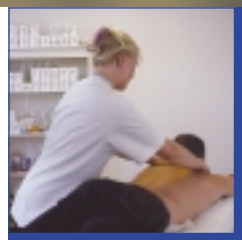


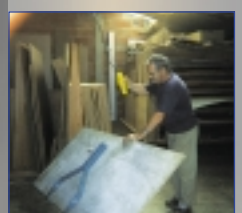
Preventisme

Practical prevention of accidents in SMEs

www.preventisme.org

A project by UEAPME

Good Practices



UEAPME European Association of Craft, Trades & SMEs

With the support of the European Agency for Health and Safety at Work

A project carried out by UEAPME (European Association of Craft, Trades and SMEs) together with PREVENT, Institute for occupational safety and health, and the following member organisations of UEAPME:

CAPEB	Confédération de l'Artisanat et des Petites Entreprises du Bâtiment (Confederation of Craft, Trades and SMEs in the Construction Sector) (F)
CEPEC	Confédération Européenne Professionnelle des Esthéticiennes Cosméticiennes (European Confederation of Beauticians) (EU)
CONFARTIGIANATO	Confederazione Generale Italiana dell'Artigianato (I)
FPB	The Forum of Private Business (UK)
PIMEC SEFES	Petita i Mitjana Empresa de Catalunya (SMEs of Catalonia) (SP)
UNIZO	Unie van Zelfstandige Ondernemers (Association of Self-Employed Entrepreneurs) (B)
WKÖ	Wirtschaftskammer Österreich (Austrian Chamber of Commerce) (A)

A publication by the European Association of Craft, Trades and SMEs (UEAPME)

Project Leader: Liliane Volozinskis, UEAPME
Experts: Veronique De Broeck and Bénédicte Godfraind, PREVENT

This document is published in 4 languages (French, English, German, Italian).
It is also available on the Web at: www.preventisme.org

Printed in Belgium, September 2002

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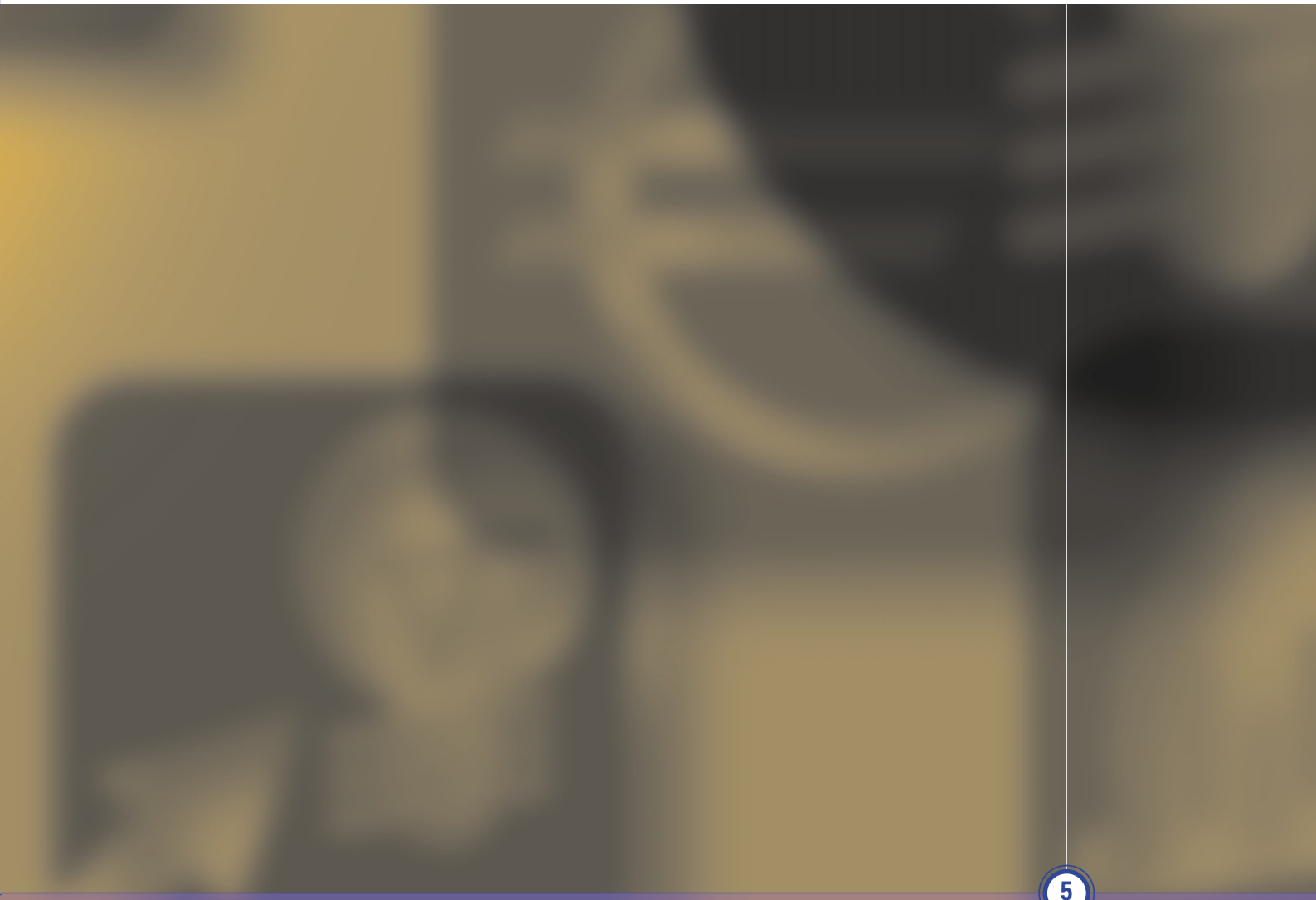


FOREWORD

The active participation of UEAPME in the 2001 programme for the prevention of industrial accidents in SMEs - run by the European Agency for Industrial Health and Safety - together with the "Preventisme - prevention of accidents in SMEs" project is highly significant.

UEAPME, the employers' organisation representing the interests of Craft Trades and SMEs in the European Union and candidate countries at European level, now has 65 member organisations amalgamating inter-sectoral national federations and European sectoral federations. UEAPME represents 7 million of the 19 million firms in the European Union. These 7 million employ a total of 30 million people.
Our objective is to provide a real support to our SMEs in their numerous and varied responsibilities and obligations, particularly in the field of health and safety.
This figure of 30 million employees in itself calls for a genuine commitment to promoting industrial health and safety.

The aim of our involvement is to show that SMEs and Craft Trades are taking effective action in the field of industrial health and safety. They demonstrate this not only by complying with current legislation, but also through their concern with regard to preventing industrial accidents and diseases for the people they employ. They also have simple but astute ideas in relation to implementing accident prevention measures and put a lot of energy into searching for effective and cooperative solutions.

