Trombik Engineers Ltd.

Trombik Engineers Ltd. is an independent engineering office, located in Zurich, Switzerland, proudly representing over 40 years of successful firm history. The record of achievement includes nearly all fields in civil and structural engineering. Thanks to the emphasis on structural dynamics, especially machine foundations, promoted since the formation of the company in the year 1959, Trombik Engineers Ltd. reached international recognition.

In keeping with world’s recent industrial developments, Trombik Engineers Ltd. is able to offer the full range of services with regards to static and dynamic analysis, layout and design of concrete, steel and associated structures. In addition, we offer specialised services in the field of noise and vibration control, structural acoustics and structural physics. Since 1998, all our services and processes are in accordance with the requirements of international standard ISO 9001 (Quality Control System).

Civil Engineering
Civil engineering regarding domestic buildings, commercial properties and industrial constructions. Consulting, planning, design, project and execution drawings as well as construction supervisions for new constructions, extensions and renovations.

Structural Dynamics
Dynamic design for civil engineering works regarding natural, human, wind or machine induced vibrations. Case studies, numerical analysis and sourcing for all kind of structural dynamic problems and vibration phenomena, including earthquakes, impacts, blasts and fatigue effects.

Sound, Vibrations and Structure-Borne Sound
Recording, measuring and studies of sound, vibration and structure-borne sound at their source and their transfer. Analysis, assessment, prognoses, preventive measures.

Structural Acoustics, Structural Physics
Planning and projecting of sound and vibration measures. Calculations, analysis, prognoses, case studies, verifications according to current codes. Steady state and transient thermal transfer and vapour diffusion calculations. Thermal and humidity protection, overall energy considerations regarding thermal insulation.

Measurements
Vibrations, sound and structural-borne sound measurements using firm-owned instruments of highest measurement precision class. Structural dynamics measurement campaigns: vibration and natural frequency recordings. Airborne sound and subsonic noise isolation measurements according current codes.

Machine Foundations, Elastic Supports
Consulting, design and construction supervision for all sorts of elastic support applications as well as for all conventional and spring supported machine foundations; starting from small applications (i.e. PC) to large-scale machines (i.e. turbo generators).

Spring Elements
Complete range of high accuracy spring supports for high and highest loads is available. These height adjustable TROMBIK Spring elements have been enhanced and optimised based on long experience and can be applied to all load areas and purposes.

TROMBIK Spring Elements
High Accuracy Spring Supports
Spring Elements for High and Highest Loads
Elastic Supports for Machines, Buildings and Railroads

1) Integral
2) Core
3) Vacuum
4) 4B
5) Primo
TROMBIK Spring Elements for High and Highest Loads

TROMBIK Spring Elements are applied as vibration isolation devices/suspension for machines, equipment, buildings, and railroads by a system of springs. Two different categories have to be separated: source isolation of machines and installations (e.g., elastic support of turbines, condensers, feed pumps, sludge hammer, and presses) and receiver isolation for delicate machines and installations, against all kinds of vibrations including earthquakes.

High Accuracy Spring Elements

Trombik Engineers Ltd. produces a complete range of spring-supported supports for high and highest loads. These height-adjustable TROMBIK Spring-elements have been enhanced and optimised based on long-lasting experience and can be applied to all load areas and purposes. For the main part, built up of disc springs, as well as for the casing parts, materials of the highest quality class are used. Special designs for clients and/or for objects, e.g., helical spring layouts or adapted load areas are possible as well.

System SPRINGLIFT

The system SPRINGLIFT is an effective, modern and versatile applicable area-supporting-system, mainly for machine types of middle weights and railroads/trams. It is based on multiple spring elements cast into secondary slabs. By this, large areas can be decoupled (typical application: high sensitive installations or workshop having several/changeable machines). The advantages are: easy to build, ideal vibration isolation, accessibility/adjustability of the spring elements [control/replacement], long-term resistance.

Spring Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Loading Range</th>
<th>Spring Stiffness (*)</th>
<th>(*), tuning depending on application</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTEGRAL</td>
<td>750 - 4000</td>
<td>30 - 350</td>
<td></td>
</tr>
<tr>
<td>CORE</td>
<td>750 - 4000</td>
<td>30 - 350</td>
<td></td>
</tr>
<tr>
<td>PRIMO</td>
<td>750 - 1000</td>
<td>30 - 200</td>
<td></td>
</tr>
<tr>
<td>VACUUM(*)</td>
<td>750 - 1000</td>
<td>30 - 200</td>
<td></td>
</tr>
<tr>
<td>4B</td>
<td>250 - 500</td>
<td>5 - 60</td>
<td></td>
</tr>
</tbody>
</table>

Further technical details available on demand.

