

# POWER WEIGHT

POWER WEIGHT - DAS LEISTUNGSGEWICHT  
TECHNICAL INFORMATION

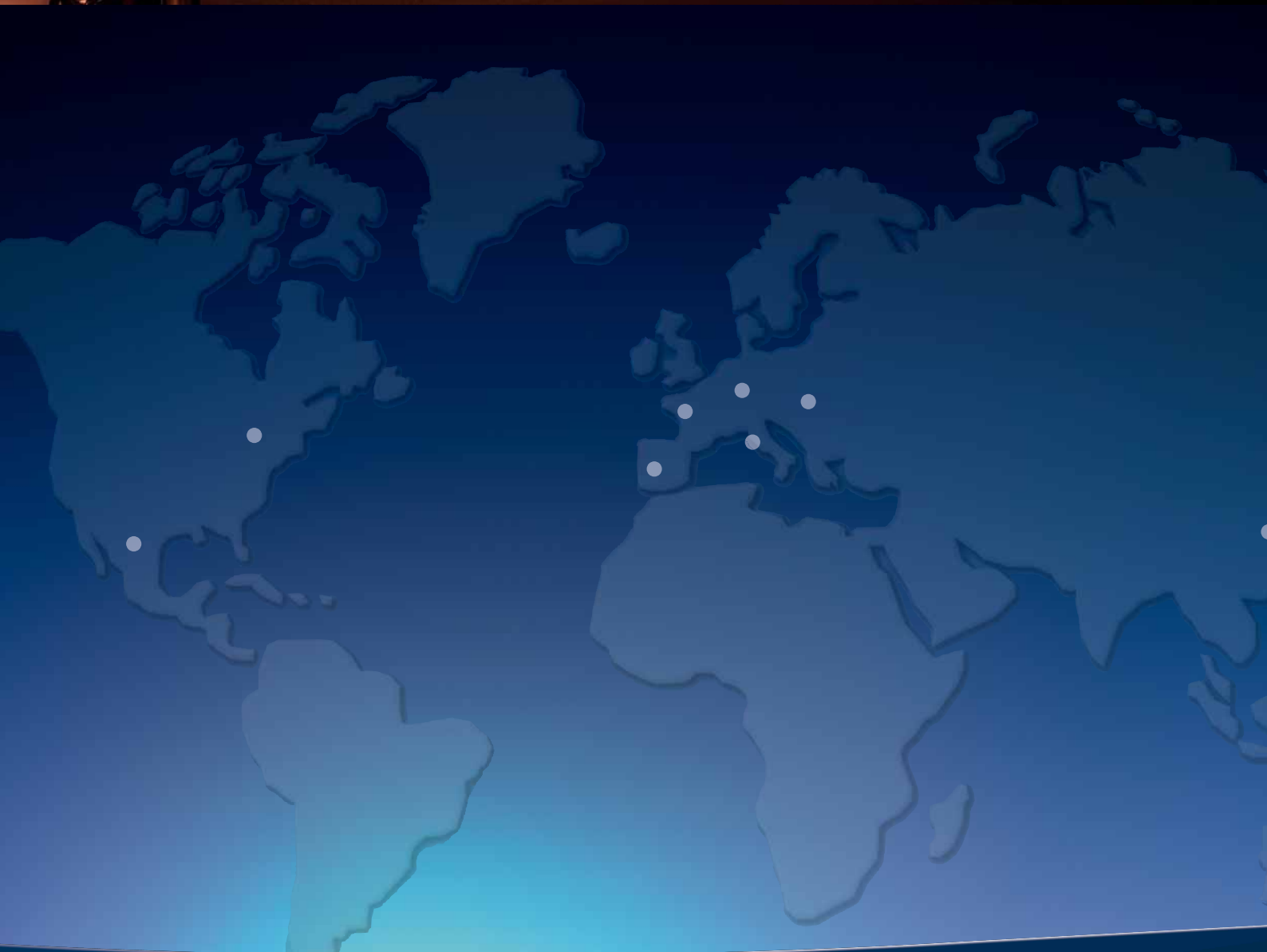


[www.hofmann-powerweight.de](http://www.hofmann-powerweight.de)



# THE NO. 1 FOR BALANCE WEIGHTS

You'll find our headquarters in central Germany – but you'll find our service wherever you go.



