



# Valve and Flange Live Loading Worksheet

A practical data sheet for live loading disc spring stacks used to reduce bolt load loss, packing relaxation, gasket relaxation and leakage risk.

Draft review version | English source copy

Use this form to prepare a cleaner RFQ package before engineering review.

## 1. Application Type

■	Valve packing live loading	Valve type, stem size, packing type, operating temperature
■	Flange bolting live loading	Flange rating, gasket type, bolt size, process media
■	Pressure vessel / heat exchanger joint	Thermal cycling, gasket relaxation, shutdown cost
■	Other bolted joint	Describe the joint and failure symptom

## 2. Joint and Bolt Data

Bolt size / grade	Diameter, thread, material grade, quantity of bolts
Available washer space	Maximum OD, bolt hole/ID, available height under nut or gland
Target preload	Target bolt load, torque, gasket seating stress or packing load
Movement to absorb	Expected gasket relaxation, packing relaxation, thermal expansion, embedment or settlement

## 3. Leakage and Service Risk

Process media		Media controls material route and leakage consequence.
Pressure / temperature		Thermal cycling and pressure cycling drive preload loss.
Retightening access		Hard-to-access joints benefit more from elastic load reserve.

<b>Leakage history</b>		Past symptoms help separate gasket, bolt, packing and spring issues.

### 4. Suggested Review Path

- Confirm the actual failure mode: leakage, retightening frequency, packing relaxation, gasket relaxation or thermal movement.
- Define the target load window before selecting washer geometry.
- Check available space under the nut, gland follower or flange hardware.
- Review material for temperature, corrosion and stress relaxation risk.
- Review stack arrangement, support faces, friction and guidance before production approval.

### 5. Live Loading RFQ Attachments

<b>Joint drawing</b>	■ Yes / no	Confirms bolt circle, space, washer seat and assembly limits.
<b>Bolt and gasket data</b>	■ Yes / no	Allows preload and relaxation discussion to start from real inputs.
<b>Photos of installed joint</b>	■ Yes / no	Shows access, corrosion, washer orientation and practical constraints.
<b>Operating history</b>	■ Yes / no	Useful when solving repeated leakage or shutdown problems.

### 6. Buyer Notes

<b>Main leakage or preload problem</b>	<b>Shutdown or maintenance impact</b>
<b>Preferred material or standard</b>	<b>Required reports or certificates</b>
<b>Target delivery date</b>	<b>Sample / trial / production quantity</b>

**Engineering review note:** Live loading is a load-retention system, not a generic washer replacement. Fatigue life, K4 geometry source, friction and support face conditions must be reviewed by qualified engineers, together with bolt stress, gasket or packing behavior and temperature effects, before final use.