Ensuring a working environment that is safe and healthy within the firm is simply a matter of survival for Europe's small enterprises, which employ an average of 3 to 4 workers and for whom each worker is precious. Small enterprises have an ethic which is based, above all, on human values, which means that a worker is regarded less as a mere productivity factor but rather as a human being with his/her own personal and family background and his/her potential know-how, competence and creativity. This is why SMEs must prevent accidents and avert work-related risks.

Nowadays, SMEs are firmly convinced that a safe and healthy working environment is a factor that has a bearing on the firm's economic performance.
Although it is a major element in the smooth operation of the firm, it must not be used as a pretext for excessive regulation. The real challenge confronting us today lies more in correct and effective application of all the existing legislation and in the prevention of risks rather than in drawing up new legislation.
This prevention culture must be based on a partnership between all the players involved and must be accompanied by substantial efforts in the areas of information, training and enhancing awareness.

Although the prevention of work-related risks does certainly falls within the competence of the employer, a prevention policy cannot have convincing results without specific involvement of the workers or without the support of advisory and professional bodies.
This is clearly shown in all the cases of good practices presented here.
This is all the more necessary in SMEs and, above all, in very small enterprises, given that they have to cope with specific constraints resulting, in particular, from their size.
Even though recent statistics show a constant reduction in the number of accidents at work, something that UEAPME warmly welcomes, we are all aware that the figures are still too high.
So we have to continue vigorously with our prevention endeavours both now and in the future.

The main task is to explore all the avenues that will enable us to reduce and prevent accidents. ***We consider the exchange of good practices to be one of the best ways of achieving this aim.***

This is also the reason for our decision to become involved in this 'Preventisme' project.
We knew that the enterprises we represent at European level were active in this field but, unfortunately, they seldom have the opportunity to communicate with each other and exchange views on what they are doing to improve matters in this area.

The purpose of our project is therefore:

- *to identify and gather good practices initiated by and implemented in small enterprises to prevent industrial accidents and diseases,*
- *to focus on the successful elements of these good practices,*
- *to disseminate these as widely as possible via an Internet website -* ***www. preventisme.org - and via this booklet,***
- *to facilitate exchanges and transfer to other enterprises and sectors or otherwise encourage other enterprises to reflect and develop their own solutions.*

The 'Preventisme' project has also demonstrated ***in specific terms*** *that small enterprises are:*

- *aware of the economic and social importance of the industrial health and safety factor,*
- *aware of the risks and able to assess them,*
- *able to implement appropriate and effective measures to prevent these risks,*
- *able to incorporate them into a global strategy,*
- *doing this within the framework of partnerships with external structures and, in particular, with their employees, directly involving them in the search for and elaboration of simple solutions that can be applied and adapted to the workplace.*

This is the philosophy of the company heads presenting good accident prevention practices in this booklet and also reflects our philosophy at UEAPME.

I hope and trust that the work accomplished under the 'Preventisme' project - drawing on the pedagogic quality of exchange at all levels - will result in real added value not only for a good many enterprises in the European Union, but also in the countries applying for accession to the European Union.

In conclusion, I would especially like to thank all the company heads that took part in this project, as well as the experts of our member organisations who assisted and supervised them. My most sincere thanks also go to the PREVENT team for their technical assistance and to the team of the UEAPME Secretariat, which devised, organised and coordinated the project.

Hans-Werner Müller
UEAPME Secretary-General

FOREWORD

PREVENT is especially delighted to be involved in a project organised by the European Union for Crafts, Trades and Small and Medium-Sized Entreprises. UEAPME is a powerful network which, thanks to a series of active member organisations, is in a position to raise awareness of prevention issues among businesses throughout Europe, and provide them with support tools. Preventisme is a model example of a simple but effective tool that is worthy of imitation.

PREVENT is acting as an expert in the Preventisme project. Its tasks include drawing up surveying and criteria documentation, evaluating good practice examples provided by participating businesses, designing the website and compiling the manual.

Its expertise is the fruit of knowledge and experience amassed over many years in the field of prevention in the workplace. PREVENT is a knowledge centre specialising in the prevention of occupational hazards, the promotion of quality of employment conditions, the improvement of work organisation and the extension of corporate policy regarding the environment. The institute provides support, offers advice and conducts study and research projects.

PREVENT has always been particularly aware of the individuality of smaller companies. These represent a significant element of the European economy. However, the driving force in an SME is its human capital. Even more than in a large company, the experience and competence of the personnel represent a vital factor. Protecting employees against occupational hazards and promoting their safety, health and well-being is thus much more than just a legal requirement: it is a way of investing in the company's human capital.

Moreover, investing in prevention usually has favourable financial consequences. After all, work accidents and time off work due to adverse working conditions cost companies large amounts of money in the form of pay, disrupted production schedules, the costs of finding replacements, administration and so on.

The PREVENT http://www.prevent.be work programme has a special section dedicated to raising awareness in small companies and providing them with support in devising a prevention policy. These activities include training programmes, information sessions, advice and the publication of practical brochures and other resources.

