
THE COOL
MAGAZINE
Dry ice blasting with passion

PROLOG

Dear reader,

Dry Ice is a fascinating material. With a temperature of under -80 degrees celsius it has an immense cooling effect without being moist. It does not melt but does directly transform from its solid state into gas form when heated. During this process its volume expands by a factor of 700.

This second, less known property of dry ice is what our company - White Lion - takes advantage of to thoroughly clean surfaces that they basically look brand new again. This so called „dry ice blasting process" can be utilized to optimally prepare workpieces for further processing or varnishing. It also can be used to free machines, facades, vehicles and much more from contaminants.

In this magazine we want to introduce you to the world of possibilities dry ice blasting does provide. We want to tell you about the technologies and services White Lion offers. Alongside all of the products and services around the dry ice blasting process that is mainly our laser cleaning technology.

With the following pages we hope to get you as enthusiastic about the world of dry ice blasting as we are.

Swen Müller

White Lion

– a short survey of a long story of success

Who and what actually is white Lion? Allow us to quickly introduce ourselves.
White Lion is a company with three central business branches:

1. Development, production and sale of upscale dry ice blasting systems and laser cleaning systems
2. Industrial cleaning and restoration services with dry ice blasting systems out of our own production
3. Service and upkeep of dry ice systems

With these three cornerstones we cover almost all of the needs that may develop in connection to professional cleaning services. Similarly for customers who want to purchase our services externally or want to perform the cleaning themselves. Swen Müller, CEO of White Lion, is looking back on decades of experience in this special sector of dry ice cleaning and thus can offer customized recommendations for solutions for our client´s and costumer´s assignments.

This approach for the singularity of each customer situation is what represents White Lion.

Why should you utilize White Lion? Production and maintenance personnel can drastically increase the profitability of your manufacturing process if you regularly let your machines be cleaned and so detect impending damages. More about this topic you can read from page 28 on.

Furthermore White Lion can automate reoccurring cleaning tasks. With model WL 5000 Robby we offer a dry ice blasting system that speaks all common robot languages. The cleandown time of workpieces thereby reduces to a matter of seconds. Moreover the model WL 5000 Robby is so far the only automated dry ice blasting system that can feed back disturbances in the ice flow. As a result it perfectly integrates into every modern production of surface technology. How that works exactly you can read on page 24.

Cleaning service contractors can build a solid foundation for their services with the White Lion dry ice blasting system. Especially restaurateurs of old timers value the ease with which White Lion systems remove underbodies or clean motors. More about this topic you find on page 26.

White Lion can also help you when the purchase of a whole system is not profitable for your task. The White-Lion-WORKS-Team can be commissioned wth cleaning work all over Europe. Get to know our team on page 30.

An on site consultation yields certainty of planning and clarity about which services are the right ones for our customers. In a mutual dialogue we assess the results and search for the optimal solution.

Even after the purchase, we stand by those who own a dry ice blasting system by White Lion (or IceTech) with service performances and maintenance service. White Lion offers a large supply of accessories and spares. If there really should be the necessity for a maintenance service in our own workshop we provide our customers a surrogate system for their dry ice blasting for the time of the repair.

The whole world of dry ice blasting in one hand.
That is White Lion.

ENVIRONMENTAL COMPATIBILITY

Industrial cleaning does not necessarily have the reputation of being environment friendly. Not without reason because the wastage of drinking water in traditional high pressure water blasting is enormous. Contaminated by chemicals and cleaners the sewage quite often has to be thoroughly and carefully treated. In chemical cleaning processes there additionally is the inconvenience of harmful fumes of solvents or the products of reactions.

For the application of dry ice blasting however neither chemicals nor solvents are needed. Unnecessary environmental pollution is avoided and the personnel is furthermore not exposed to toxic fumes or liquids. As a blasting agent only dry ice - frozen CO2 - is needed. Yet the procedure is CO2 neutral because for the dry ice production only CO2 from natural sources is used. No consumption of non-renewable resources, no greenhouse effect, no contaminated blasting agent residues.

White Lion is that green

eco friendly

HOW DOES A DRY ICE BLASTING SYSTEM WORK?

Dry ice blasting systems use the special qualities of dry ice for the efficient cleaning of surfaces, machines and installation engineering. Therefore the dry ice blasting system mixes up dry ice pellets with compressed air and shoots it out of a nozzle.

If you open the glass top on the upside of a dry ice blasting system you are looking directly into the dry ice container. This container the dry ice pellets get filled into. They are manufactured out of carbon dioxide with the help of a so called „pelletizer". The glass top of White Lion dry ice blasting systems grants an easy checkup of the filling level without letting warm air into the container, preventing the formation of ground fog that would obstruct the view of the filling level.

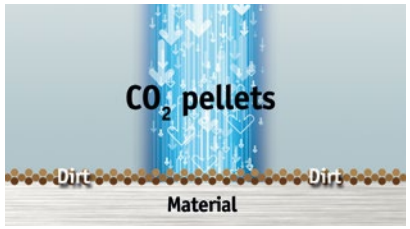
Dry ice blasting systems have to be connected to a supply of compressed air as well as to a mains supply (230V / 50Hz) with a standard bus bar. Turning on the dry ice blasting system an electronic vibrator starts shaking up the contents of the container to give the dry ice pellets the best master flight and reach the turnstile through an opening. The rotating turnstyle transports small portions of dry ice granules away from the opening and mixes them up with the compressed air. The bigger the air and dry ice amount mixed up with the compressed air, the higher the cleaning impact.

The mix of blasting pellets and compressed air will then be pushed into a hose package. Through a blasting pistol at the end of the hose package the user can control the ejection of the dry ice and compressed air composite. Via different nozzles, the dry ice spurt can be formed according to the specific case of application. Round nozzles push the pellets out very compactly and are useful in cases of persistent contamination. On the other hand flat nozzles can be used to time efficiently clean huge surfaces.

Blasting pressure and dry ice pellet amount can be smoothly adjusted using a White Lion dry ice blasting system. With the most gentle setting of 20kg discharge in combination with a dry ice scrambler even most delicate work pieces such as electric assemblies can be cleaned harmlessly. With the maximum of 120kg (model WL 3000) or 140kg (dry ice blasting system model WL 5000 and model WL 3000 Iron) even the most persistent contaminations can be removed efficiently.