Whether you are involved in original equipment development or are a supplier to the aftermarket, you will always profit from the comprehensive expertise of market leader HOFMANN POWER WEIGHT – across our entire range of products.

### A WIDE RANGE

We develop and produce OEM weights and high-quality universal weights for cars, freight vehicles and motorcycles. At our German sites, we produce clip, knock-on and adhesive weights from zinc and lead. In addition to our premium balance weights, we have expertise in the areas of pole sleeves for starter batteries, industrial weights and seals. For information on this, please refer to our specialist catalogues.

### AT THE HEART OF MOTOR SPORTS

From the Nürburgring to Silverstone, from Monaco to Indianapolis – when racing vehicles of various power classes tear round the

track, HOFMANN POWER WEIGHT's balance weights are right there with them. As a partner and supplier of balance weights for motor sports, both we and our customers benefit from our products being used under extreme conditions. The valuable technical expertise we gain is something we can put to use directly in our mass-production products.

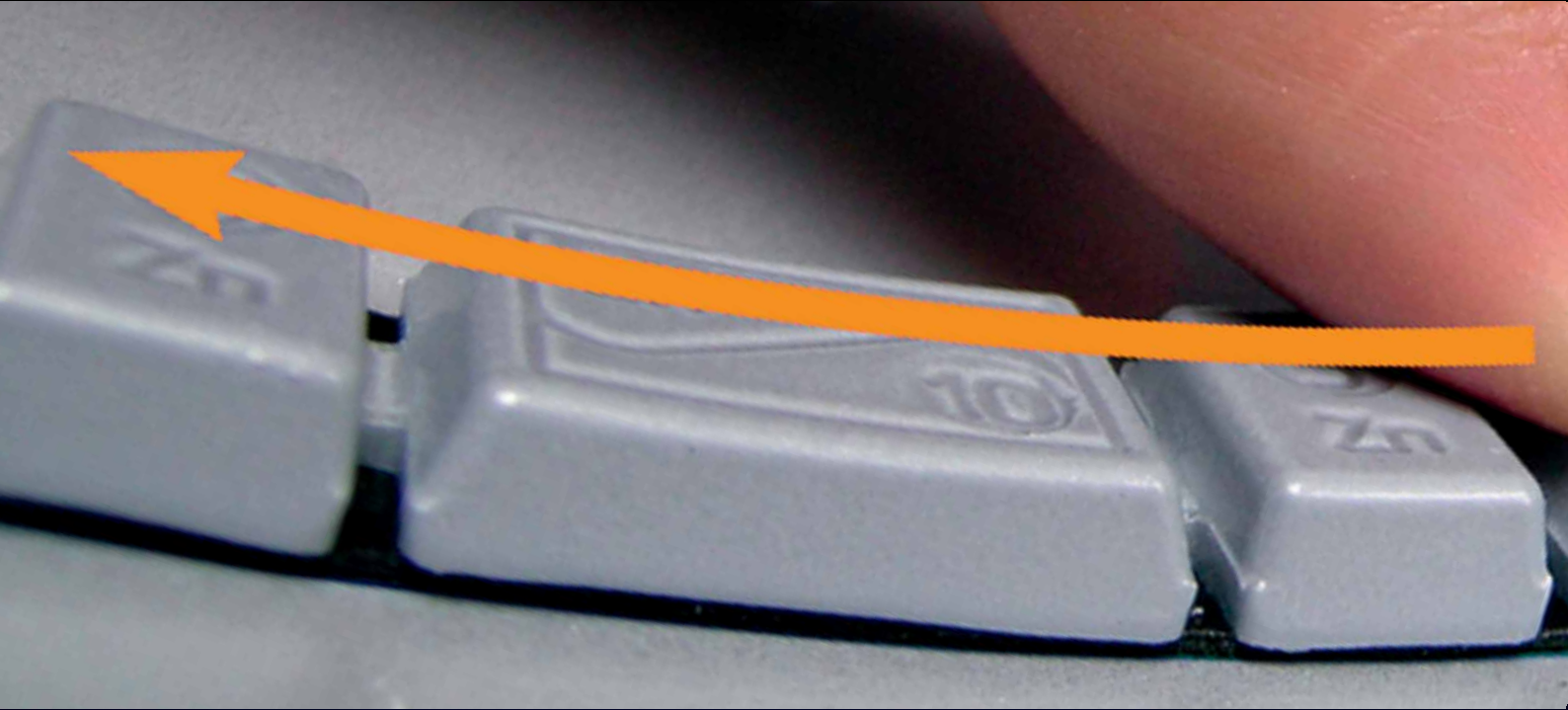
### BALANCE IS THE KEY

Tests conducted by car and tyre manufacturers provide clear evidence that small balance weights are there for a reason. The driver of a vehicle without correctly balanced wheels is not only compromising on comfort, but is also

