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PRODUCT BULLETIN

UPB 68 03-01-97

Live-Loaded Valve Stem Packings

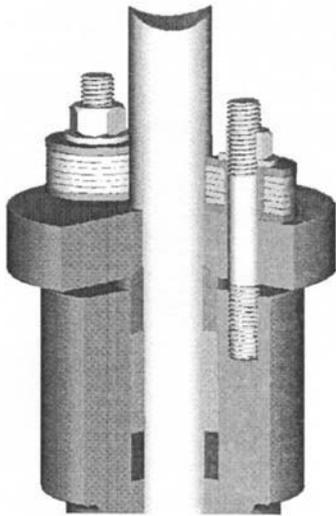


Figure 1.
Typical Live-Loaded Valve Assembly

UTEX has disc spring assemblies for live loading valve stem packing, especially for valves in critical service such as high temperatures or exotic fluid sealing. The purpose of disc springs is to maintain compressive forces on valve stem packing through thermal and pressure cycles. Without live loading, torque on a valve's gland studs will decrease over time due to uneven expansion in the valve during thermal and pressure shocks causing the valve stem packing to leak.

Disc springs, which are also known as Belleville springs, are like washers with a slight conical shape. The assemblies are designed to fit over the gland studs on valves and are compressed by the gland stud nuts. Once the spring assemblies are in place, the packing should not need any other adjustments to reduce leakage. However, due to packing consolidation and other factors, the spring stacks will grow causing them to exert reduced forces on

the packing. Therefore, the spring stacks will eventually need to be re-tightened to their original height. The amount of time between adjustments will depend on the specific service in which they are used.

The service and the valve with which the spring assemblies will be used should be recorded on a Live-Loaded Valve Packing Assembly Information Sheet, UTEX drawing A-9914-C, so that a proper assembly can be designed. A spring assembly design will include the design of any spring guides (see below) recommended with the springs as well as the size, number and arrangement of the disc springs themselves.

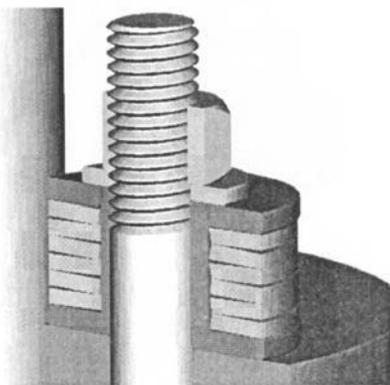


Figure 2.
Typical Disc Spring Assembly

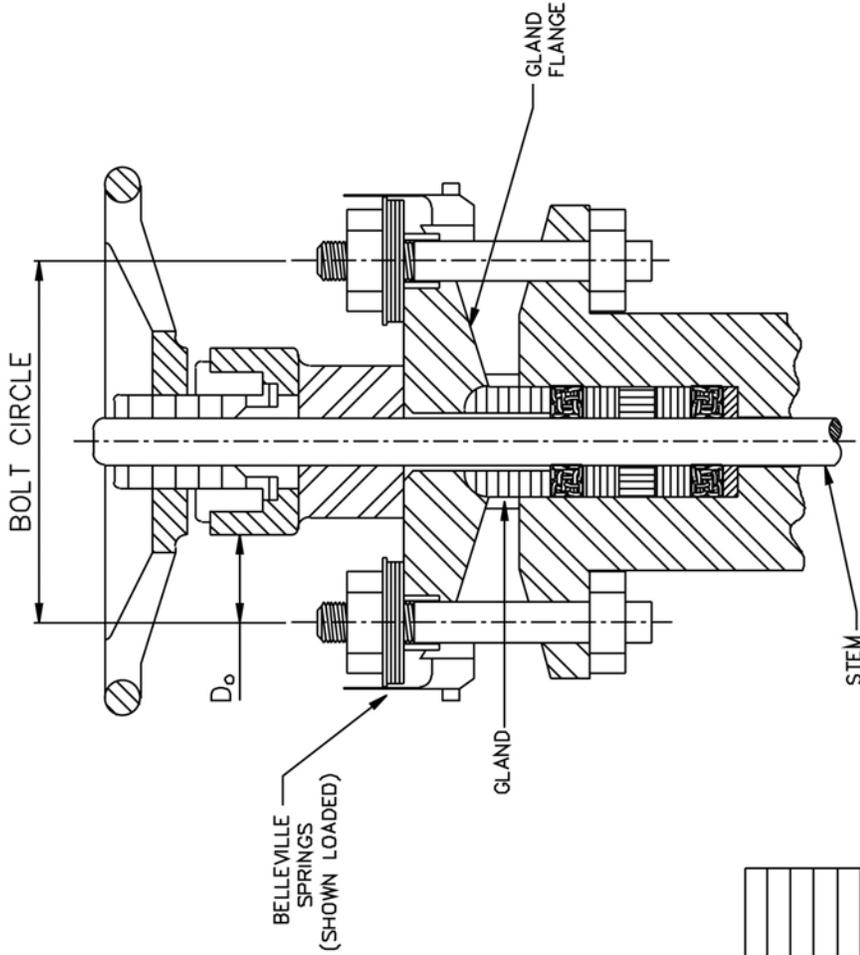
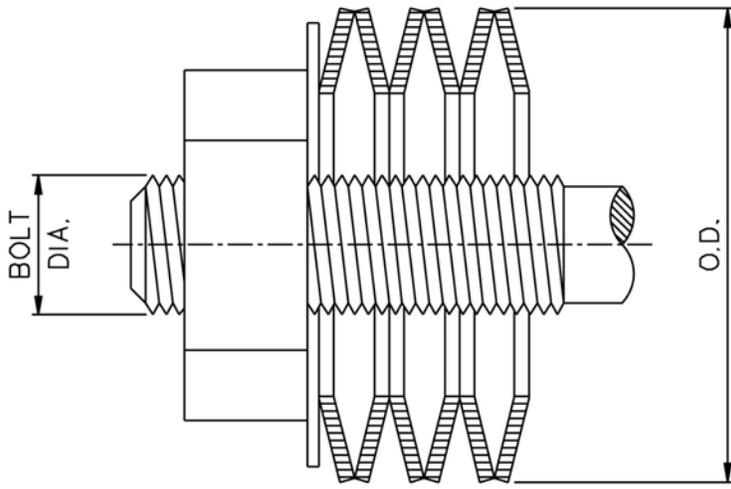
The forces generated by the spring assemblies are determined by their compression; therefore, the working height of each assembly is very important. Spring guides are often supplied with the spring assemblies to help achieve proper compression in the springs. UTEX recommends using spring guides whenever possible. Inner spring guides, as shown in Figure 2, also help protect the gland stud from damage while installing the spring assemblies. Torque values may also be used to judge when the spring assemblies have been properly compressed.