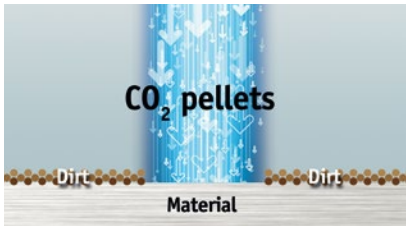
THE DRY ICE BLASTING PROCESS

– three effects for the perfect clean down



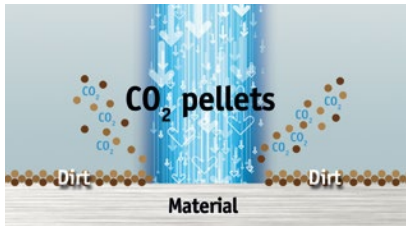
The function principle

The dry ice blasting procedure or dry ice cleaning is non abrasive contrary to traditional blasting techniques such as sand blasting meaning no components of the cleaning surface get removed. Compressed air accelerates the dry ice pellets to almost 1000 km/h and they get blasted directly on to the work piece that needs cleaning. Making contact with the surface three physical effects immediately kick off the cleaning impact of the dry ice.



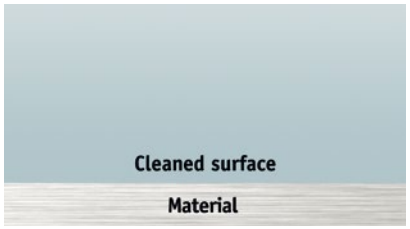
The thermal effect: the selective cooling

The contact of the dry ice pellets with the surface of the workpiece results in a sudden refrigeration of the coating or contamination that is to be removed. That results in the occurrence of tension because of the different thermal expansion coefficient between contamination layer and work piece. The layer of contamination develops micro cracks and so contributes to the effectivity of the next two effects.



The kinetic effect: the momentum of impact

The kinetic energy being released by the impact of the dry ice particles on the work piece deforms and chops the particles. Like that they can enter deeply into the cracks that have formed due to the cooling.



The phase transformation effect: the blasting power of sublimating dry ice

After deeply permeating the contamination layer, the dry ice immediately heats up and gasifies. During this process of the sublimation of dry ice its volume increases by more than 700 times. The contamination layer bursts through the force of this expansion. The surface itself however remains unharmed.

ONE PROCEDURE. MANY ADVANTAGES.

The assignment of dry ice blasting systems is especially useful where alternatives such as sand blasting or water blasting result in unnecessary disadvantages. Using the dry ice blasting procedure no there is no effort in getting rid of blasting agents. Because dry ice just recedes back to its gas form, this procedure just leaves behind the dirt that has been cleaned off the specific surface. Depending on each case of application the remains can be vacuumed off, be swept up or simply washed away.

This characteristic predestines dry ice blasting for the restoration of old timers, the cleaning of air condensers in power plants, the template cleaning of metal casting products, the cleansing of industrial tanks and much more. A selection of the most common application fields can be found on the following pages.

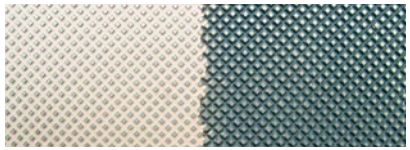
3W

Where? What? When?

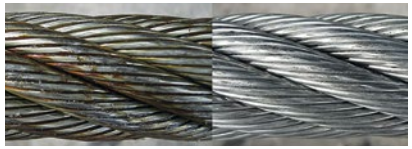
Dry ice blasting is used in many branches. It is utilized in a number of production procedures such as aeronautical engineering, military engineering, restoration, printing process and many more. Theses images show five examples of before and after comparisons. All work pieces have been blasted with White Lion systems.

With growing renown new applications are constantly found for the dry ice blasting technique. In a conversation with our service contractors and producers who have applied the procedure under many different circumstances over many years, you can find out if your idea can be realized with the dry ice blasting procedure. The best fundament for a realistic estimate though is a test blasting. For both White Lion is your competent counterpart.

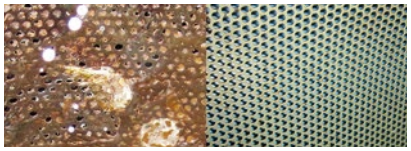
Especially objects with fine and complex surface structures can be ideally cleaned with the dry ice blasting procedure.



This image shows a grid roller before and after it has been cleared of natural rubber remains.

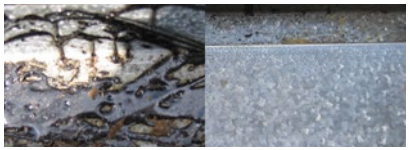


The cleaning of steel ropes with the dry ice blasting technique is easy no matter what the rope is utilized for. A high number of contaminations can be removed without damaging any part of the rope.

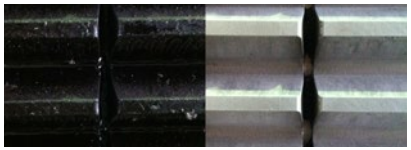


Industrial drying ovens and tunnel drying systems can be cleaned very efficiently with a dry ice blasting system. Condensates, plastic remains and saps are no obstacle for the dry ice blasting procedure.

This image shows a dust coat that developed on a greasy pipe. Whilst a cleaning with conventional agents is not only complex and inefficient but also creates uneconomical sewage the dry ice cleaning procedure simply lets dust and grease blast off.



Bituminous sheeting and flat roofs often have to be replaced after a fire damage. But how to cleanly separate the melted tar sheets from the roof? Bitumen reacts superbly to the refrigeration of the dry ice blasting procedure and basically flakes. The shim´s tin layer does not get removed.



This image shows the cogwheel engine of a barrel sorting machine before and after the cleaning by the White-Lion-WORKS-team. After the treatment the surfaces look absolutely like new. Contamination related errors or even outage time is being effectively prevented.

WL 3000 Profi

The dry ice blasting system WL 3000 Profi is the flagship model of White Lion. It is suitable for most use cases and convinces with its capability and solid processing as well as with some well developed design decisions that make dry ice blasting simply fun.

The model WL 3000 Profi is made of modern aluminum chassis and is therefore a lot lighter than many other dry ice blasting systems of the same capability level. An important characteristic especially for mobile service contractors. The high quality control panel comes with a progressively adjustable controller for the dry ice transport volume. The exact figure can be read off a digital display.

White Lion delivers model WL 3000 Profi together with a blasting pistol out of its own production, the White Lion Premium Ice Gun. Its simple design grants minimal error likelihood and maximum stability. The fiberglass reinforced casing is basically indestructible.

Furthermore the delivery package includes a blasting hose, a compressed air hose and a round nozzle so you can immediately start blasting. White Lion delivers the model WL 3000 Profi and gladly instructs you as to the safe and efficient use of the device.