risking both their own and others' safety. What's more, they are incurring unnecessary costs due to disproportionate wear. With HOFMANN POWER WEIGHT balance weights, not only are you working with a high level of quality in what is a sensitive area, but you are also siding with safety when it comes to balance precision and durable balance properties. For more information, please visit our homepage at [www.hofmann-powerweight.de](http://www.hofmann-powerweight.de) or contact us directly via email at [sales@hofmann-powerweight.de](mailto:sales@hofmann-powerweight.de).



# CORRECT INSTALLATION: WHAT YOU



Correctly balanced wheels ensure a safe and pleasant ride while eliminating the problem of premature wear. If our weights are to do their job correctly over the long term, it is essential that they are installed correctly.

Our technical information brochure provides various tips for handling knock-on, clip and adhesive weights for cars, freight vehicles and motorcycles. This ensures an optimum fit as well as durable balance performance.

# NEED TO KNOW



# CONTENT

IMBALANCE –  
THE HIDDEN DANGER

6 - 7

BALANCING OF CAR AND  
MOTORCYCLE WHEELS

8 - 9

ADHESIVE WEIGHTS:  
WHAT YOU NEED TO KNOW

10 - 11

INSTALLING AND USING  
KNOCK-ON AND CLIP WEIGHTS

12 - 13

WHY CHOOSE HOFMANN WEIGHTS?  
WHY BALANCING?

14 - 15

# IMBALANCE – THE HIDDEN DANGER



## Types of imbalance

At a speed of 100 km/h, the centrifugal force of a 10 g imbalance is equal to that of a sledge hammer. Double this speed and the forces involved quadruple. Vehicles with poorly balanced wheels become dangerous:

- The steering vibrates
- More stress on wheel suspension components and bearing points
- Noticeable vibrations in the interior
- Body subjected to greater physical stress
- Can result in increased brake wear
- Increased heel and toe wear on tyres
- Braking distance increases when you brake at high speeds

**Two different types of imbalance can be found on a wheel:**



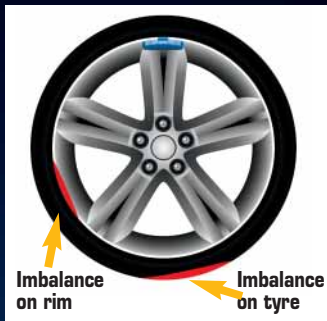
Static imbalance: The wheel has a tendency to jump.



Dynamic imbalance: The wheel has a tendency to wobble.

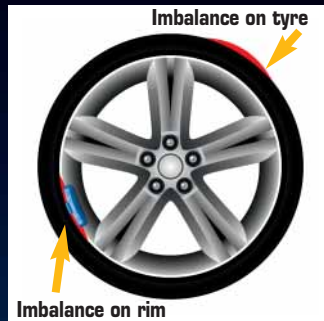


## Correcting imbalance on tyres and rims



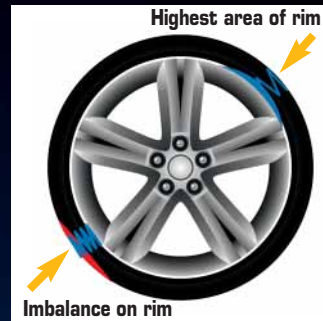
### 1. Balancing

The extent of the tyre and rim imbalance is measured by the balancing machine and the problem is corrected using HOFMANN POWER WEIGHT balance weights.



### 2. Matching

This workshop procedure involves rotating the tyre on the rim until the sources of imbalance on the rim and tyre are opposite each other. The residual imbalance is compensated with HOFMANN POWER WEIGHT balance weights.



### 3. Smooth running optimisation

A defect of form involving the rim can only be compensated by uneven tyre deflection. Smooth running optimisation involves placing the heavy and hard area of the tyre opposite the highest area of the rim. The residual imbalance is compensated with HOFMANN POWER WEIGHT balance weights.