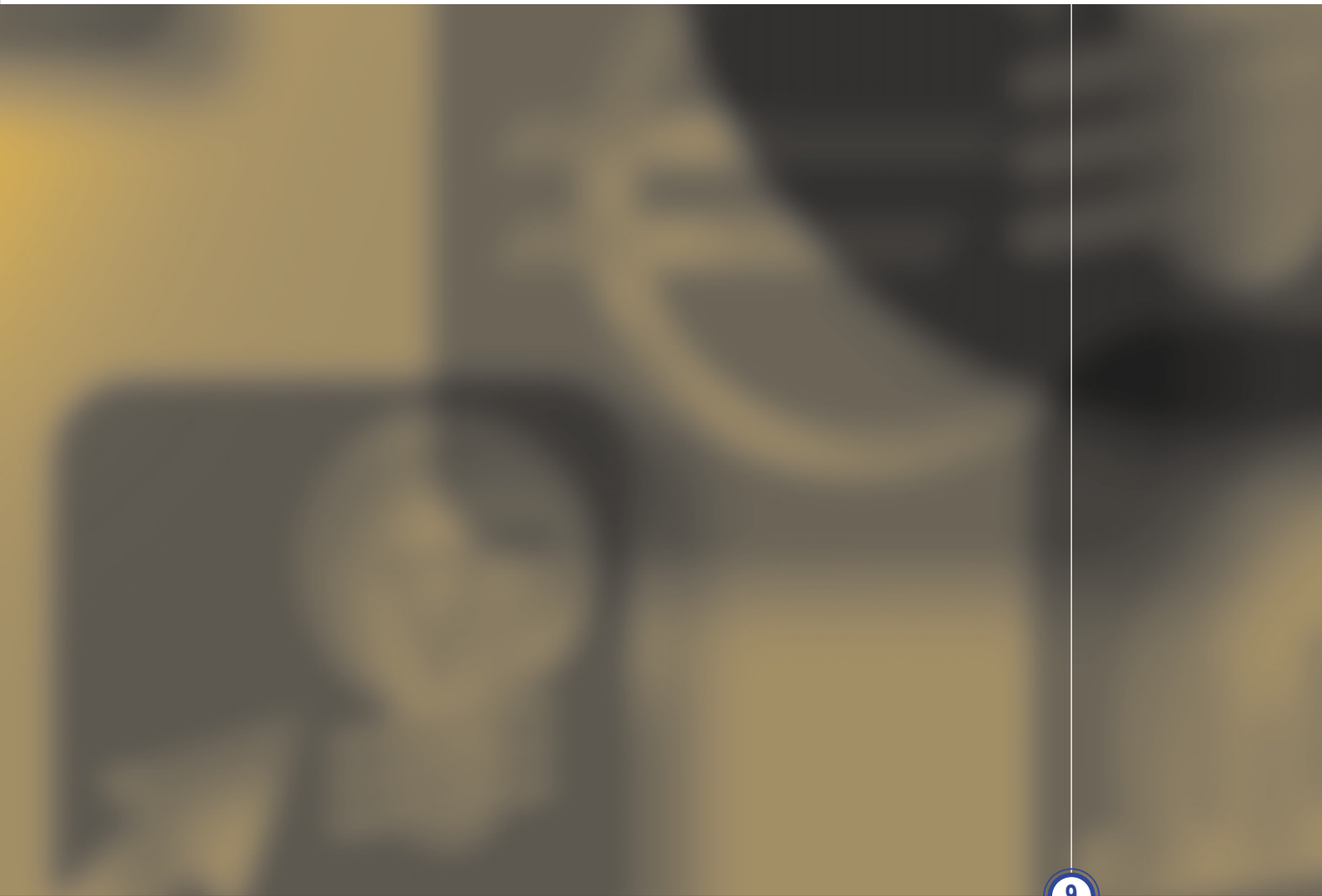
But even the best-designed products will not achieve their goal without the cooperation of organisations and structures which have direct access to small companies, crafts and trades.

PREVENT is continually seeking cooperation with these organisations and structures in order to launch joint initiatives. The institute has therefore taken the initiative of launching a wide-ranging campaign that focuses on networking and is primarily aimed at achieving structural results.

The main aim of the Pro-Safe campaign is to create a broad platform for the various activities relating to the safety, health and well-being of SME employees. This both generates economies of scale for the various organisations concerned, and will substantially improve the accessibility of the information for SMEs.
The campaign is supported by a website www.pro-safe.be, a leaflet and awards.

Marc De Greef
Director PREVENT

2. Introduction



European Agency
for Safety and Health
at Work

European Programme for the Prevention of Accidents in SMEs

The 'Preventisme' project is conceived within the framework of a programme run by the European Agency for Industrial Safety and Health (Bilbao) and devoted to accident prevention in SMEs.
This programme is but a preliminary step to a long-term programme designed to promote the development and exchange of genuine examples of good practices, with the aim of reducing the number and severity of industrial accidents in Europe.

Furthermore, this topic was selected for the European week of health and safety at work in 2001, during which various initiatives were launched under the motto "Success is no accident".

The aim of this programme is to participate in the elaboration, implementation and transfer of effective prevention measures including, in particular, risk assessment, systematic handling of accidents, workers' training, agreements based on social dialogue, information campaigns, etc.

These are the types of good practices that you can discover in this booklet.

For more information, please contact

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Fax: +34 944 79 43 83
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http://agency.osha.eu.int

Good practices

The 24 cases presented here come from seven European countries and all of them from small enterprises.

We learn, for example, how an Austrian printing works has decided to fight the risk of loss of hearing linked with the noise in the workshops; the solutions developed by French and Dutch beauty salons to counteract rheumatism and contamination risks; the actions taken by different French, Italian and Belgian joinery workshops to guard against risks of sawdust exposure, cuts and muscular/skeletal disorders; how a Spanish enterprise has introduced a solution thought up by one of its workers; or even the way that a health care centre has reacted to prevent risks of rheumatism in nursing auxiliaries.

In each case, the task, the risk, the solution and the methodology adopted, the workers' participation, the effectiveness of the solution implemented and the cost-benefit ratio are described.

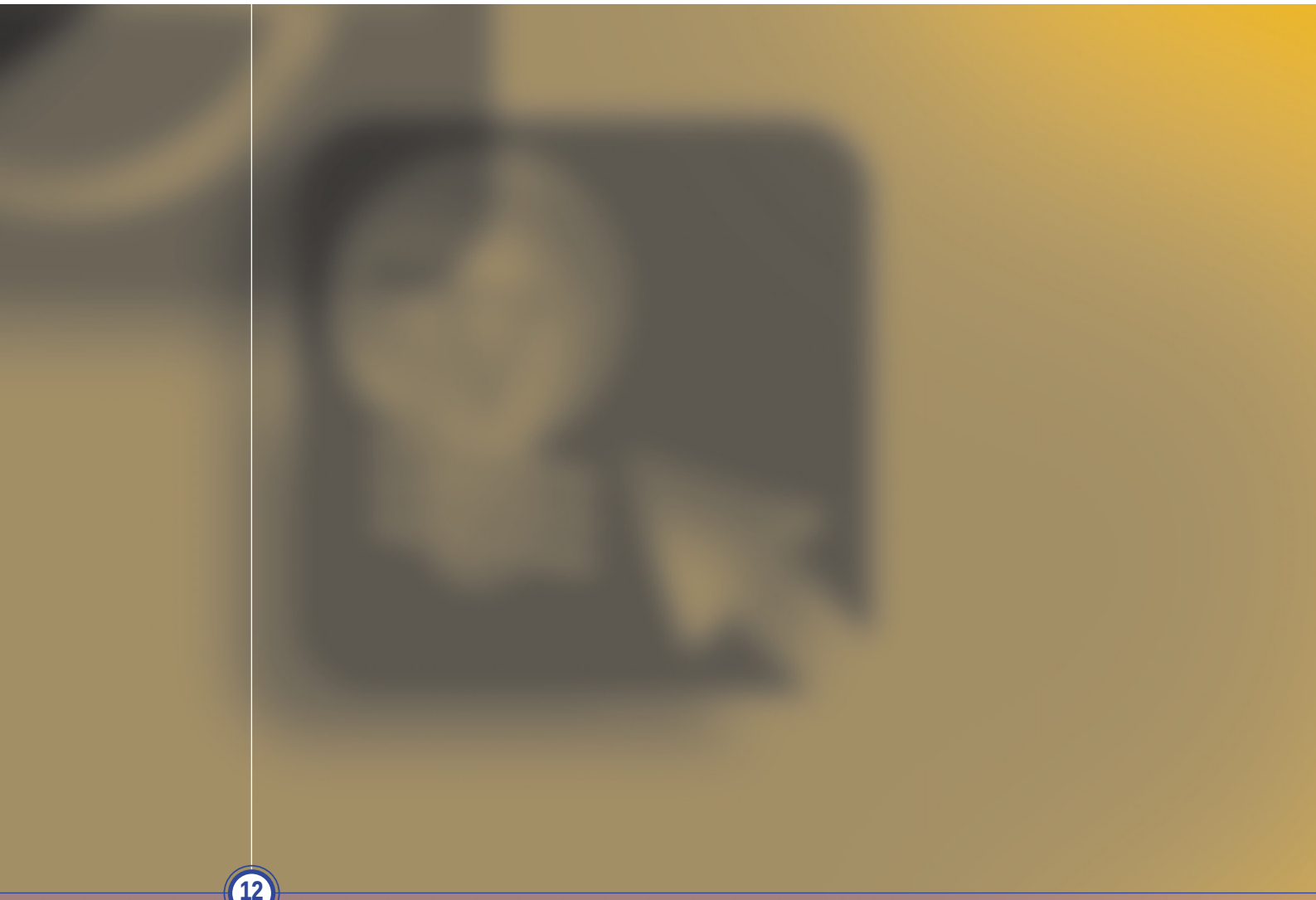
Some enterprises have developed the solutions themselves by calling on their own know-how, while others called in outside experts specialising in the field of risk assessment and analysis. However, most of these enterprises have involved their workers in defining the risks and searching for suitable solutions.