The highlight of model WL 3000 Profi

- Comfortable changing of nozzles without tools
- Optional soft start function
- Internal air pressure regulation
- Smooth dry ice pellet transportation volume setting from 20 - 120 kg/h
- Digital display for the pellet transportation volume
- Acid resistant wheels with roller bearing
- Compressed air and blasting pressure manometer
- Personal delivery by the White-Lion-team including activation

WL 3000 IRON

Powerful.
Reliable.
Indestructible.

White Lion reacts to and detects the market´s wishes. With model WL 3000 Iron we have raised the established design of our WL 3000 Profi onto a new level. The highly robust premium steel chassis endures even the toughest conditions. Mechanical stress? Extreme heat? Model 3000 Iron stands like a tower of strength.

This evolutionary step in the WL model range is the outcome of intense analysis of our customer´s wishes. A push rod protects the blasting hose connection from collision damage. Wheels tighten the mobility on uneven ground. With a maximum 140 kg/h transportation volume White Lion adds yet another 20 kg/h pure blasting power.

Model WL 3000 Iron naturally also is delivered with a power round jet, a blasting and a compressed air hose. The White Lion team helps with the activation and the first steps regarding the dry ice blasting procedure.

Highlights of model WL 3000 Iron

- Massive premium steel chassis for highly challenging environments
- Comfortable changing of nozzle without tools
- Internal air pressure regulation 1-16 bar
- Smooth dry ice pellet transportation volume setting from 20 - 140 kg/h
- Digital display for the pellet transportation volume
- Emergency stop button with red LED signal light
- Personal delivery by the White-Lion-Team including activation

ALL DRY ICE BLASTING SYSTEMS AT A GLANCE

WL 1000 MiniMax

Small and compact

Lightweight, compact and still not to be underestimated. Model WL 1000 MiniMax is the product of close partnership with the form creating industry and is in constant service cleaning templates. For cleaning in foundries we include a fireproof blasting hose in our delivery. Because of its compact dimension the MiniMax is not only predestined for an easy transport on company grounds but also for mobile service contractors.

WL 1500 Competition

For beginners who want the best

Even with severe contamination model WL 1500 Competition allows an economical wastage rate with a dry ice pellet volume of up to 80 kg/h. Mobility and performance find their perfect synthesis. The smooth transportation volume controller grants precise navigation of blasting performance.

WL 3000 Profi

The allrounder

If you want to be geared up for any eventuality, model WL 3000 Profi is your system. The container has a comfortable volume of 30l and thus bisects the necessity of replenishments compared to model WL 1500 Competition. Naturally the Profi model also comes with a glass top for an easy checkup of the filling level.

WL 3000 Iron

The tower of strength

Our dry ice blasting system WL 3000 iron is the premium metal version of our established model WL 3000 Profi. The high dry ice pellet transportation volume of up to 140 kg/h makes it possible to have an economical removal rate of the contamination or coating that is to be removed.

WL 5000 AirMax

Powerful and convincing

During challenging constant usage there has to be enough ready-to-use dry ice at all times. With a capacity up to 50 kg the enormous container of model WL 5000 AirMax prevents all worries. And what about blasting power? 140 kg/h dry ice pellet transportation volume leave nothing to be desired.

WL 5000 Robby

Robot controlled

With dry ice blasting system WL 5000 Robby White Lion offers a solution for robot controlled dry ice blasting. It is the only automatized dry ice blasting system on the market that gives feedback on errors in the ice flow and so ensures maximum process control.

The device speaks all established robot languages and can immensely speed up production processes like surface pretreatment.

Model	WL 1000 MiniMax	WL 1500 Competition	WL 3000 Profi	WL 3000 Iron	WL 5000 AirMax	WL 5000 Robby	Model
Dry ice transportation volume	20-60 kg/h	20-80 kg/h	20-120 kg/h	20-140 kg/h	20-140 kg/h	20-140 kg/h	Dry ice transportation volume
Capacity of the container	10 l	15 l	30l	30 l	50 l	50 l	Capacity of the container
Weight	70 kg	75 kg	80 kg	110 kg	92 kg	92 kg	Weight
Automatable	No	No	No	No	No	Yes	Automatable

DEBURRING

The right method for the deburring of plastic- and metal party isn´t a trivial one to choose. Mechanical procedures like the removal of burrs by hand or glide grinding are established but still are pushing the envelop in some cases.

During glide grinding work pieces are mixed up with abrasive bodies and get ground by continuously being moved inside barrels or centrifuges. The procedure is easy to scale and thus makes demurring of huge quantities of work pieces possible in a quite short shrift of time. The outcome is a rather mat surface that is not always preferred. Furthermore the shape and geometry of the workpiece must allow the abrasive chips to reach every last part of their surface. Other than burrs and acute-angled joints the worst case can be spare abrasive bodies that need to be removed in yet a further work step.

Smooth and shiny surfaces can be obtained by removing burrs manually but that is expensive and time consuming. Moreover this process is limited by the simple fact that some surfaces can not be reached by hand.

That is where dry ice blasting proves its use and power. Because it is a non-abrasive procedure burrs can be removed without changing the surface´s state. Especially where the workpiece´s outside apparel matters within interior design elements or the automobile industry this is a crucial fact.

On top of that the dry ice blasting also bypasses a lot of the manual work´s limitations. If needed the dry ice jet can be focussed so precisely that it can permeate even the smallest gaps that are inaccessible to tools. Because the dry ice immediately transforms into its gas phase after touching the surface there are no leftovers of blasting media to be removed after deburring.

Dry ice blasting is especially useful if a new varnish is intended afterwards. The procedure not only removes burrs but also any kind of contamination and fingerprints. Or to say it in the words of White Lion: “The dry ice blasting procedure takes both tasks in one step: deburring and cleaning. That´s what makes this technology so superior.“

With dry ice blasting systems like White Lion WL 5000 Robby, the procedure is easily automated. One robot arm can drive the jet over the complete surface and control the blasting performance precisely and individually for each spot. Control of ice flow can be controlled at par and reported back to the operating system.

Together with its clients White Lion analyzes if dry ice blasting is suitable for their particular work piece. Functional tests and yearlong experience make up the fundament for a substantiated decision.

BARREL CLEANING

Quite often barrels and silos that are used for the storage of chemicals are being cleaned with water. Thereby the water mixes up with the removed chemical residue. If these are toxic or endangering to the environment the disposal of this contaminated water becomes a big effort.

With the dry ice blasting procedure this cleaning can be done much more efficiently. By blasting the barrel´s walls with dry ice the contaminations get a sudden cooling. Because of the different heat expansion coefficients of barrel wall and dirt the contaminations basically fall off the barrel.

