



SOUNDS OF SILENCE
Zeppelin's tried and tested
anti-honking systems

Silo technology

ENGINEERING YOUR SUCCESS



Zeppelin Systems, the world leading plant manufacturer for high quality bulk material and liquids handling, has remarkably grown over the past 60 years. We cover the demands of a wide range of industries and supply all plant manufacturing services from one single source, whether basic engineering, in-house production of components, final assembly or comprehensive customer service. Thanks to our financial strength and our global network we have long been a reliable partner for our customers.

Every Zeppelin plant is developed according to the clients' specific requirements and realized thanks to our customized innovative processes and technologies.

The knowledge we have acquired over more than 60 years of plant manufacturing and the world's largest network for bulk material handling are the key to providing ideal solutions whatever the challenge. After all, your success is our goal.

Zeppelin plant engineering – business fields

Polymer Plants

Plants for plastics producers and forwarders

Plastics Processing & Rubber Plants

Plants for the plastics processing and rubber industry

Reimelt Food Technology

Plants for the food, confectionery and bakery industry

Henschel Mixing Technology

Mixers, mixing systems

Silos & Filters

Silo technology and filters

Components

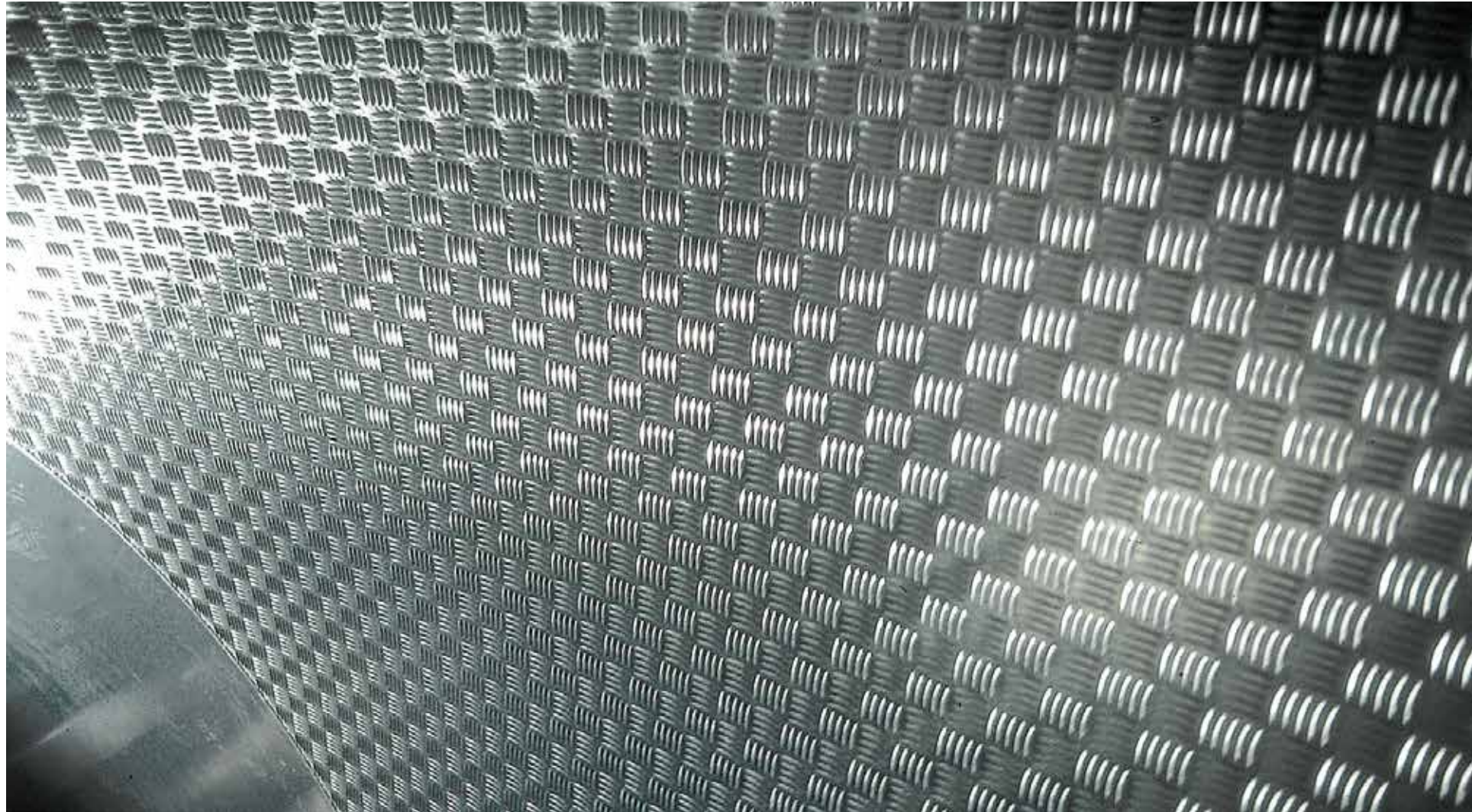
Diverter valves, rotary feeders, separators, sifters ...

Customer Service

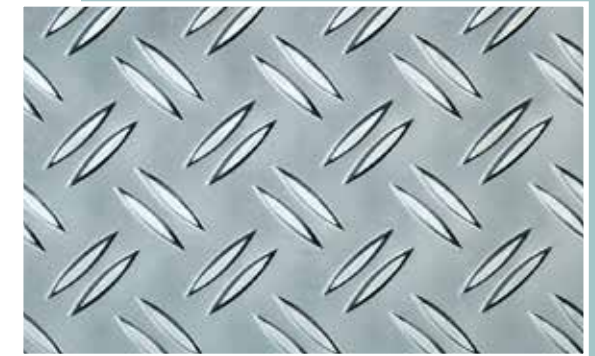
Assembly, maintenance, spare parts

Quality Service

Services in quality management



Also suitable for retrofitting:
Honking silos can even subsequently
be equipped with goffered plate.