Although each enterprise is special in its own right, the types of risks are seldom unique and the solutions may be relevant and applicable to other enterprises or sectors.

These and other examples show that when it comes to safety and health, solutions are conceivable in small and medium-sized enterprises that are often simple and inexpensive.

The enterprises that have developed and implemented such solutions would like to share their experiences with you.

3. *Success factors in the field of safety and health in SMEs*



Success factors in the field of safety and health in SMEs

Measures adapted to the workplace are the key to success when it comes to preventing industrial accidents. Health and safety require a strong commitment from company management together with real involvement on the part of the workforce.

The examples of good practices presented in this booklet show how the combination of analysis, monitoring, research and creativity can make all the difference in bringing about tailored solutions to improve industrial safety and health.

The analysis of these examples has enabled experts in the project to establish a number of elements and success factors as well as to formulate recommendations for the prevention of industrial accidents in small enterprises.

Risk evaluation

In order to find ways of preventing accidents, it is necessary to know the causes. Conducting risk evaluation and analysis in the workplace is essential. The enterprise must carefully examine everything that could be a source of risk, including, for instance, the introduction of new working methods. It would, of course, not be desirable for the latter to subsequently give rise to new risks.

All the enterprises carried out a risk analysis before implementing their good practices.

• Work organization

Good work organisation is an important factor in improving industrial safety and health. Good organisational conditions indicate a real commitment on the part of the employers with regard to health and safety, including exemplary behaviour. Health and safety are part and parcel of the management of the company and the day-to-day business. The workers are deeply involved in the health and safety aspects of their jobs.

Furthermore, a structured approach to health and safety management facilitates evaluation of all the risks and ensures that work methods adhering to safety norms are introduced and applied. Periodic revision makes it possible to check whether these measures are still appropriate.

Management obligation

Company management must promote health and safety by:
- defining health and safety policy and objectives;
- providing the resources necessary to implement this policy,
- integrating health and safety into all operational levels under its responsibility,
- consulting the workers,
- monitoring and analysing the measures to verify the effectiveness of the policy and the system as a whole.

Involvement of workers

In all the case studies, the workers are generally (22 cases out of 24) involved in the process of elaborating and implementing the good practice to a considerable degree. They are the main players in developing the solution through consultation and risk assessment.

In some enterprises, the workers have themselves taken the initiative and cooperated with their employer in implementing the solution.

Consultation and involvement of the workforce appears to be crucial. Making use of their knowledge ensures that the risks are correctly identified and appropriate solutions implemented. The workers must be consulted on health and safety measures and when new technologies are introduced. Consultation helps to ensure that the workforce is involved in the procedures and improvements relating to industrial health and safety.

Sarl Mairel:

"The foreman and the workers concerned worked together with the boss to develop the solution"

Innaca:

"The good practice was conceived, elaborated and implemented by the workers, on their own initiative"

Enhancing awareness, information and prevention

In 17 of the 24 cases, there is evidence of explicit involvement on the part of management in integrating health and safety into the overall management of the company. Six other enterprises show average involvement by management. This means, among other things, that the employer informs his workers about risks and safe working methods and encourages them to develop more good practices. One of the enterprises has invested in industrial safety and health training for two of its workers.

Tintoreria Penalba:

"The owner of the company is, as a matter of principle, constantly observing the situation so as to improve the health and safety conditions in the workplace and be more competitive on the market"

Nicomax:

"If there is a lack of information and control, the risk of such an activity is that it can have serious knock-on effects"

• Skills and human behaviour

Skills and human behaviour are two of the determining factors when it comes to the success of the enterprise. Nowadays, enterprises invest in communication, motivation, participation, cooperation and creativity.

Communication

20 of the 24 enterprises are using new or improved forms of communication and cooperation. Some enterprises have developed a proactive stance in the field of safety. More than just preventing industrial accidents, they also promote the concept of safety. These enterprises go beyond strict observance of the legislation governing safety.

Dinamic Laser:

"This good practice is based to a great extent on the information provided by the workers about new risks that could arise from the company's operations. Obviously, this good practice could not have been achieved without the cooperation of everyone in making the preventive measures an integral part of the company's activities."

Innaca:

"Communication, cooperation, proactive behaviour. The prevention of risks has been implemented in the enterprise together with the quality control systems, calling for the participation of the entire workforce in taking the initiative at all levels"

Training

In more than half of the enterprises, the solution (good practice) has led to training activities mainly geared towards correct use of the new technique or new method.