Because dry ice immediately transforms from its solid to its gaseous state no blasting media gets left behind and no cleaning up of such is thus needed. Also the waste of hundreds of liters of drinking water is prevented. White Lion dry ice blasting systems can be equipped with arbitrary hose packets that make it possible to reach deep down into the tank.

For the security of your employees, special precautions need to be taken here. The person using the hose must implicitly wear a respiratory mask that is connected to an external oxygen supply to prevent a dangerous lack of oxygen. Because wearing a breathing mask is especially hard on the cardiac- and circulatory system, the employees should undergo a occupational health check following the policy of the trade association G 26.3.

Furthermore the cleaning of a silo or tank should never be done by one person only but always in team work. It is to be advised the blasting person is wearing a harness that is fixed to a hoist to make it possible for the person to be lifted out of the tank by a team partner if an accident (such as unconsciousness) should occur. In case of emergency the person using the hose can so be rescued without endangering another person´s life or wellbeing.

Especially during dry ice blasting it should be made sure there is a service hatch opened on the floor. Because carbon dioxide is heavier than air it otherwise would amass on the floor and possibly endanger the working person. When opened the carbon dioxide can easily leak out of the tank through the service hatch.

If you should be in need of a tank cleaning, you may contact White Lion. The service team of White Lion WORKS has already realized numerous tank cleanings and does not only bring along the needed equipment but also offers the required know-how to guarantee the safety of all participants.

DRY ICE BLASTING IN FOUNDRY

The foundry of the 21st century has access to technologies that only a few decades ago had been dreams of the future.The development of dry ice blasting surely is amongst the most intriguing techniques of this sector.

No aluminum foundry working with the coquille casting process can bypass the step of keeping the mold wetted with a separating agent to guarantee a simple removal of the casting piece from its mold. The problem: old and used separating agents have to be removed frequently.

The traditional cleaning of coquilles with high pressure water blasting or chemicals is possible but complex. Furthermore the contaminated water has to be disposed and treated. With dry ice blasting these problems can easily be circumvented.

Dry ice blasting systems clean surfaces with dry ice. The advantage: The blasting agent immediately sublimates and transforms into gas. Only the shock frosted separating agents have to be disposed of. But dry ice blasting is not only good to use with the coquille casting process but is also useful with model cleaning and sand casting process.

White Lion is cooperating with leading manufacturers of automated engineering to automate cleaning processes in foundries and ultimately reduce downtime to an absolute minimum. Core of these process solutions is dry ice cleaner model WL 5000 Robby that can be gated by all common robot systems and is giving fully automated feed back about the ice flow to the navigating system. Like this, molds can very quickly be pruned of residue and even be newly varnished.

DRY ICE BLASTING FOR WOOD RESTORATION

This is why restaurateurs more and more are banking on the dry ice blasting procedure. With accuracy firmer wood varieties can be lightened up using dry ice blasting without damaging it. Even if discoloration mostly does not pit construction material, it still is not nice to look at. Because pieces of a facade are variedly exposed to weather, their discoloration does also vary which results in unattractive spots and gradients.

There are many ways to brighten up wood. If you are dealing with historical construction material like beams in half-timber houses using sand blasting is not well advised. Sand blasting is an abrasive procedure which means not only is the surface getting cleaned but it also is partially being removed. After sandblasting beams of a half-timber house, their surface is destroyed and with it also historically valid construction informations.

That is why restaurateurs are banking on dry ice blasting. It brightens up firm woods without damaging them. Compressed air is shooting dry ice pellets onto the wood which is instantly freezing the dirt particles. The different thermal expansion coefficients of wood and dirt make sure that all substances seasoning on the wood are flaking off. Like this microorganisms and products of decomposition are being cleanly separated from the wood thanks to these physical effects.

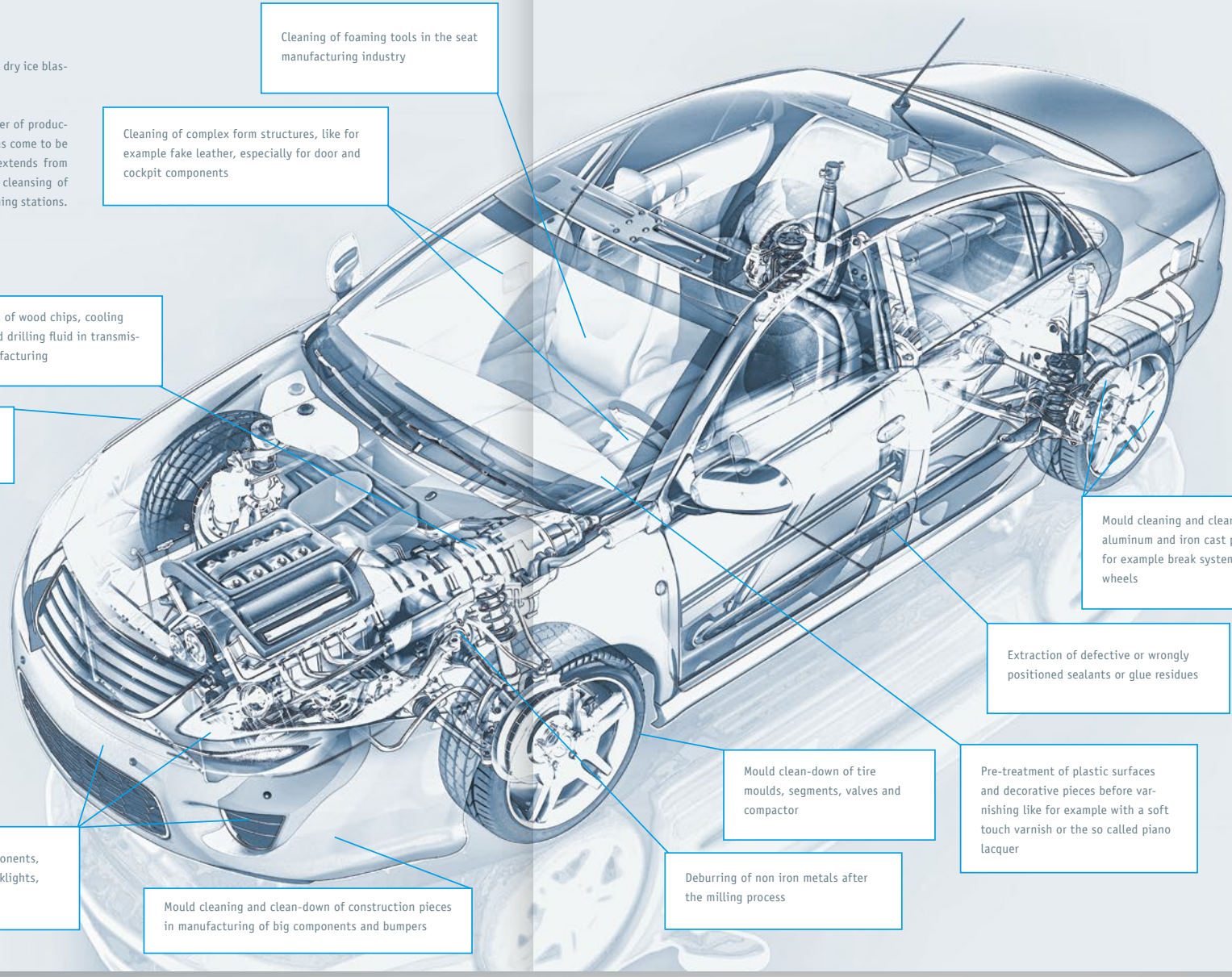
To prevent the process of discoloration to immediately start anew, it is recommended to varnish the wood with an appropriate protective. The varnish should be gapless so no water can get in between the wood and its protective coat. Best case scenario is a varnish that contains pigments to coat the wood from UV rays. Like this, a long lasting effect of the dry ice cleaning is guaranteed.