### 4. Balancing on the move

Whether we are talking about stationary balancing or smooth running optimisation, only the wheel is optimised in terms of smooth running. However, the vehicle and the wheels need to be considered as a single unit.

# BALANCING CAR AND MOTORCYCLE



## Balancing car wheels

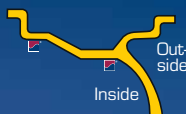
1. Balancing using clip/knock-on weights for both planes. This approach requires the least mass for balancing. This option is used by a large number of car manufacturers.



2. Balancing using adhesive weights for both planes. The weights are stuck onto the inside/ outside at the outermost positions.



3. Both adhesive weights are stuck onto the inner rim of the road wheel.



4. The outer balancing plane is moved inwards and the adhesive weight is stuck inside the inner rim of the road wheel in the vicinity of the brake disc. A clip/knock-on weight with cast-in or separate retaining springs is secured to the inner rim flange.



5. An adhesive weight is used on the outside of the rim. It is stuck in place at the outermost position. A clip/knock-on weight with a cast-in or separate retaining spring is used on the inner rim flange.



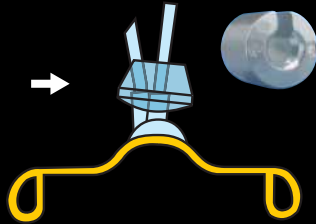
6. On the outside of the rim, a clip/knock-on weight with a cast-in or separate retaining spring is used on the rim flange. An adhesive weight is used on the inside of the rim. The weight is secured in the outermost position in the inner rim of the road wheel.



# WHEELS

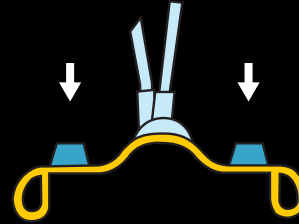
## Balancing motorcycle wheels

### COMPENSATING STATIC IMBALANCE



HOFMANN POWER WEIGHT balance weights are used depending on the spoke nipple diameter. The weight is secured to the spoke nipple in the centre of the rim. For further details concerning motorcycle weights, please refer to our catalogue or visit [www.hofmann-powerweight.de](http://www.hofmann-powerweight.de).

### COMPENSATING DYNAMIC IMBALANCE



Dynamic imbalance is frequently also referred to as an imbalance in 2 planes. Type 715 and 716 adhesive weights from the HOFMANN POWER WEIGHT range are ideal for compensating this kind of imbalance. These weights can be stuck onto the narrow rim shoulder (to the left and right-hand sides of the spokes) provided that the glued surfaces are within the permissible inclination angle of 15°. If the glued surfaces exceed an inclination angle of 15°, there is a risk of the adhesive weight losing its ability to adhere due to the centrifugal forces involved. The balancing machine will indicate the position of the weight and its size in grammes for both planes.

### BALANCING SPOKED WHEELS



The clip weights for spoked wheels are attached to the spoke nipple using HOFMANN impact tool no. 385/1. This is the only way to avoid installation errors, as the HOFMANN tool transfers the force necessary for ensuring that the weight is clamped securely and precisely in place. If other tools are used for installation or if the weights used can only be pressed together with a pair of pliers, the weights may work loose and fly off during travel.

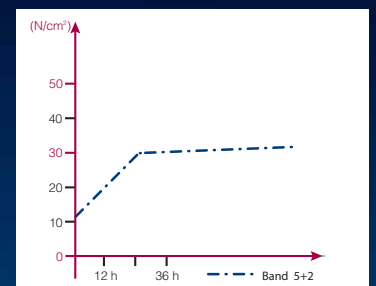
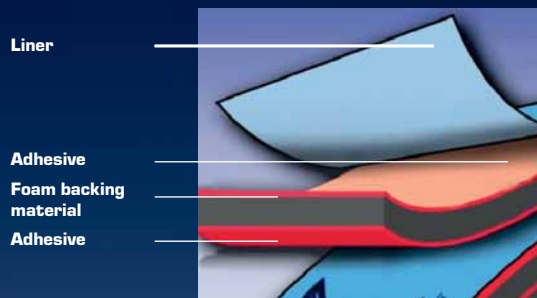
# ADHESIVE WEIGHTS: WHAT YOU REALLY



## Information about adhesive strips

By following our handling instructions for adhesive strips, you can ensure the best possible long-term durability. HOFMANN POWER WEIGHT adhesive weights are compatible with all the various types of rim available on the market. They even offer maximum adhesion when used on finished surfaces such as those with a plastic or chromium coating.

