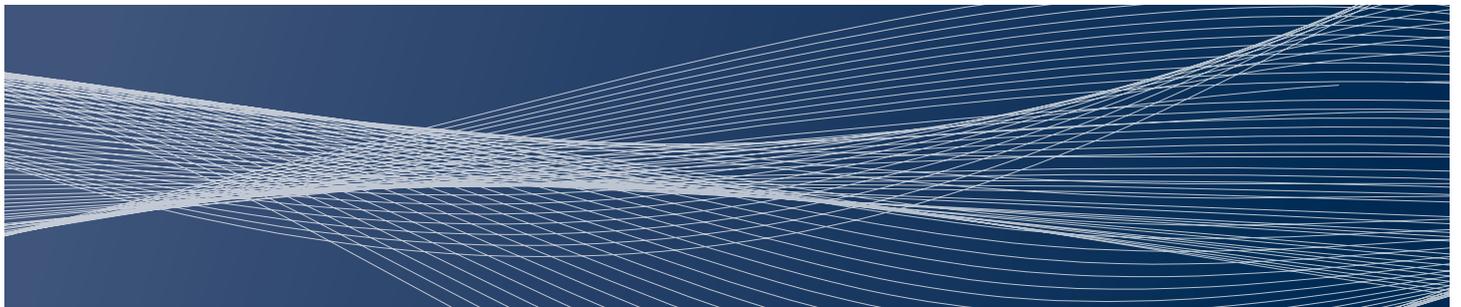


# CIVICELL RAIL PAD AND CIPLACELL BASE PLATE PAD

Rail pads and base plate pads for high elastic rail fastening systems



# BEARING DESIGN



**Modern track bed structures** require elastic components to minimise the forces produced by the weight and speed of trains and damage on wheel and rail running surfaces as trains pass over them.

This is why highly elastic, micro-cellular rail pads and base plate pads made of EPDM are used in fastening systems on ballastless track. When used on ballast beds, the pads reduce high-frequency vibrations to such an extent that they largely prevent ballast from being shattered, thus reducing maintenance costs.

Modern rail fastening systems with elastic base plate pads allow rails to deflect, make use of the load-transferring effect in rails and disperse any vertical forces that arise. The elasticity in **micro-cellular foam Civicell rail pads and Ciplacell base plate pads** can be optimally adjusted to live loads as per clients' specific requirements.

These highly elastic components also provide insulation against vibrations and structure-borne sound.

The result is high travelling comfort, a longer service life for elastic components and protection for permanent way and vehicles, leading to a reduction in maintenance costs.

## Civicell rail pads

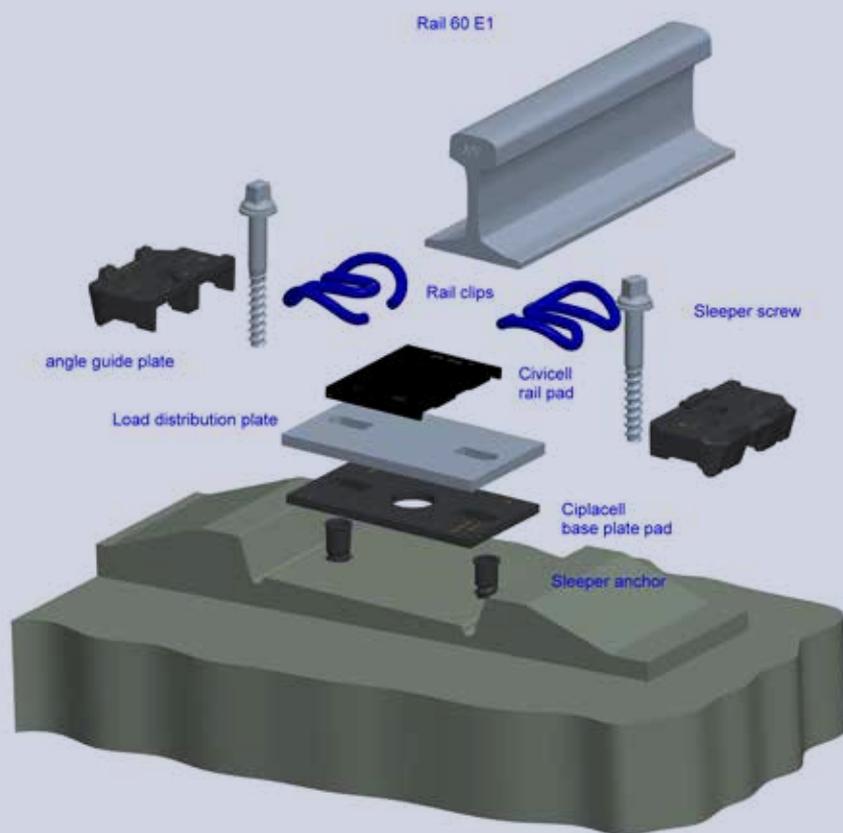
Rail pads are installed directly beneath the rail base to protect the permanent way and increase elasticity in ballast beds. Elastic EPDM rail pads can be manufactured in a wide variety of designs for different rigidities as per client requirements for different needs, ranging from metros and tramways through to high-speed traffic, thanks to their micro-cellular structures ( $c = 20\text{--}200 \text{ kN/mm}$ ).

