

technogrid®

CONVEYOR COUNTER WEIGHT ARRESTING SYSTEM



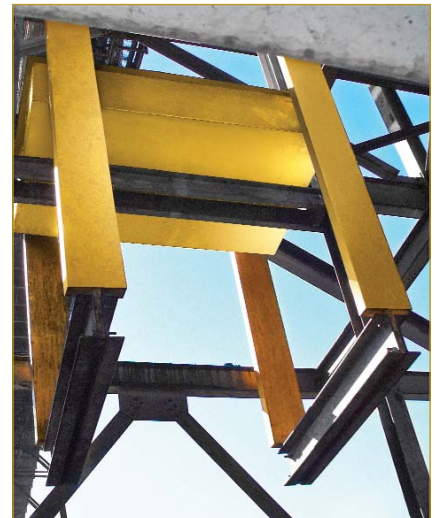
One of the newest applications of the **Technogrids®** is the arresting of the conveyor counter weights. In some applications, if the belt snaps

and the counter weight falls to the ground, there is no damage done and it is not an issue. In other cases however, if the counter weight falls and does serious damage to structures or equipment below, then counter weight arresting needs to be considered.

cation range from 12kJ to 225kJ (see date sheet for options) and can be used in any combination of series or parallel up to 5 000kJ.



Full view of counter weight installation.



Close-up of yellow **Technogrids®** and catch frame from underneath the installation.



Closer view of the yellow **Technogrids®** with the counter weight hanging in between them.

The **Technogrid®** provides the ideal solution to this problem. The specified **Technogrids®** are simply 'hung up' vertically next to or below the counter weights with a catch frame attached to the bottom of the **Techno-grids®**. The catch frame is situated just below the lowest point of the normal vertical movement allowed for the counter weight. The top of the **Technogrids®** are anchored to the structure. The structure must be verified to ensure that it can handle the impact forces which are generated by the impact (see data sheet for end forces). Upon impact, the **Technogrids®** will stop the counter weight and absorb all the energy and the counter weight will remain on the catch frame until reinstalled on the repaired conveyor belt.



Close-up of the **Technogrid®** installation from the top. Note the guide channel on the right hand side for the counter weight.

After a full impact, the **Technogrids®** simply need to be replaced and then the **Technogrid®** arresting system is ready for the next impact. The **Technogrids®** available for this appli-

FOR MORE PICTURES OF THIS INSTALLATION PLEASE GO TO THE WEBSITE.

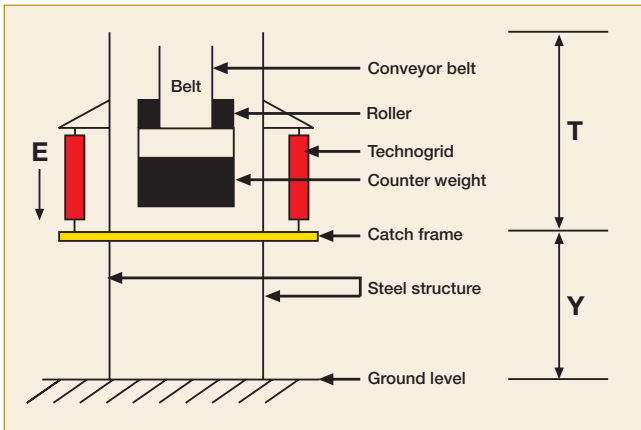
FOR INSTALLATION DETAILS AND DIMENSIONS OF THE TECHNOGRIDS®, PLEASE REFER TO THE DATA SHEET ON THE WEBSITE.

technogrid®

SPECIFYING THE TECHNOGRID® COUNTER WEIGHT ARRESTING SYSTEM

Symbols

- T Maximum distance that counter weight can fall if the counter weight is at its highest position
- Y Maximum stroke area permitted for impact energy to be absorbed, the **Technogrid®** stroke must be less than Y
- R Maximum end force that will be transmitted into the **Technogrid®** connection point (top)



General Notes

- The crash beam should be installed just below the point of normal travel of the counter weight so as not to interfere with the normal movement of the counter weight. This also reduces the impact energy that needs to be absorbed.
- The **Technogrids®** can be installed in any configuration from 2 or 4 grids in parallel or strings of **Technogrids®** mounted in series in 2 or 4 strings.

Formulas used in the calculation process

- $E = m.g.h$
- E = energy
- m = mass of counter weight
- s = stroke of **Technogrid®**
- h = maximum fall distance of counter weight
($h = T + s$, s is the stroke of selected unit)
- n = Number of **Technogrids®** used in parallel

Worked example of specifying your **Technogrid®**

Parameters of example

- m 4 tons
- T 2m
- Y 5m

HORNE OFFERS A FREE DESIGN SERVICE FOR SPECIFYING THE COUNTER WEIGHT TECHNOGRIDS®. THIS BROCHURE IS INTENDED AS A GUIDELINE AND THE BROCHURE IS USED AT YOUR OWN RISK. IT IS ADVISABLE TO CONTACT HORNE FOR THE VERIFICATION OF DESIGN CALCULATIONS.

If you have received this brochure and not the accompanying data sheet, the data sheet can be downloaded from the website. The data sheet on the website will always have the latest information with additional graphs added which are not on the data sheet.

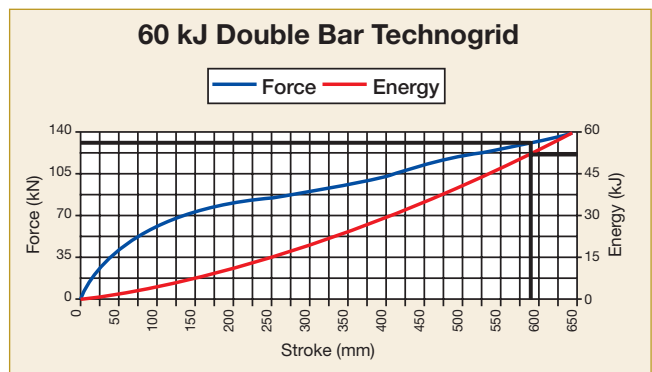
Calculations

Assume a stroke of a **Technogrid®**, we chose a 60kJ **Technogrid®** which has a stroke of 650mm.

Use the data sheet to choose the **Technogrid®** with its maximum stroke.

$$\begin{aligned}
 E &= mgh \\
 &= 4 \times 9.81 \times (2+0.65) \\
 &= 103.9\text{kJ}
 \end{aligned}
 \qquad
 \begin{aligned}
 E \text{ per unit} &= \frac{E \text{ total}}{n} \\
 &= \frac{103.9\text{kJ}}{2} \\
 &= 51.95\text{kJ}
 \end{aligned}$$

Two 60kJ **Technogrids®** will absorb the 103.9kJ of total energy with each **Technogrid®** absorbing 51.95kJ.



How to read the graph

1. Take the energy value and read off from the right hand side of the graph inwards until the energy curve is intersected.
2. Extend the intersection point vertically in both directions until the force curve above is intersected and the stroke distance of the **Technogrid®** is intersected on the bottom.
3. Where the vertical line intersects the force curve, move horizontally to the left and read off the end force of the **Technogrid®**.

In this example 51.95kJ intersects the energy curve at a stroke of approx 590mm and the end force per **Technogrid®** is approximately 131kN.