Dinamic Laser:

"Training and information are the cornerstones for achieving this good practice"

Boscolo:

"It is crucial to train the entire workforce in order to implement and apply good practices. The training must take place within the enterprise and all the workers must see it as an element essential to the growth of the enterprise itself"

Nicomax:

"We have organised and continue to organise training courses to enable the workers to take care of their safety and health at work"

• Role of the supporting organisations and external services

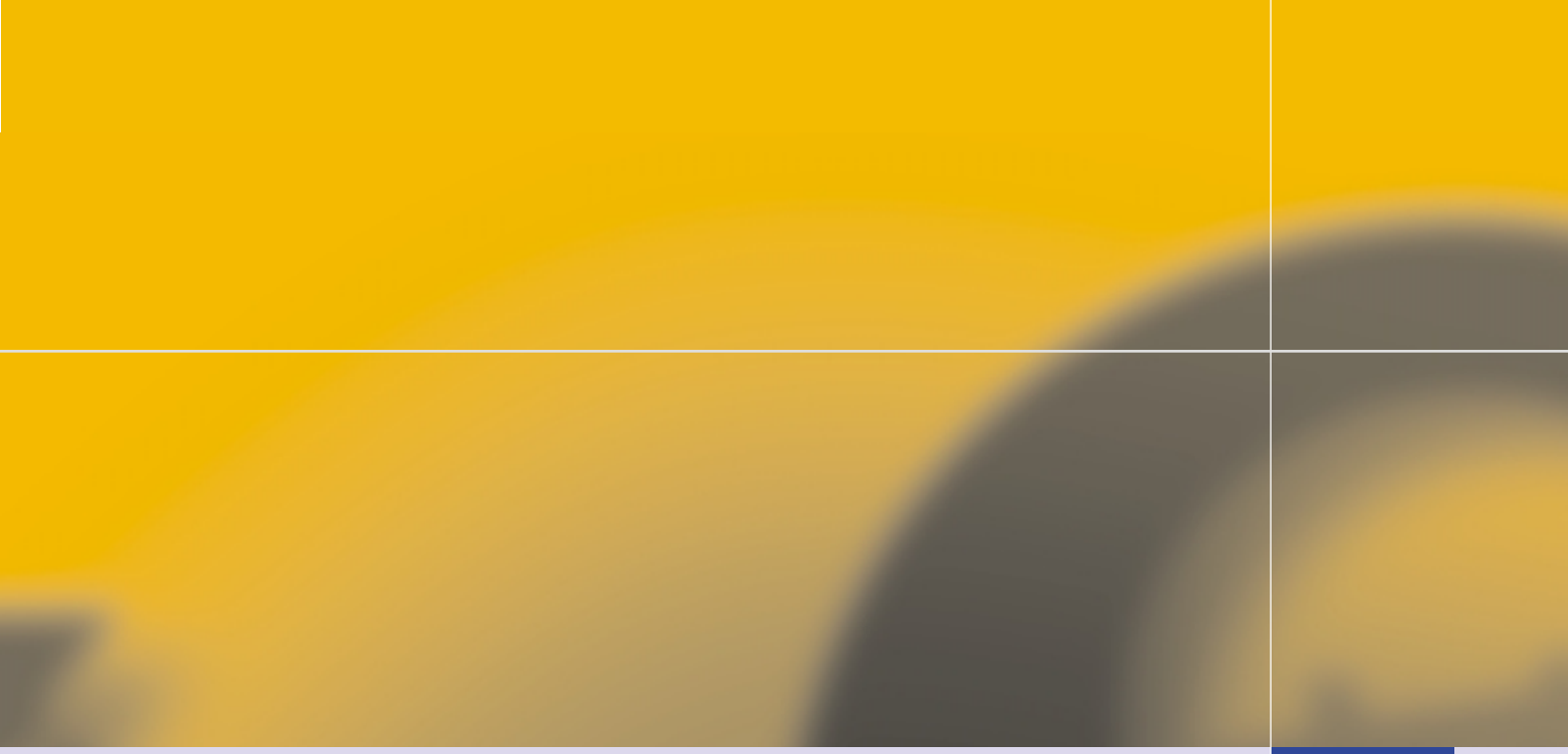
Small enterprises focus essentially on their core activities. There are generally no specific internal resources available for other aspects such as health and safety. The knowledge required has to come from outside the enterprise. The expertise is available through external structures: sectoral organisations, trade associations, insurance companies, inspections, etc.

Direct contacts with the enterprises have a strong impact on the development of a company safety and health policy.

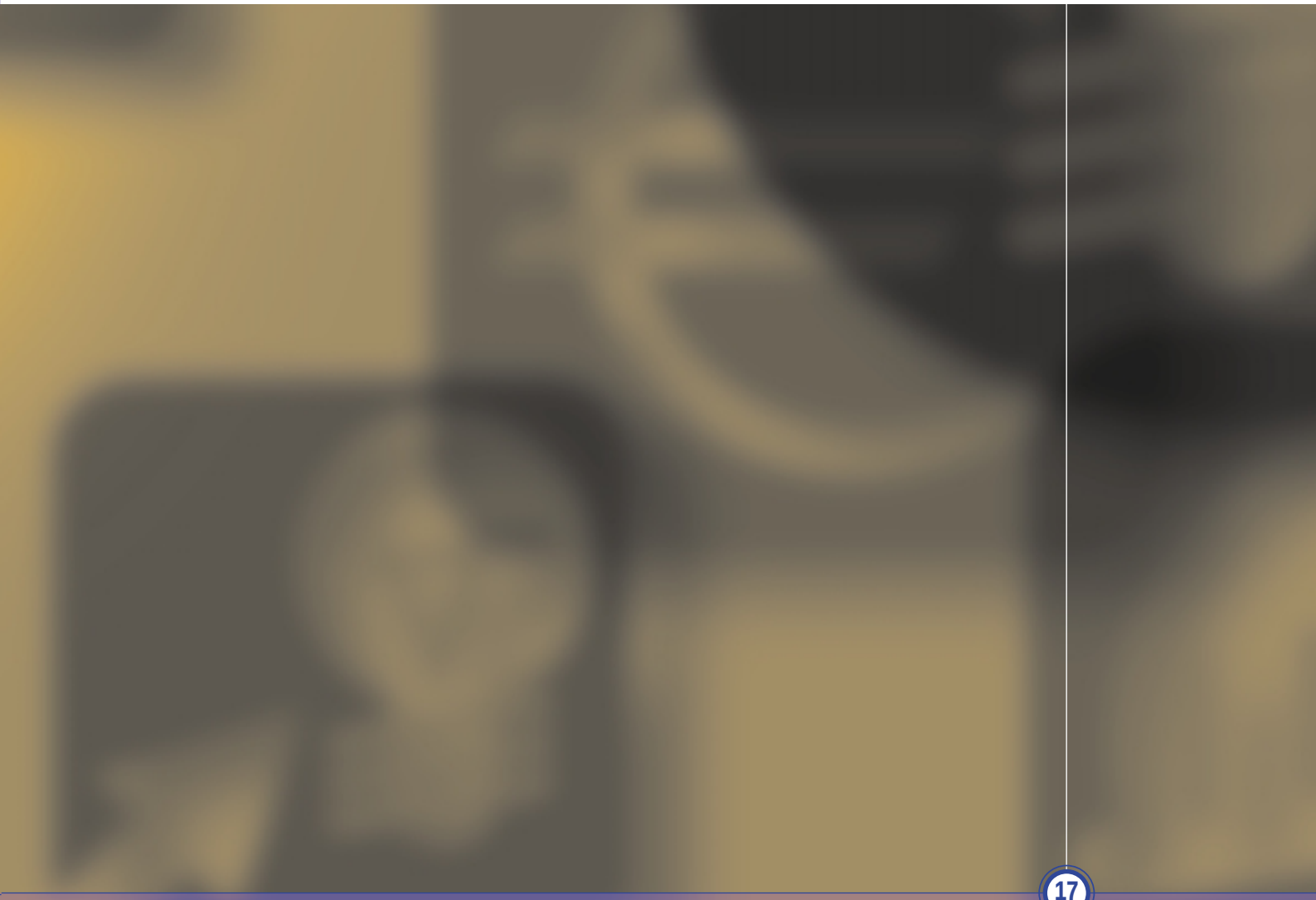
In 16 of the 24 enterprises, the risks were identified with the help of an outside body. In most cases, these are trade associations as well as consultants, inspection services, insurance companies and external prevention services, often combined.