## Ciplacell base plate pads

The elasticity required in ballastless track systems is guaranteed thanks to highly elastic base plate pads, fitted between the ribbed base plates and the supporting concrete slab (spring stiffness  $c = 5\text{--}60 \text{ kN/mm}$ ). This ensures a load-spreading effect in the rails, thus reducing significantly any vibrations and structure-borne sound.



# CHARACTERISTICS



## Characteristics of rail pads and base plate pads made of closed-cellular foamed EPDM elastomer

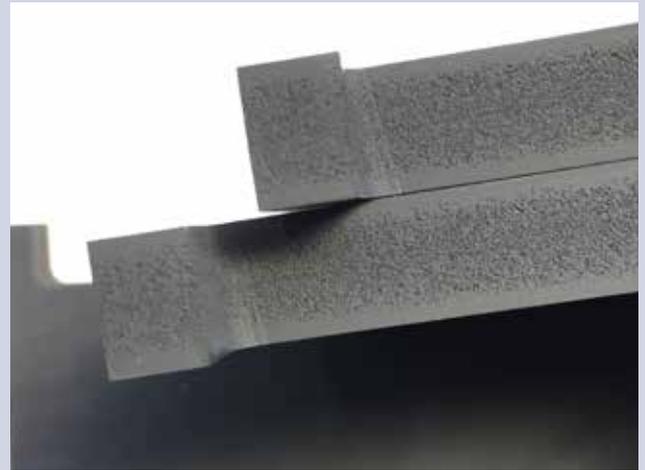
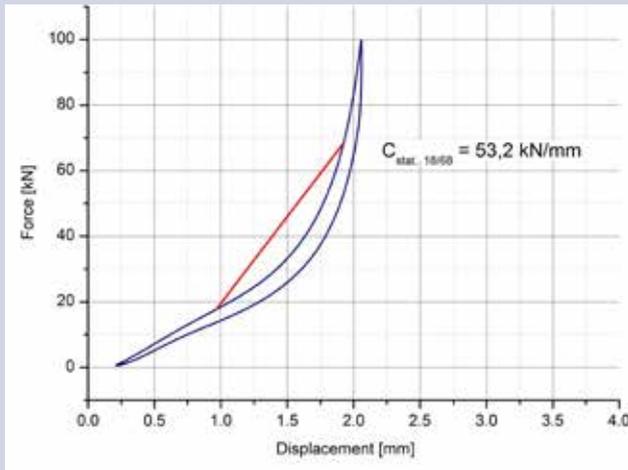
**Civicell** and **Ciplacell** are made from a special, modern, synthetic rubber with an extensive range of uses. This exceptional rubber offers excellent resistance to ageing, ozone, sunlight, weathering and environmental influences.

Other outstanding features include its excellent elasticity, first-rate structure-borne sound insulation, its hydrolysis resistance and a comparatively low variation in spring stiffness within a working temperature range between  $-40\text{ }^{\circ}\text{C}$  and  $+100\text{ }^{\circ}\text{C}$ .

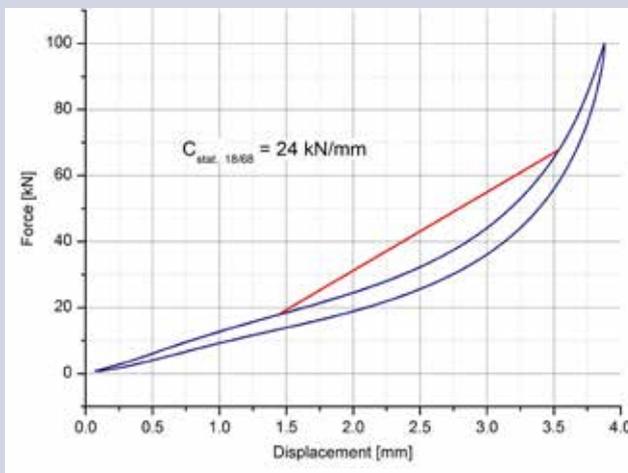
All rail pads and base plate pads are specifically manufactured to client requirements in terms of shape and rigidity for each individual construction project.

The image on the left shows possible components in a rail support point.

# STIFFNESS



The image above gives a clear picture of the micro-cellular structure of the material.



The upper diagram on the left shows an example of the static stiffness of a **Civicell ZW 700** while the lower diagram contains the static stiffness of a **Ciplacell ZWP** measuring 360 mm x 160 mm x 12 mm.

The contents of this publication are the result of many years' research and experience gained in application technology. All information and instructions are based on the best knowledge available to us; they do not represent a warranty of suitability for particular tasks nor do they exempt the user from conducting their own tests and checks, including verifying the rights of third parties. Any liability for damages of any kind and on whatever legal grounds arising from recommendations taken from this document is excluded. We reserve the rights to make technical modifications in the course of product development.

Calenberg Ingenieure GmbH

Am Knübel 2-4  
D-31020 Salzhemmendorf

Tel. +49 (0) 5153/94 00-0  
Fax +49 (0) 5153/9400-49  
info@calenberg-ingenieure.de  
www.calenberg-ingenieure.de