IN WHICH SECTIONS OF THE AUTO INDUSTRY IS DRY ICE BLASTING CALLED TO ACTION?

Automotive industry - the paragon

A branch that can not be imagined without dry ice blasting.

Modern cars originate out of a large number of production processes in which dry ice blasting has come to be a standard. The procedure´s application extends from surface cleaning to mold cleaning to the cleansing of assembly tools, body welding lines and joining stations. Daily applications are added to this list.



Cleaning of foaming tools in the seat manufacturing industry

Cleaning of complex form structures, like for example fake leather, especially for door and cockpit components

Extraction of wood chips, cooling agents and drilling fluid in transmission manufacturing

Cleaning of welding lines and joining stations in coach building

Deburring of plastic components, especially headlights, backlights, radiators and air inlets

Mould cleaning and clean-down of construction pieces in manufacturing of big components and bumpers

Deburring of non iron metals after the milling process

Mould clean-down of tire moulds, segments, valves and compactor

Pre-treatment of plastic surfaces and decorative pieces before varnishing like for example with a soft touch varnish or the so called piano lacquer

Extraction of defective or wrongly positioned sealants or glue residues

Mould cleaning and clean down of aluminum and iron cast parts, like for example break systems and alloy wheels

AUTOMATION

Dry ice blasting does not have to be a manual craft but also can easily be integrated in production workflow. That does not only reduce the production time and the production cost but with precise adjustment also increases the quality of surface cleaning.

The number of industries that can profit from automated dry ice cleaning is extremely high. There is for example the plastics industry that can deburr workpieces more effectively with complex geometry. The necessary movements of the robot are being taught once and after that can be utilized arbitrarily often with the same workpieces whilst maintaining their precision.

Foundries too can speed up their manufacturing with an automated cleaning solution. Not only whilst deburring metal pieces but especially when cleaning casting molds. Together with an automated solution for the application of new separating agents production, downtime can been radically minimized.

To get the maximum out of an automated dry ice blasting system, a lot of advice and expertise is needed. Is the automation profitable? What circumstances is the upgrade tied to? How to calibrate the blasting process? Does my production environment provide the needed infrastructure? Interested production managers can come to White Lion with questions like this. White Lion is offering an all round solution with its model WL 5000 Robby. It offers an automated dry ice blasting solution and integrates it with service and advise based on decades of experience.

Model WL 5000 Robby can be fully automatized after the users wishes. Parameters like blasting pressure and dry ice volume can be navigated in all common robot languages.

The unique characteristic of this model is ice flow control:
s e n s o r s
can feedback the robot system if no ice is leaving the nozzle any more so the personnel can immediately be informed about the error. That enables more work power that otherwise would have to be used for the control of the blasting system.

If the system is supposed to work even more autonomically, White Lion is offering a system with an integrated pelletizer, the WL 5000 Robby Plus. The dry ice production is here taking place inside of the system itself. No manual refilling of dry ice pellets is needed.

The level of autonomy is in the hands of the customer. White Lion is always by your side to find the most profitable balance.

DRY ICE CLEANING IN OLDTIMER RESTORATION

The restoration of old timers is a craft that does not only require passion but also experience and the right equipment. A dry ice blasting system by White Lion can be of help in various and numerous steps of restoration: if it is used correctly! There is a lot to be aware of when it comes to dry ice cleaning of old-timers. We will introduce some scenarios where a dry ice blasting system can be smartly used.

Before blasting: tape ventilation slits shut

During the dry ice blasting procedure dry ice pellets are shot until workpiece with high speed. The dirt particles that have been flaked off, can be swirled during the still ongoing blasting process and end up in places where they don't belong. Before the clean down of a car, ventilation and door slits should be taped shut with foil. Air tunnels can be plugged with paper. Like this dirt of the engine compartment or the underbody cannot get into the inside of the car. That prevents expensive damage of seat covers and valves.

Engine cleaning

When cleaning the engine of the car outside cleaning and inside cleaning are to be distinguished. When cleaning the outside of the car mainly old contaminations like old varnish are to be removed. This task can be finished extraordinarily well with dry ice cleaning. Because that is a nonabrasive procedure, the car is to keep its patina that it earned throughout its history. History and perfect cleanliness of the engine are not contradictory thanks to the dry ice cleaning procedure. During an overhaul the car's engine might also be dissembled. Like that, the mechanical components on the inside of the engine can be cleaned. During this cleaning of the engine´s inside combustion chamber, camshafts, cylinder and outlets are being liberated of grime and carbon.

Cleaning of the underside

The underside or underbody of older cars is usually coated in bitumen and glueing agents.
Often the restorer wishes to renew the underbody´s damaged coating. However it is not to be advised to overcoat the old underside varnishing because that will lead to problems with adhesion.

Instead the old coating of the underbody should be thoroughly removed with a dry ice blasting system before applying any kind of new varnish or coating.

For this purpose the dry ice blasting procedure is using the differing thermal expansion coefficients of underside protection coat (bitumen) and underbody (steel).

Both are abruptly cooled down to -78 degree celsius. But because both their volume is changing at a different pace there are frictions that lead to the flaking of the bitumen. The larger the difference in temperature during this cold shock the more effective the procedure.