- OEM adhesive strip
- Various backing material thicknesses
- Temperature-resistant from  $-40^{\circ}\text{C}$  to approx.  $+250^{\circ}\text{C}$ . In motor racing contexts: up to approx.  $650^{\circ}\text{C}$
- 90% of final adhesive strength achieved after 24 hours (depending on influence of temperature)
- Partially overlapping protective film for easier handling
- Weight can be moved immediately following adhesion and with careful handling
- Adhesive strip can be removed and barely leaves a trace



24 h after installation, 90% of the final adhesive strength is achieved. The final adhesive strength is achieved after 72 h.

# NEED TO KNOW

## Installing adhesive weights

In the course of 2005, allrim manufacturers switched over to "water-soluble varnishes". Up until then, "varnishes containing solvents" had been used. All varnishes have wax added to them that allows gas to escape when the coat of varnish is baked while at the same time avoiding pimples. The solvents that used to be added compensated for the wax almost completely. With the new water-soluble coats of varnish, this is no longer the case, resulting in different wax concen-

trations on the glued surfaces that can only be dissolved by means of wet cleaning (e.g. with IPA 70%). It is only by pre-treating the glued surfaces in this way that the necessary surface stress values of > 32 mN/m can be achieved. Without any pre-cleaning, the adhesion values drop below 28 mN/m and there is either no proper adhesion or the weights may work loose from the rim within 1 or 2 days for no apparent reason. The rim inclination should not exceed an

angle of 15°. Unobstructed operation of the brake system (calliper) must be ensured.

**TIP FOR PROFESSIONALS:**

24 h after installation, 90% of the final adhesive strength is achieved.

The final adhesive strength is achieved after 72 h. Storage requirements: As far as possible, adhesive weights must be stored in a cool, dry and dark location.

If the storage requirements are not properly observed, the adhesive properties may be impaired.



**Pre-treating the rim**  
Clean the rim thoroughly with a cleaning agent that is compatible with varnish (e.g. IPA 70%) in order to remove any residual grease, silicone or adhesive.

**Please note:** Before attempting this, test the solvent on a concealed area to ensure that it does not damage the rim surface. The glued surface must be completely dry and free from grease and dust. A minimum of 16°C is required in terms of both the room temperature and the rim temperature.



**Pre-bending the weights**  
Cut the adhesive weights or pull them apart to obtain the correct grammage (as calculated).

**Please note:** If you twist the weights to separate them, you will damage the glued surface. Mould the shape of the weight to match the rim radius (with protective film). You need to bend the weights gradually, otherwise they will break apart at the joins. You can bend the weight to a slightly lesser extent than the rim radius.



**Sticking the weights on**  
Remove the protective film.

**Please note:** Do not touch the glued surface after peeling off the film. Attach the weight to the calculated point on the rim, making sure that the calculated grammage is distributed evenly either side and that the weight is parallel with the edge of the rim.



**Securing the weight**  
Press down on the weight hard, working from the centre and to the left and right. A minimum pressure of 100 kPa is required.

# INSTALLING AND USING KNOCK-ON AND



## The 2-part weights that are referred to as “clip weights”

Weight types 260, 261 and 280 for steel and light metal rims are available with separate retaining springs. 2-part weights (referred to as “clip weights”), which are primarily

used in an OEM context, can also be installed professionally by specialist tyre dealers at any time using HOFMANN POWER WEIGHT weights and the appropriate tools. All you need for

this are the type 336/1 tyre compression tool or the pneumatic tyre compression tool as well as the type 331/43 clip fitting tool. To install these weights without any problems and

without damaging the rim, simply follow the steps below.



Use the 336/1 tyre compression tool or the pneumatic tyre compression tool to squeeze the tyre off at the point where the weight is going to be installed just far enough in order for the rim flange to be exposed. Attach the retaining spring at the required point.

Remove the tyre compression tool (336/1). The retaining spring will be pressed between the rim flange and tyre, where it will remain secure.



Use the clip fitting tool (331/43) to lift the spring so that you can push the coated weight underneath it. Gradually tilt the clip fitting tool back so that the retaining spring is able to engage in the specially provided recess in the weight body.