The outside bodies supporting risk assessment were in most cases involved in the practical development of safety and health measures. However, some small enterprises have developed measures without any outside help.

In the instance where a mechanical or technical solution was introduced into the company in order to reduce the risk, it was an external organisation that checked the installation.



4. *Quantitative and qualitative case evaluation*



Quantitative and qualitative case evaluation

Worker satisfaction

In 17 of the 24 cases, the workers expressed their satisfaction following the introduction of the good practice.

Tintoreria Penalba:

"The workers have taken note of the constant efforts undertaken by the company to improve safety and health conditions in the workplace, which has resulted in a reduction of the likelihood of incidents and accidents. The workers have shown their gratitude in numerous instances since the cost of new practices presupposes a significant increase in the budget item for the prevention of industrial accident risks"

Customer satisfaction

The enterprises reacted differently to this issue. Some of them reported increased customer satisfaction while others are aware that the new measures are not always directly obvious to customers because the latter are not involved in the company's day-to-day work.

Institut Saint-Laurent:

"Less sick leave and more efficiency. The customers appreciate these new practices through the dynamism and efficiency of their beautician"

Tintoreria Penalba:

"Customers have expressed their satisfaction regarding the reduction of contamination in the workplace with, as an immediate consequence, a reduction in the smell of solvent in the company"

Sarl Mairel:

"The packing according to zones is very much appreciated by the customers and other firms involved on the building site. The impact on recognition of the company's professionalism is very substantial"

Nicomax:

"The company's main customer is a domestic appliance manufacturer that is very well known in Europe. If the good practices implemented had not been successful, we could have been facing a relocation of operations"

Economic success

9 of the 24 enterprises reported an average contribution, while 7 enterprises announced a higher contribution and 2 indicated a poor contribution. Only a small number of enterprises were able to make a quantitative evaluation.
The other enterprises estimated that the introduction of the good practice had helped give the company a more efficient image.

Tintoreria Penalba:

"Thanks to the improvement in the quality of its service, the firm witnessed a higher volume of orders, which translated into an increase in turnover accompanied by greater competitiveness and also enhanced the company's reputation on the market"

Beauty Care Centre:

"The efficiency results in higher returns, plus improved credibility and a reputation of reliability"

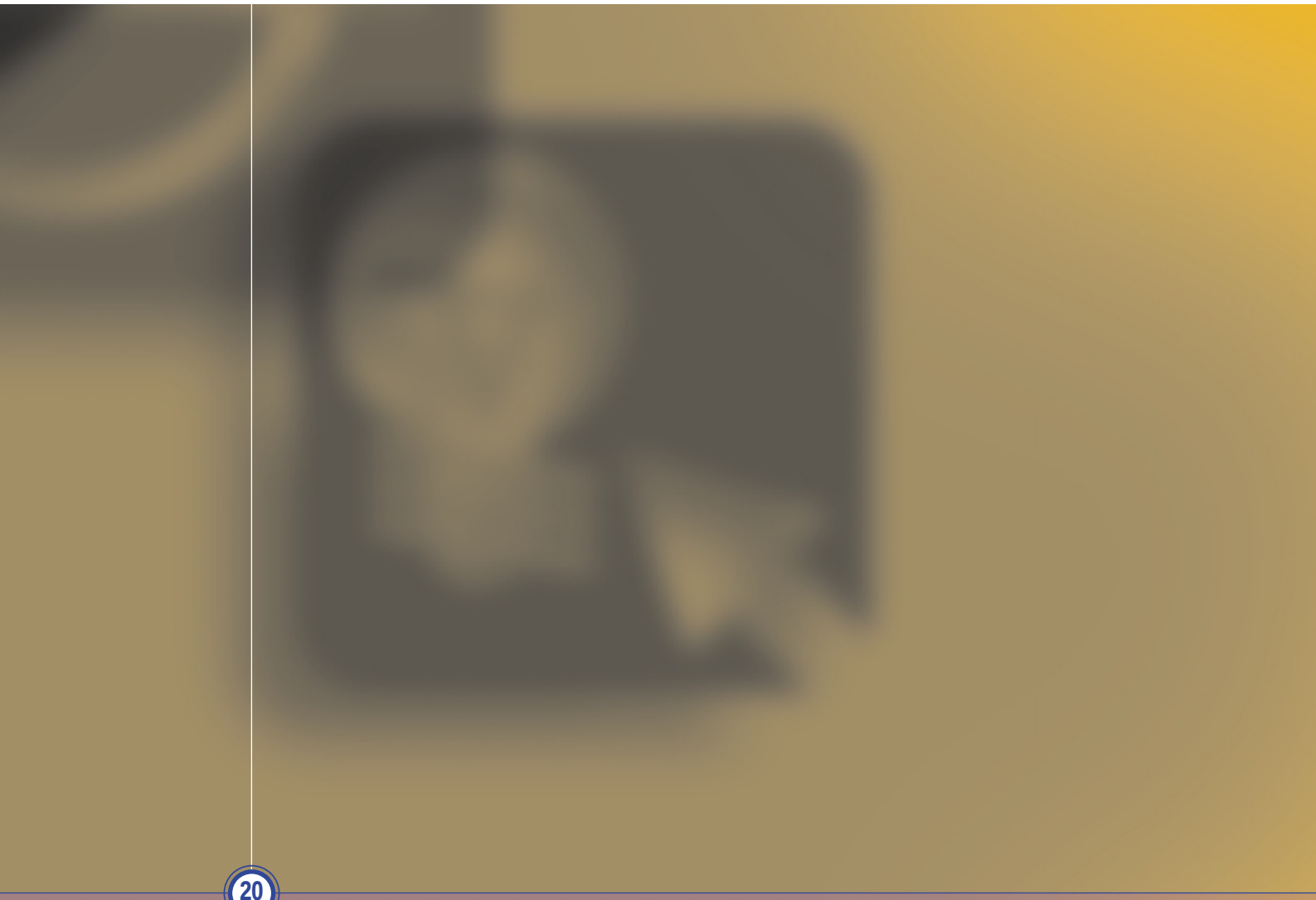
Sarl Mairel :

"In terms of corporate image as well as improving the organisation of the site and the working conditions of the employees."