That is why dry ice cleaning of underbodies is more effective during summer time than winter time.

Cleaning the inside of the auto

When a car is stripped down to its components there is always glue residue to be found after the removal of carpets, cockpit and headlining. These residues are not only unattractive but also definitively have to be removed to make new carpeting and headlining stick. Dry ice cleaning offers an elegant solution: the jet of the dry ice system is directly pointed onto the residue so that those flake off completely. Onto the now clean surface new adhesive can now be applied.

Refresh your Production

Stagnation in production is costly and to be avoided. An early recognition of damage in relevant system components is a precondition to guarantee safety and reliability of any production system. On dirty construction components excessive stress can seldomly be recognized.

But often wear-down on machines is looming ahead way before an actual incident. Possible reasons for an error can be friction, wrong adjustments, brittle mechanical construction components or the simple lack of lubricants in the right place. On a machine cleaned with dry ice, critical condition can be detected while the machine is still working: a crucial competition advantage. Dry ice cleaning is definitely a crucial part of modern production without which that production is hardly imaginable.

Dry ice cleaning´s big advantage consists of it being without residue and so can be exercised without stopping workflow. Advantages of dry ice cleaning at a glance:

- Enhancement and optimal exploitation of the lifespan of machines and systems
- Improvement of operating safety
- Enhancement of system availability and production
- Optimization of work flow and reducing of errors
- Predictive planning of costs

Interview with Swen Müller, founder of White Lion

Question: The company name „White Lion“ is quite unusual for your branch. what does White Lion exactly stand for?

Hr. Müller: On one hand „White“, meaning the color, white is a symbol for clean and pure surfaces. The blasting agent dry ice also is white. It does suit well, does it not?
„Lion“, the animal, represents the power behind the dry ice blasting and laser blasting procedure. If you want to clean powerfully you automatically come to White Lion.

Question: What are your goals for the future?

Hr. Müller: That´s simple! Expansion paired with innovation.

Question: How do you want to achieve that goal?

Hr. Müller: Germany is not the only place with a big sector for dry ice blasting. In fact that sector expands over Europe and around the globe.

That is what we´re aiming at. The first step into that direction we have already made. In Germany we currently are one of the most important providers of dry ice blasting systems. The reason surely being that for us the customer always comes first and we never lose sight of that, as mundane as that sounds. We want to expand more and more without letting go of this ideal.

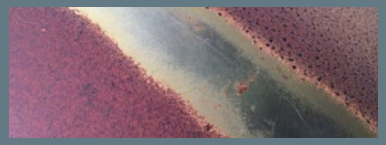
Question: With „White Lion“ how does that look exactly? Can you offer us an example?

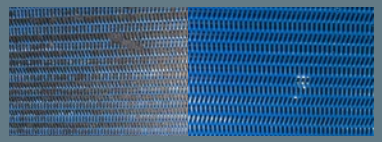
Hr. Müller: Before selling a machine, for example into a production we always try to get an exact profile of the task our customer is facing. The first solution coming into one's mind is not necessarily the best. You can clean your production line with every stagnation but maybe it is more profitable when a fully automatized dry ice cleaning system is keeping the production line Queen online. In past times we have collected a lot of expertise that helps us analyzing a large variety of situations. And because we always have an open ear for our customers we are constantly learning more.

WHITE LION WORKS

the professional cleaning-team

BEFORE AND AFTER





If the dry ice blasting technique is only needed once a year or less, it might be best to book an external service contractor. Especially beneficial it is if the cleaning team is working with machines out of their own production and can look back on to decades of experience in all manner of things concerning dry ice blasting. That means: sovereign handling of cleaning equipment, excellent service and supply of replacements: 100 percent stand-by duty.

That is why White Lion has its own service contractor section: the White-Lion-WORKS-Team. If a customer needs help by a team, a personal conversation comes first. If the customer is already familiar with the dry ice blasting procedure, and knows what he needs, nothing is in the way of even last minute service. If components of the task are unclear like for example, the cleaning capability or the needed effort, White Lion helps with ample consulting to create the needed planning security, if needed on site.

The cleaning experts of the WORKS-team, operating all over Europe, will then come to you equipped with the right tools to clean down any contaminations. If on-site there is no efficient compressed air supply (6 Bar, 6m³) White Lion will bring their in-house compressor by KAESER, a long time partner company of White Lion.

The WORKS-team is also offering interior cleaning of tanks and silos. All members of the team have had an occupational health check proving they are fit for wearing the obligatory oxygen masks. Furthermore the WORKS-team has the necessary security equipment available to guarantee that operations like this are happening with the utmost safety.

Our mission–
perfectly clean surfaces

THE LASER CLEANING PROCEDURE

A patented laser online cleaning system in paper manufacturing processes

Continuously clean dryer-fabrics/ fabric panels with an evenly high cfm-figure are an important part of modern paper production.

White Lion is well aware of the worries of paper manufacturers: an online system has to be reliable and highly efficient - not only concerning the cleaning results but also concerning the process costs.

The invisible clean down: growth in the paper industry

A condition for a trouble free paper production are clean dryer fabrics. White-Lion-CEO Swen Müller has focused on that very subject for many years. Dry ice cleaning does indeed get you good cleaning results on dryer fabrics, it can however just be used during downtime. How could an online system look that is reliable, efficient and can work during varying production speed?

White Lion´s answer is an online laser system. Stickies, fibers and other contaminations are being registered by a laser beam and eliminated. A precise suggestion is guaranteeing that the laser beam is only joining with the contaminations and thus can not damage the dryer fabrics. This procedure by the way is working completely without touch and without sound. As if by magic the machine just stays clean.

Compared to standard blasting procedures, laser cleaning does not only show its advantages in the possibility of online operation. It is also tied into independent feedstock. Because the laser beam is working with precision that is the exact up to the millimeter, the invested energy can be used to its maximum cleaning effect. The operating costs stay low and the cdm-figure remains high.

PROBLEM CASE: RUNWAY

The special characteristics of laser cleaning do however not only find usage in the paper industry. There is a laser cleaning solution for a very common problem in aviation and that is the contamination of the touchdown zone.

At all airports during landings of planes, there is intense rubber abrasion happening during touchdown. The heavier the landing plane and the more frequently planes are landing, the faster there is a rubber coat building on the runway jeopardizing flight safety. A rubber coated runway immensely extends the breaking time especially when wet (standing water), snowy or slushy conditions exists. If there is a continuous rubber layer on top of the runway the draining of the water through grooves (grooving), is made difficult. In this scenario the airplane´s tires do almost not make contact with the runway´s concrete anymore, which might very well lead to „hydroplaning" during which water between tires and runway make the plane´s proper steering impossible. A particular danger is the so called „viscose hydroplaning" which happens when the runway is especially contaminated, and is carrying a thin layer of water so that the plane´s steering is thoroughly made impossible. This is a common factor in accidents during touchdown and „runway overshoots".

