Welcome to Wieland Lufttechnik
Industrial vacuum technology for all kind of industries

All vacuum systems can be modified on customer demands!
Product groups:

Portable industrial vacuums

Stationary vacuum and dedusting systems

Truck or trailer mounted vacuum systems
Wieland Vacuum Systems in Steel Plants
Enclosed please find information material concerning the application of vacuum suction units in steel plants.

Basically we have the following areas for cleaning and material handling purposes:

- Melt shop hall with Electric Arc Furnaces (EAF), Ladle Furnace for scrap
- Continuous Caster for casting of steel bars
- Storage of bulk material like limestone bunkers, coal / coke bunkers, storage halls, etc.
- Pelletizing plant / Sinter plant to homogenize the raw material.
- Blast furnace area and slag sand crushing plant
- Rolling mill for flat products and bar mill for wires
- Other application as tube mill and forging presses.

Of course it is always important to distinguish between cleaning and collection of material for recycling. With regard to cleaning there is nothing to say, as it is self-explanatory to everybody. We have to point out, however, that especially the cranes and crane rails as well as the surrounding areas of the electro arc furnaces or blast furnaces have to be cleaned.

For the production, storage and transport of sinter the material recycling is of special interest. We would like to point out one special field of application i.e. the scales resulting from the production process of billets, bars or rods. As you know scales are blistering during the manufacturing process and cause deposits of scales under the cooling bed or besides the bar rod mil. It is assumed that 1% of the production is scaled in the annealing area. Scales in turn contain 65% of iron which can be fed back immediately to the production process. This means that the suction unit is amortised within short.
Wieland Vacuum Systems
in Steel Plants

In front of an electric arc furnace during scrap melting
Wieland Vacuum Systems in Steel Plants

Do you have such cleaning problems?
Going Green by Keeping it Clean
Using industrial vacuum technology will change the whole appearance of your plant.

Let’s have a look to impressions

Before

and

After

professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
Typical problems in a steel plant – before and after professional vacuum cleaning
During the melting process of scrap in an EAF Furnace, a lot of dust is created. This dust settles all over the production hall, especially on platforms and ways where people are working. Due to health reasons and to avoid accidents, this dust has to be sucked away.

This should be done with a stationary vacuum system, e.g., S-2100 connected to a pipeline network.

Mainly extracted material:
- Steel plant dust
- Slag sand

Note: This dust can be also a valuable raw material.
Wieland Vacuum Systems in Steel Plants

Stationary Vacuum System in a Melt shop Maintenance Bay
The drawing shows the installation of a suction pipe work system in a melt shop hall with electric arc furnaces where they use three cranes. The steel plant has installed a stationary vacuum system to the pipe work for general cleaning purposes. During the cleaning process the pipeline which is mounted on the cranes can be connected to the main system by means of a flexible suction hose.

A pipework system connected to a mobile suction unit. In order to separate material which should be collected and discharged onto a conveyor belt an intercept hopper is used respectively in order to get a more faster and easier transport of the collected material a bulk container is used between suction point and vacuum unit.

Wieland Vacuum Systems in Steel Plants
Wieland Vacuum Systems in Steel Plants

This is a pipe work for stationary vacuum system at a **continuous caster**. The three branches (in blue, 8m, -3.5m) are leading down to the caster “cellar” and under the cooling beds at the caster exit whereas the other direction is used to clean different areas along the machine. In between there is a intercept hopper in order to separate dust and other residuals from the scale which will be collected under the cooling beds.

If the collected material is be expected to be too hot a separate intercept hopper with an asymmetric cone should be linked in the suction line before the vacuum system.

**Don’t forget:**
Collected scale can be reused for tapes, paint and of course as recycling material.
Stationary Vacuum System along an pickling line.

After the rolling mill the strip material has to be descaled and cleaned from other residuals of the process. This will be done in a „Pickling line“. In order to have a continuous operation a entry loop accumulator system is mounted below the pickling line. During the bending of the metal strip scale particles laying around as fine dust.

A stationary vacuum system is the solution to collect all that fine dust. At Voest, Austria a system is working with a pipe work of 370 m length.
Portable Vacuum Units or Stationary Vacuum System

are the best solution to clean the floor under the loop storage systems from scale dust which peels off from the strip. Also from here the scale can be recycled.

(Closed loop strip storage at Arcelor-Mittal, Bremen)
Line welded steel pipes are manufactured with a conduction flux welding process. The surplus welding powder which is required for this process can be recycled if it is extracted from the steel pipe with an automated vacuum extraction system.

The steel plants usually produces pipes up to a length of 45 m with diameters from 400 to 4000 mm and wall thicknesses between 6 and 180 mm.

The vacuum system can be an industrial vacuum cleaner like the IS-36 Filter.
Sometimes the welding line is on top of the pipe then the procedure is the same but here the residual flux powder can be removed with a rotating brush to a suction hood.