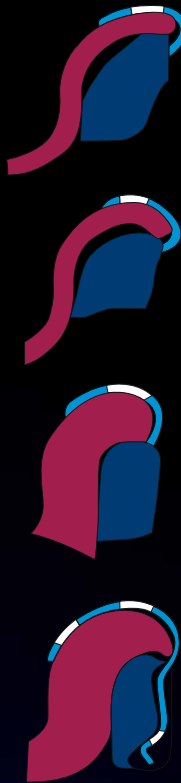
# CLIP WEIGHTS



## Installing knock-on weights

Prior to installation, select the appropriate weight from the HOFMANN POWER WEIGHT range on the basis of the rim shape. The choice is determined by the rim design. The rim flange thickness varies (steel rim/aluminium rim) and different rolling processes are used. To install the weights, no more than two forceful knocks should be used. A higher number of knocks can damage the coating of the weights.

HOFMANN POWER WEIGHT is the original weight. Our weights are developed in conjunction with the OEMs to ensure an optimum fit. A special retaining spring keeps the weight securely attached to the rim over the long term.



APPLICATION

### NOTE

Whatever the rim type, our installation requirements must always be observed whenever HOFMANN POWER WEIGHT balance weights are used and installed, as must the requirements of the vehicle and rim manufacturers and the approval terms of the technical inspection authorities. Using the wrong weights can impair brake operation or result in damage to the track rod or track rod ball joint. We can assume no liability for loss or damage resulting from the incorrect or deficient installation of balance weights or because of a failure to observe applicable associated requirements. A plastic hammer (or similar) should be used to install all coated clip/knock-on weights.

# WHY CHOOSE HOFMANN WEIGHTS? WHY



## Why coated weights?

Coated weights prevent your rim from sustaining damage due to contact corrosion. The special HOFMANN POWER WEIGHT coating is perfectly matched to the rim colour and provides protection against the weather and stones. Coated weights from HOFMANN POWER WEIGHT are subjected to a 750-hour salt spray test pursuant to DIN 50 021 SS and ASTM B 117-73 in accordance with the requirements of the automotive industry (OEM). This special coating ensures that no corrosion occurs even under the harshest conditions.

### ELECTROCHEMICAL SERIES

Electrical charging of various materials

- Al -1,69    ■ Zn -0,76
- Fe -0,44    ■ Pb -0,13
- Cu +0,35    ■ Au +1,38

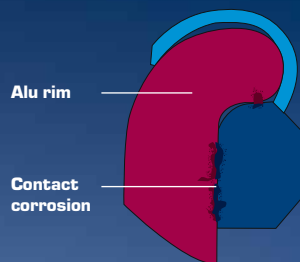
The more negatively charged material will be attacked by the less negatively charged material.



**Uncoated weights:**  
Contact corrosion of surface.



**Coated weights:**  
Sealed epoxy finish. At least 0.1 mm thick. Approx. 5% aluminium pigments, embedded in synthetic molecules. The result: no oxidation of surface.



# BALANCING?



## Why choose HOFMANN weights?

### **SUPERIOR CORROSION PROTECTION**

- All-round high-quality OEM plastic coating
- Protection against environmental influences
- Protection against stones

### **PRECISE BALANCING WITH KNOCK-ON WEIGHTS**

- Exact grammage
- Optimum spring stiffness for secure retention in acc. with OEM standard

### **PRECISE BALANCING WITH ADHESIVE WEIGHTS**

- Use of high-quality OEM adhesive strip
- Assured adhesive force of at least 30 N/cm<sup>2</sup>
- Resistant to ambient temperatures from 40°C to 250°C (when used in context of motor sports: up to ambient temperatures of 650°C)

### **SERVICE MADE IN GERMANY**

- German brand quality
- Used by all well-known car manufacturers (OEM)
- Short delivery lead time; small quantities also possible
- Large product range
- Local customer service
- Constant quality inspections certified to ISO TS 16949
- Certified to ISO 14001
- Trialled in motor sport applications

## Why balancing?

### **INCREASED SAFETY**

- Optimum function of ABS, ESP, optimum braking distance



### **LESS WEAR**

- In terms of tyre abrasion, on axle bearing/shock absorbers



### **INCREASED COMFORT**

- No vibrations on steering wheel and inside interior



COATED



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