewers must understand the terms and conditions of the warranty and operate the kegs within the conditions specified by the supplier in order for the warranty to remain valid.