On the picture you see a stationary vacuum systems which is serving 3 welding system. Dependent on the number of the simultaneously operating welding machines 1 or 2 vacuum pumps are running. The same configuration can be used for inside welding, too.
Wieland Vacuum Systems in Steel Plants

Vacuum System for Steel Pipes Welding Plants

Sucking of flux material during welding process
Wieland Vacuum Systems in Steel Plants

Vacuum System for Steel Pipes Welding

From the strip edge milling machine a lot of metal chips are falling down to the ground and even sometimes they are found on the strip surface where they can damage the guide rolls.

With a vacuum unit ‘monobloc MB-RD’ in connection with a nozzle assembly mounted over the strip surface it is possible to suck this residuals away automatically.
Wieland Vacuum Systems in Steel Plants

Vacuum System for spiral pipes welding

Example of use: Rolling Mill

The surface of the metal strip is cleaned before the tension leveller with a sword brush to protect the rollers against damages caused by metal shavings etc. (In the example shown, the rolls are also brushed.)
Automatic cleaning of crane ways

Wear of wheel bearings, wheels and rails caused by layers of dust and dirt can lead to considerable cost for maintenance. Especially in the heavy industry like steel plants crane ways are sometimes buried under layers of dust. Due to their design, conventional cleaning of the crane rails is almost impossible. We designed a special solution for cleaning crane ways. A compact industrial vacuum cleaner is permanently mounted to the crane. On both sides over the crane rails travelling suction nozzles are installed which remove the accumulated material of their respective area. During crane movement the material is automatically collected in a container mounted to the vacuum cleaner. The collection container is discharged via a pneumatically or electrically activated slide valve into a down pipe which is usually positioned at the end of the hall and empties the suction material into e.g. a container. Then the collected material can be easily transported away and disposed off. The suction systems can either be controlled from floor level or from the crane drivers cabin.
Wieland Vacuum Systems in Steel Plants

Using Skips then the dust or spillage will be extracted at the loading bay in the batch house. Using conveyor belts then the dust or spillage will be extracted along the galleries.
Wieland Vacuum Systems in Steel Plants

Batch House

Most of the steel plants are running a batch house in order to feed the various materials to Blast furnaces. In this process we have crushing and mixing where dust occur and conveyor belts where a lot of spillage is laying around.

Sintering Plant

It is the function of the sintering plant to process fine grain raw material into coarse grained iron ore sinter for charging the blast furnace. Same as in the pelletizing plant a lot of dust, spillage and ashes occur during the process.

The standard solution is a stationary vacuum system with a high performance because normally a big pipeline system has to be connected. The collection filter hopper should be installed over a conveyor belt in order to discharge the collected material onto it.
Wieland Vacuum Systems in Steel Plants

Bulk Handling

In big steel plants where you have a lot of places to clean and big quantities of material have to be collected e.g. storage bunkers it makes sense to use a mobile truck or trailer mounted vacuum system.

Those vacuum systems can be connected from the street to pipe work systems inside the building where the cleaning job can be done. It is even possible to use intercept hoppers if the extracted material should be discharged back to the process. Mobile vacuum systems can be supplied with explosion protection equipment according to ATEX regulations.
Casting of Ingots and blooms

In this process the liquid iron will be not processed in a continuous caster. Here the steel is cast in the desired ingot format by using moulds. After the cooling process the moulds are removed and the remaining steel blocks have to be cleaned from sand and other residuals before they are transported hot to the blooming mill. This job can be done easily with a MaxVac ECO 220 and if necessary combined with a intercept hopper. Sometimes the sand can be reused.
Steel wire and rebar milling

Along a rolling mill for steel wire a lot of scale can be extracted. This scale is a valued material for reuse. The lubricant from the ball bearings and the air borne dust are forming a very abrasive mixture which destroys the mechanical parts. The easiest way to get rid of this “grease” is to clean it with a mobile vacuum cleaner e.g. IS-56. In order to protect the filters a portable intercept hopper would be necessary.
Wieland Vacuum Systems in Steel Plants

Do you have such cleaning problems?

The Solution: VacTrailer S-1200
A mobile vacuum with a standard container which can be exchanged and discharged with a forklift.
Strong enough to extract all scale
Even if it is wet! Liquids no problem!

Model S-1200 Container
Grease and Sump Cleaner FA-450 for Rolling Mill Maintenance

Extraction of old lubrications from ball bearings

Safe material discharge with pneumatically operated discharge piston
Wieland Vacuum Systems in Steel Plants

Application areas for Vacuum Systems in a steel mill

- Cleaning of platforms
- Extraction of scale
- Cleaning of cooling beds
- Maintenance of rolling mill bearings
- Extraction of scale and metal chips
- General cleaning in all areas
Wieland Vacuum Systems in Steel Plants

... and don’t forget the suction tools like hoses and nozzles!
Wieland Lufttechnik
Vacuum technology for all kinds of industry