That is why runways and especially the so-called „ touchdown zone" meaning the first 900 m of the runway must be cleaned regularly and thoroughly. Nowadays common cleaning procedure for runways is high-pressure water blasting. Rotating high-pressure jets are getting rid of rubber abrasion. Excess water and flakes of rubber particles are being sucked up into a vehicle and have to be disposed of. The water jet is also not only making contact with the contaminations, but is also shooting onto the surface of the runway so that possible damage can occur.

This overall approach is:

- Costly
- Tied to weather conditions
- Abrasive to the runway coating
- Takes up a lot of time
- Causes expenses for the disposal of rubber waste

CLEANING WITH THE

LASER BLASTING PROCEDURE

To solve these problems White Lion developed a laser blasting system that can be installed in cleaning vehicles. A laser beam shooting out of the underbody of the vehicle touches the runway coating of the touchdown zone. The frequency of the laser however is making sure that the laser beam is only affecting the rubber coating that is to be removed. This happens as the laser beam is burning up the contamination upon contact. The occurring waste gases are immediately sucked up by a vacuuming system and neutralized by a catalyst. The difference in thickness of the coating are being measured before and after the cleaning process by an ultrasound system and the results are being protocoled. Like that the process success is always transparent for quality control.

The operating cost of a laser system is significantly lower then with the common water cleaning procedure. A weekly or even daily use is possible and even to be aimed at to evenly keep the runway surface clean to a high-level. And so the best possible traction is guaranteed at all times and can contribute to aviation safety.

- laser system for the removal of rubber abrasion
- ultrasound systems for measuring layer thickness before and after removal
- vacuuming system for the sucking up of residue and filtering of waste gases
- Computer system for archiving cleaning data

The patent to this innovative procedure is held by White Lion. You are welcome to contact us.

SERVICE

What to do if the dry ice blasting system fails? No service contractor is interested in letting their customers wait and no producer wants to risk downtime. So this question might very well have come up with many users of the dry ice blasting procedure.

As a customer of White Lion, you do not have to ask yourself that question any longer. Because in case of failure, White Lion is providing a replacement system for the time of the repair work. How does this particular service proceed with White Lion?

1. If you determine a defect on your dry ice blasting system you can call our offices on weekdays from 8 AM to 4 PM, dialing the following number: +49 6151 359 4080. Our partner haulage will visit you within 24 hours. If needed they will pick up you're dry ice system and provide you with a replacement. We make sure that your dry ice blasting system is transferred intact.

2. The technicians from our workshop are taking a close look at your system and will contact you to inform you about the expected time of repair. Depending on the damage and if there are replacement components on-site, repairing time can take between a few hours and one week.

3. If your system can be repaired, we will instantly fix it and bring it back to you. You do not have to be concerned about the replacement system either, we are taking care of that, too.

4. Your machine is in top condition and you did not have the trouble of waiting customers during repair. Even if we might have come to see that your system has reached the end of its lifespan, you may keep a replacement system until you have decided on a new one. In a situation like this we are also by your side and are providing consultation and advice.

MOST IMPORTANT SUPPLIES

White Lion flat nozzle

Large surfaces like for example facades are usually cleaned with flat nozzles. Because of the wide outlet a satisfyingly large section can be cleaned time efficiently. It is understood: the smaller the outlet the larger the kinetic energy of the impinging pellets. Concluding that flat nozzles are especially suitable if the surface is large, the contamination however only moderate.

White Lion round nozzles

Usually round nozzles generate the highest aggression in combination with the dry ice blasting procedure. These nozzles are compact and versatile. The same rule applies where consistent compressed air and quantity performance are controlled by the size of the outlet of the nozzle. The smaller the outlet the larger the kinetic energy of the impinging pellets.

White Lion Multi Ice Gun

Dry ice blasting pistols are exposed to vast exertion in everyday work. The fiberglass reinforced White Lion Multi Ice Gun is therefore manufactured with special focus on sturdiness. It is pressure and heat-proof and also highly resistant to weather and strikes.

White Lion Premium Ice Gun

With the Premium Ice Gun, White Lion combines all forces of the Multi Ice Gun for the needs of our professional long-time users. The ergonomic trigger is retrofittable and can be operated with the whole hand. A breaker makes it possible to switch between two modes of operation: dry ice blasting and pure compressed air.

Dry ice scrambler

A dry ice scrambler smashes the dry ice pellets before they leave the nozzle and so creates micro particles that can infiltrate all corners and rills.

Hose bundle

The hose connects the dry ice blasting system to the blasting pistol. White Lion offers hoses from a length of 5m, 7,5m and 10m. The quality premium steel coupling system prevents the warping of the hose.

Protective cover

The washable protective cover prevents contamination and damage of the dry ice blasting systems. Supplies can be stored in the side pockets of the case. A plastic window over the navigation elements enables control over the operating conditions.

LUMI-package

The LUMI-package is that suitable headlight for the White Lion Multi Ice Gun. With the LUMI-package a precise blasting is possible even in a dark environment. The lights can be run with batteries or mains supply.

Good to know...
For more information please read our technical catalogue.

Compressed air – nothing can come from nothing

Compressed air as an operation warrantor

Without compressed air now dry ice blasting procedure. In environments without a compressed air supply White Lion helps out with a suitable compressed air system. In close partnership with KAESER we distribute the mobile construction compressor MOBILAIR in all sizes.

KAESER is a German manufacturer of solutions for the supply of production and work procedures with compressed air. The solutions of KAESER reach from the generating of compressed air, its processing and distribution. Optimal efficiency is the focus here.

Modern mobile construction compressor supposed to supply compressed air reliably, efficiently and quietly. The MOBILAIR-line´s compressors are not only doing well in all of these three disciplines but also offer the benefits for further uses. With its 9,7 or 11,5 m³/ min of effective quantity delivered under 7 bar the construction compressors of KAESER are mostly one thing: powerhouses for dry ice blasting. White Lion knows from experience that KAESER systems are a great choice for dry ice blasting. The White-Lion-WORKS-Team is working with one of KAESER´s compressors and with it has already successfully completed numerous cleaning services.

White Lion is partner for the complete KAESER portfolio´s distribution of stationary electric compressed air supply and of its mobile fleet.