Boscolo :

"Even if the implementation of good practice norms has not been a major factor in the success of the enterprise, it has, on the other hand, led to significant savings if we consider the direct or indirect consequences of accidents when the good practices were not implemented. We only have to think about the losses caused by workers being on sick leave, the increase in insurance premiums (INAIL), the inevitable interruption of work on the building site, the investigations carried out by the relevant control bodies and the consequences of the case concerned."

5. *Summary table of Good Practices*



COUNTRIES & COMPANIES	SECTORS	TASKS	RISKS
AUSTRIA			
Eybl Sportbau	Construction of sportsfields	Lawn laying	Musculoskeletal disorders
Glück Werkzeug- und Maschinenbau	Marchinery construction and metal processing	Grinding and polishing of metal parts	Exposure to cutting fluids
Josef Puntinger Gesellschaft	Automotive trade, garage, repairs	Arrival and departure of vehicles	Collision
Josef Puntinger Gesellschaft	Automotive trade, garage, repairs	Repairs to cars which are on a lifting platform	Risk of being crushed
Metallbau Wastler	Manufacture of metal structures	Degreasing	Exposure to organic solvents
Obersteirische Druckerei	Printing industry	Printing	Impaired hearing
BELGIUM			
Hoste Algemene Bouw	Woodworking company	Handling of wooden panels	Wood dust exposure; Explosion and fire
Neyens Garage	Garage Manufacture	Varnishing	Solvent exposure; Explosion and fire
Van Meurs Orthotech	orthopedic equipment	Adjusting orthopedic equipment on patients	Exposure to solvents & dust; Musculoskeletal diseases
SPAIN			
Andres Pintaluba	Agricultural and food industry	Packing and filling	Falls
Dinamic laser	Metal construction company	Constuction of metal parts	Impaired hearing and vision; Dermatitis due to chemical exposure Back disorders:
Innaca	Distribution and transport of gas cylinders	Handling of gas cylinders	Falling objects
Tintoreria industrial penalba	Chemical laundry	Laundry work	Solvent exposure
FRANCE			
Centre de soins esthétiques	Beauty salon	Massages, body care, hair removal	Back disorders; Risk of contamination
Institut Saint-Laurent	Beauty salon	Massages, body care, hair removal	Back disorders; Risk of contamination
Menuiserie Jacky Thienot	Woodworking company	Handling of wooden panels	Musculoskeletal disorders; Risk of being crushed
Sarl Mairel Charpente Couverture	Woodworking company	Handling of wooden panels	Musculoskeletal disorders; Risk of being crushed
ITALY			
Boscolo 'Bielo' Ivano	Wholesale trade	Loading and unloading	Falling objects; Risk of being crushed; Exposure to toxic fumes
Cromatura Cassanese	Metalworking	Metal polishing	Dust exposure; Fire
Guerrini & Bardelli	Joinery	Manufacture of doorframes	Cuts and lesions
Nicomax	Metalworking	Metal polishing	Explosion and fire
THE NETHERLANDS			
Schoonheidscentrum Simone	Beauty salon	Massages, body care, hair removal	Back disorders; Risk of contamination
UNITED-KINGDOM			
Aberley House Nursing Home	Nursing home	Lifting of patients	Back disorders
London Borough of Greenwich	Construction	Co-ordinating the work of subcontractors on a building site	Accidents
Oxford safety Components Ltd	Construction – Carpentry	Construction of wooden frames	Falls

Prevention of musculoskeletal disorders among artificial lawn layers

EYBL - Sportbau GmbH

Magazinstrasse 8-10
A-4600 Wels

Tel.: + 43 07242/65836
Fax : + 43 07242/65836-23
http://www.eys.at

Construction of sports fields
38 employees

Artificial lawn layers suffer from back disorders caused by their kneeling in awkward positions. Eybl Sportbau eliminated this risk through the automation of the task.

The task

The Company Eybl-Sportbau is an Austrian company whose main activity is trade in sports items and the construction of sports fields. The company has clients in Austria, Italy and Germany and sells, places and pastes about 100.000 m^2 artificial lawn. The pasting procedure is a manual and time-consuming task. The paste is mixed to produce a liquid mixture and fed into the pasting machine. In order to apply the paste, the pasting surface is passed over the pasting machine which has a 20-60m pasting width. The artificial lawn pieces are put on the pasting surface and rolled on manually. This work is performed about 100 times per season (March to November) and takes about 1 hour per day, for about 100 to 150 pasting widths.

The risk

Lawn layers work in awkward positions (e.g. bent or kneeling), which cause back disorders.

The solution and methodology

Eybl Sportbau performed a risk assessment using the risk assessment model developed by the Österreichische Unfallversicherungsanstalt AUVA.
The risk assessment indicated that the main factors were the bent and kneeling working positions. To eliminate the risk Eybl Sportbau developed and constructed a machine which automated the pasting procedure. The solution involved changes in work equipment, changes in work organisation and procedures, including the replacement of a toxic paste by a less dangerous pasting substance.
It is a solution developed by the company itself, where the employees have developed the machine and assure the quality internally.

"The ergonomic design of our workplaces helps to maintain the health and safety of our employees. This constitutes an essential contribution to the motivation of our employees which (in turn) benefits our company and our clients. Our employees are continually trained in environmental and safety procedures. Each employee at Eybl Sportbau knows about the importance of first aid and safety for himself and others."

Entrepreneur's Testimony

The effectiveness of results

The solution completely eliminated the risk:

- *The solution completely eliminated the risk:*
- *The employees no longer carry out this work in a kneeling or bent position;*
- *The product quality was improved. Thanks to the even distribution of the glue on the surface, it does not dry out and sticks better;*
- *The work process was improved ;*

The solution is transferable. Each year about 2 million m^2 of artificial lawn is produced in the European Union, which is pasted manually. In Austria about 100 000m^2 is pasted each year. At the Cologne trade fair on sports construction, similar pasting machines were presented, and the Austrian machine was used as a model.

The employee involvment

Employees participated in the risk assessment and in the development of the new machine. The employees constructed the machine ; the quality is controlled by the quality manager.

The costs and benefits

Work organisation has been improved: The paste can be applied more rapidely which reduces the time needed to lay and stick the artificial lawn. The number of manual applications have been reduced by one third. This development has enabled an improvement in the quality of the products.