Looking into the interior of a silo:
By installing checkered plates, a
shear zone near the silo wall is
created – and honking is avoided.

Thanks to the structured surface of
the plate the wall friction coefficient
is changed.

INTELLIGENT SILO TECHNOLOGY

Proven solutions by the silo specialist

For anti-honking systems, a general distinction must be made between silos for storing powders or pellets as well as between new silos and retrofitted ones. As silo specialist, Zeppelin provides economic and process-reliable solutions for all requirements.

Of course, preventing the problem before it occurs is the most economical solution. Therefore, Zeppelin has developed an intelligent system especially for new silos which are designed for the storage of problematic bulk materials.

Wall plates with structure

In order to avoid honking, the cylindrical shell of new silos is partly manufactured from checkered or structured plate. The checkered surface showing to the interior of the silo alters the flow characteristics of the bulk material during discharge – a so-called shear zone will develop near the silo wall. For retrofitting existing silos, plates will be mounted internally to the silo wall, which also creates a shear zone. This solution is appropriate for free-flowing pellets as well as for powders.

Nothing is impossible!

Discharge pipes – suitable for retrofit installation

Another possibility for refurbishing a silo is the installation of discharge pipes. This alternative, however, is very expensive and only appropriate for free-flowing bulk material. For all cohesive products – and, thus, for nearly all fine-grained powders – the product cannot be discharged via the discharge pipes.

The discharge pipes are mounted centrally or fixed to the inside or outside silo wall. The product will then be extracted from the upper section of the silo, thus reducing the pressure on the flowing bulk material significantly.

However, by discharging from the upper part, the bulk material which has been fed last into the silo is drawn off first – creating a funnel flow. This solution is therefore not adequate for bulk materials that age quickly. Furthermore, this solution requires sufficient clearance beneath the silo to connect the various outlets.



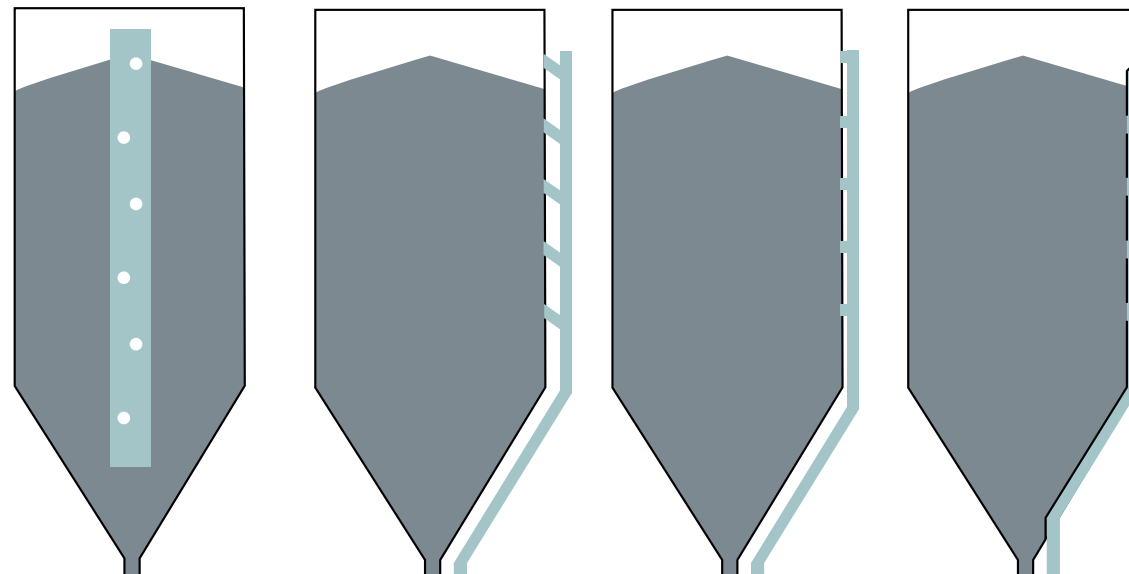
Honking silos can become a problem

The phenomenon of honking silos has driven quite a few plant operators to despair. Silo plants located close to residential areas or in an industrial area with strict environmental and noise protection regulations and which are not equipped with an anti-honking system might be shut down by the authorities.

Another problem is the so-called quaking of silos during discharge of bulk materials. The shocks which arise in intervals of 5 – 30 seconds may have fatal effects on the silo, the foundation or on the steel structure.



Discharge pipes can be used in various different ways. Precise knowledge of the flow characteristics of the bulk material is the key to selecting the optimum solution for each individual case.



The following diagram gives you an impression of the extreme annoyance due to noise caused by honking silos:



Good for you if you have never heard of it!

Honking of silos is a phenomenon which depends on the bulk material and not on the silo. In other words, vibrations or even honking may occur depending on the flow characteristics of the bulk material and the corresponding wall friction angle. In general, bulk materials which generate dynamic loads during discharge from the silo may produce noise. The bigger the silo and corresponding pressures – the higher the risk of honking.

Anti-honking system

	PET	PA	PBT	PP	PE	PVC	TiO2
Required	X	X	X				X
Recommended						X	
Not necessary				X	X		

The table above lists some bulk materials and their risk of producing noise. Certainly, the risk depends on several factors, e.g. the silo capacity, its material and surface, and on the composition, type and the temperature of the bulk material (subject to change).



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