IT`S COOL

Even more services by Rippert

The company „Rippert Anlagentechnik" (plant engineering) from Herzebrock-Clarholz has made its mark with all round solutions for varnishing and treatment of surfaces. To, for example, cleanse work pieces of fingerprints and other contaminations Rippert has been banking on White Lion´s dry ice systems for a long time now.

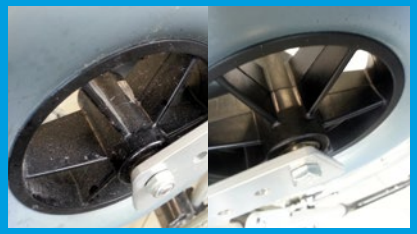
So it was only logical to merge expertise to broaden the company´s spectrum. That is why now Rippert is offering a cleaning service all over Europe. Thorsten Becker is leading the new service division. He knows what advantages clean plants mean for producers of all branches: less downtime, better security and better efficiency: simply higher quality.

With the service vehicle by Rippert the dry ice blasting system WL 3000 Profi is traveling from customer to customer and is warrantor for clean plants (transportation engineering and varnishing cabins) and contended production managers.

DRY ICE CLEANING IN MEDICAL ENGINEERING

Provita arndt is a company from Neustrelitz that offers versatile services in medical engineering. Its clientele extends over medical practices over nursing service up to hospitals. Th goal of provita arndt is to analyze and supply the right technology for each individual patient. It is self-evident that hygiene counts highly with provita arndt. The thorough cleaning of wheelchairs and beds returning from duty is quite a task with all the grooves and corners in which dirt can deposit. The amount of time needed for a manual cleaning was not welcome with provita arndt. On their search for possibilities to speed up the cleaning process without compromising quality the company approached White Lion. Today dry ice blasting system WL 3000 Profi is part of provita arndt´s standard supply. „Before we had the dry ice blasting system, the cleaning of a bed took 45 minutes." Stefan Lütcke, manager of sales at provita arndt is telling us, „ now it only takes half of that anymore."After the cleaning the team manually disinfects the bed and then can forward it to the next patient. These pictures show part of a wheelchair before and after the cleaning with a WL 3000 Profi. A Dry ice scrambler smashes the dry ice pellets, generates micro particles before they leave the nozzle so that those particles can deeply invade complex surfaces, corners and rills. The sublimation of the dry ice explodes the dirt off the surface and makes a manual and involved cleaning obsolete. „The system is now in everyday use with us since over a year ago.", Lütcke tells us. Apparently the investment is paying off.

„We are surprised with what great ideas customers continue to approach us.". Swen Müller of White Lion says. Since the partner work with provita arndt he is convinced of the benefits the dry ice blasting procedure can also offer to medical engineering service contractors.



DRY ICE

Dry ice (frozen carbon dioxide) it's a real all-rounder. With its special characteristic not to melt when being heated but to instantly transform into a gas it guarantees extremely low temperatures with at the same time no moistness at all. From the cooling of groceries to the dry ice blasting in industrial cleaning: this unique feature is appreciated in numerous branches.

The generating of dry ice follows the relaxation of carbon dioxide that has been liquified under pressure. Similar to fire extinguishers, part of the carbon dioxide vaporizes so the accompanying heat deprivation is cooling the remaining carbon dioxide. Carbonated snow originates and can be used for forming dry ice blocks, -pellets or -nuggets.

As opposed to water ice, frozen carbon dioxide has many advantages in grocery refrigeration. When sufficiently isolated in a thermal box the low temperatures of under -78°C allow long-term freshness of perishable groceries and thus is also suitable for shipping. The characteristic dry ice mist that generates during air contact of dry ice is a classic in the show industry. But especially dry ice is perfectly suited for the uncompromised cleaning of surfaces in almost all contamination cases.
Dry ice can be acquired from White Lion at a fixed price. Shipping, packaging and transport boxes are inclusive. No matter if dry ice pellets (3mm) or -nuggets (16mm): White Lion is shipping all over Germany. Customers located in Rhein-Main and Rhein-Neckar are being supplied personally by White Lion from an order over 100 kg on.

ADVANTAGES OF DRY ICE SELF-PRODUCTION

If dry ice is needed on short-term or regularly in large quantities, the on-site production of dry ice makes sense. With your own dry ice machine you can secure the supply of high-quality dry ice. At the right time, the right place and the desired quantity.

During transport of dry ice over long distances, loss due to sublimation is inevitable. During storage and transport dry ice is not only losing weight but also quality due to condensation of environment moisture and icing up on the surface. Contrary to that, liquid carbon dioxide can be stored without loss for an on-site production.

On-site dry ice production with the pelletizer White Lion Arctic

„White Lion Arctic" is a compactor for the manufacturing of dry ice pellets. The changeable matrix enables pellet sizes between 3,10 and 16 mm. The production performance is about 120 kg/h with pellets of the size of 3 mm.

THIS IS WHY DRY ICE BLASTING WITH WHITE LION IS SO SUPERIOR

1. Outstanding cleanliness!
Sensational cleaning results, short cleaning cycles!

2. Online cleaning!
Plants and machines can be cleaned with dry ice on-site. Meaning no complicated dismantling is needed and productivity of your company is increased!

3. Time is money!
Dry ice cleaning is quick and effective. This results in higher service life!

4. Surface protecting, nonabrasive, not flammable and electrically nonconducting!
A Dry ice cleaning with White Lion blasting systems is extremely gentle and can even be used with electric components!

5. Prevention of subsidiary waste!
During the cleaning process dry ice instantly evaporates, not leaving contaminated blasting agents like water or granulite behind. That is an important aspect regarding the economical efficiency of dry ice cleaning.

6. The dry ice jet is everywhere!
Compared to conventional industrial cleaning the dry ice jet of White Lion´s systems reaches almost every last spot in plants, machines and construction components.

7. It´s environment friendly and protecting resources!
The green thought - the green mind - is inclusive with every dry cleaning! The dry ice blasting procedure fulfills the guidelines of USDA, FDA and EPA.

8. User safety and work protection!
Your employees are not exposed to toxic vapors of chemicals or solvents working with White-Lion-dry-ice-blasting-systems.

9. User efficient!
The dry ice technology of White Lion is timesaving, simple, quick and effective!

10. Yes, in the food industry!
! The dry ice blasting procedure is approved for the food industry. Carbon dioxide is food-safe! White Lion is offering strong, thorough and quick cleaning procedure for all industrial industries on this planet.

IMPRINT

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WHITE LION

Dry Ice & Laser Cleaning Technology

Made with passion.

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