Live loading is generally applied only to valves with braided or die-formed stem packing. The following is a short list of UTEX packing recommended for use with live-loading:

Table 1: Packings Recommended for Live Loading		
Packing Style	Service Conditions	
	Maximum Pressure	Maximum Temperature
1303-0226 combination	4000 psi (275 bar)	850°F(454°C), 1200°F (648°C) in steam
0686-0226 combination	4000 psi (275 bar)	850°F(454°C), 1200°F (648°C) in steam
0684	4000 psi (275 bar)	650°F (343°C)
0689	5000 psi (344 bar)	850°F(454°C), 1200°F (648°C) in steam
0232-0212 combination	5500 psi (379 bar)	500°F (260°C)
0217	4000 psi (275 bar)	500°F (260°C)

UTEX recommends using five braided rings or three die-formed rings with two braided end rings as packing in valves utilizing live-loading spring assemblies. To minimize spring relaxation, UTEX recommends using 17/7 PH stainless steel for all live-loading applications up to spring operating temperatures of 400°F. Typically, the spring operating temperature will be significantly lower than the system temperature, sometimes by as much as one third. 17/7 PH stainless steel is also good for operations in hazardous or corrosive environments. Other materials, such as Inconel, are also available for disc springs operating at elevated temperatures or upon customer request. UTEX will also supply a split carbon bushing as a spacer below the packing if a spacer is required in the packing assembly.

REV. DESCRIPTION	DATE:	BY:	APPVD. BY:	SYST. CHG.	ECN #
VALVE SPECIFICATIONS					
PACKING SIZE (DxOD):		DIST. TO OBSTRUCTION(D _o):			
TOTAL STUFFING BOX DEPTH:		PRESSURE (psi):			
LANTERN RING HEIGHT:		TEMPERATURE (F):			
BOLT DIAMETER:		PRODUCT HANDLED:			
BOLT CIRCLE (B.C.):		NO. OF PACKINGS REQ'D:			
NUMBER OF BOLTS:		TYPE OF VALVE: /MFR:			



COMPANY NAME: _____

ADDRESS: _____

PHONE: _____

PERSON TO CONTACT: _____

UTEX SALES PERSON: _____

NOTES: _____

CUSTOMER INFORMATION:



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DATE: 26 FEB 97
 BY: RE
 CHK'D BY:
 APPVD. BY
 SYST. CHK.:
 PDN: N/A

TITLE: LIVE-LOADED VALVE PACKING ASSEMBLY INFORMATION SHEET
 CUSTOMER:
 DWG.#: A-9914-C
 REV.: N/A