Revision and Maintenance Work

TROMBIK Spring Elements are high quality products and are insensitive against external influences. They are often used in accordance with long-term operation machine units, so periodical revision and maintenance work on the SPRING Elements have to be carried out. By checking and overhauling the functionality, the vibration-isolation between the machine foundation and the substructure can be granted. At the same time the spring load distribution will be equalised and if necessary deformations of the foundation table can be readjusted.

High Accuracy Spring Elements

Trombik Engineers Ltd. produces a complete range of high accuracy spring supports for high and highest loads. These height-adjustable TROMBIK Spring-elements have been enhanced and optimised based on long-lasting experience and can be applied to all load areas and purposes. For the main part, built up of disc springs, as well as for the casing parts, materials of the highest quality class are used. Special designs for clients and/or for objects, e.g., helical spring layouts or adapted load areas are possible as well.

System SPRINGLIFT

The system SPRINGLIFT is an effective, modern and versatile applicable area-supporting-system, mainly for machine types of middle weights and railroads/trams. It is based on multiple spring elements cast into secondary slabs. By this, large areas can be decoupled (typical application: high sensitive installations or workshop having several/changeable machines). The advantages are: easy to build, ideal vibration isolation, accessibility/adjustability of the spring elements [control/replacement], long-term resistance.

Spring Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Loading Range</th>
<th>Spring Stiffness (**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTEGRAL</td>
<td>750 - 4000</td>
<td>30 - 350</td>
</tr>
<tr>
<td>CORE</td>
<td>750 - 4000</td>
<td>30 - 350</td>
</tr>
<tr>
<td>PRIMO</td>
<td>750 - 1000</td>
<td>30 - 200</td>
</tr>
<tr>
<td>VACUUM(*)</td>
<td>750 - 1000</td>
<td>30 - 200</td>
</tr>
<tr>
<td>4B</td>
<td>250 - 500</td>
<td>5 - 60</td>
</tr>
</tbody>
</table>

Further technical details available on demand.

Revision and Maintenance Work

TROMBIK Spring Elements are high quality products and are insensitive against external influences. They are often used in accordance with long-term operation machine units, so periodical revision and maintenance work on the SPRING Elements have to be carried out. By checking and overhauling the functionality, the vibration-isolation between the machine foundation and the substructure can be granted. At the same time the spring load distribution will be equalised and if necessary deformations of the foundation table can be readjusted.

High Accuracy Spring Elements

Trombik Engineers Ltd. produces a complete range of high accuracy spring supports for high and highest loads. These height-adjustable TROMBIK Spring-elements have been enhanced and optimised based on long-lasting experience and can be applied to all load areas and purposes. For the main part, built up of disc springs, as well as for the casing parts, materials of the highest quality class are used. Special designs for clients and/or for objects, e.g., helical spring layouts or adapted load areas are possible as well.

System SPRINGLIFT

The system SPRINGLIFT is an effective, modern and versatile applicable area-supporting-system, mainly for machine types of middle weights and railroads/trams. It is based on multiple spring elements cast into secondary slabs. By this, large areas can be decoupled (typical application: high sensitive installations or workshop having several/changeable machines). The advantages are: easy to build, ideal vibration isolation, accessibility/adjustability of the spring elements [control/replacement], long-term resistance.

Spring Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Loading Range</th>
<th>Spring Stiffness (**)</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTEGRAL</td>
<td>750 - 4000</td>
<td>30 - 350</td>
</tr>
<tr>
<td>CORE</td>
<td>750 - 4000</td>
<td>30 - 350</td>
</tr>
<tr>
<td>PRIMO</td>
<td>750 - 1000</td>
<td>30 - 200</td>
</tr>
<tr>
<td>VACUUM(*)</td>
<td>750 - 1000</td>
<td>30 - 200</td>
</tr>
<tr>
<td>4B</td>
<td>250 - 500</td>
<td>5 - 60</td>
</tr>
</tbody>
</table>

Further technical details available on demand.

Revision and Maintenance Work

TROMBIK Spring Elements are high quality products and are insensitive against external influences. They are often used in accordance with long-term operation machine units, so periodical revision and maintenance work on the SPRING Elements have to be carried out. By checking and overhauling the functionality, the vibration-isolation between the machine foundation and the substructure can be granted. At the same time the spring load distribution will be equalised and if necessary deformations of the foundation table can be readjusted.