More information

AUVA (Allgemeine Unfallversicherungsanstalt)
Adalbert-Stifterstraße 65
A-1201 Wien Postfach 200
Tel. : + 43 01 33 111 – 0
http://www.auva.sozvers.at

Reduction of exposure to cutting fluids

Glück Johann Werkzeug- und Maschinenbau GmbH & CO KG

Lange Gasse 9
A-4493 Wolfern

Tel.: + 43 07253/20000
Fax: + 43 07253/20000-20
E-mail: office@werkzeugmaschinenbau.at

Metal processing and machine construction
10 employees

Cutting fluids are used as coolants, lubricants and corrosion inhibitors in many metal-working processes. Cutting fluids however represent health dangers. Machine manufacturer Glück installed a siphon which filters aerosols and prevents them from being released into the surrounding air

The task

Glück is a metal-processing company in Upper Austria. Its main activities are production, grinding and case hardening of metal parts. During the processes of cultivating and grinding, it is important that the tool is cooled and lubricated with the aid of a coolant. This cutting fluid is pumped into the tool. As the tool rotates, the coolant is vaporised and builds aerosols. The task has to be performed daily for each employee in the course of 8 hours per day. The employee's working clothes are usually soaked with the chemical substance.

The risk

The employee is exposed to aerosols, which may harm the respiratory system and damage the lungs. Polluted cutting fluids may produce fungi that can cause skin and eye irritation. Depending on the quality of the water used for diluting, nitrous gas may be produced. If cutting fluids are not given regular maintenance, mould may appear.

The solution and methodology

The company performed a risk assessment prior to the solution to determine on the one hand the risks of the chemical product (Streulichtanalyse), and on the other the general working conditions with regard to the machines, the workplace etc.
In order to reduce the exposure, a technical solution has been implemented by means of the installation of an "aerosol trap". Aerosols are siphoned directly above the metal pieces in order to prevent the aerosols being released into the ambient air. Initially, the drops are separated by a metal filter and then passed onto a 4-level plastic filter, which separates the drops into 10 µm, 2 µm and 0,2 µm. 99.92% are separated in the filter (99.8% separation in total). The provider of the technical solution is the company Kappa Arbeitsschutz und Umwelttechnik GmbH, Steyr.

"In the future, the manufacture of a good product will only be possible if the working environment is good and well-trained workers are available."

The effectiveness of results

The solution is transferable to other environments where metal is processed. The good practice example eliminated or at least considerably reduced the risk: 99.9% seperation production; 80-85 % are siphoned by the machine.

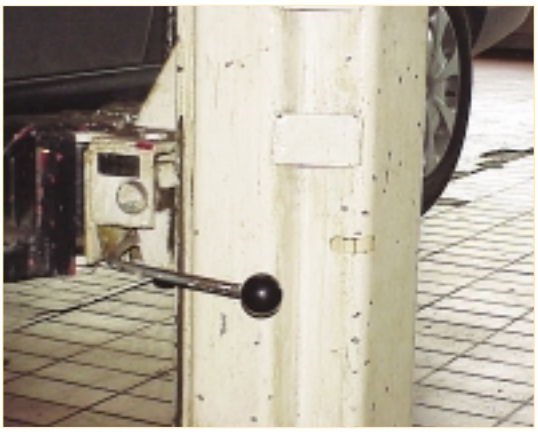
The employee involvment

All employees working on these machines have been involved in the development and implementation of the good practice example. They have also received training on how to work safely with the siphons.

The costs and benefits

A clear cost-benefit relationship could not be established. However, there was a perciptible reduction in the tiredness and irritability of employees, as well as an increase in their ability to concentrate.
Work organisation has been improved. Employees are less irritable. The quality of products has been improved by 9%. This example shows that occupational health and safety in SMEs leads to increased productivity and therefore better economic performance.

Safe layout of lifting platforms in a car repair garage



Josef Puntinger GmbH. & Co KG

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http://www.puntinger.at

Automotive trade, Garage
50 employees

Lifting platforms in garages are a constant danger for employees working under and around vehicles. Puntinger Maintenance & Car Repair fitted automatic rests to the lifting platform to prevent the car from falling

The task

Josef Puntinger GmbH & Co KG is a garage in Austria dealing with maintenance and car repair. It uses a lifting platform to allow for checking, maintenance and repair whilst working under the vehicle. Raising the vehicle allows the worker to work in an upright position in order to prevent back disorders. The lifting platform is used several times per day for repetitive work.

The risk

The lifting platform works with compressed air. If the pressure drops, there is a risk that the worker will be crushed by the vehicle.

The solution and methodology

The company carried out a risk assessment with the help of an external safety expert. As a result of the assessment, a mechanical protection device was installed, consisting of an automatic rest which prevents the car from falling.

All employees are thoroughly instructed on how the controls work, the use of the safety device, and the safety procedures to be followed in the event of an emergency. Before every vehicle is lifted, employees ensure that the vehicle is correctly positioned on the platform and that the platform is never loaded beyond its capacity.

The lifting platform needs to be checked on a regular basis. Preventative services perform yearly controls on the correct operation of the device, while an external control organisation checks the platform every four years.

"The ergonomic layout of our workplace helps to preserve the health and safety of our workers. This makes an important contribution towards their motivation and therefore benefits our business and our customers. The safety of our customers at the wheel is an important aim of our activity. The safety of our employees has to be ensured in the same way."

Entrepreneur's Testimony

The effectiveness of results

The solution is a very simple one and is transferable to other enterprises. However, the effectiveness of the solution and the type of device used to prevent cars falling depends on the type of lifting platform. Several other solutions are possible with regard to hydraulic or pneumatic or electrical operation systems. The choice of the solution takes the technical and legislative prescriptions of each country into consideration.
No accident occured with the new device.

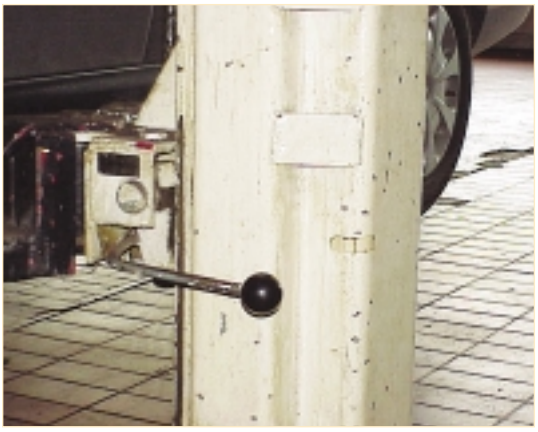
The employee involvment

All employees were given training and information relating to the new solution. The lifting platforms are checked by an employee once a year.

The costs and benefits

The technical solution represented a fairly small investment cost, while the capacity for accident prevention is high.

Road safety on industrial and commercial sites



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Automotive trade, garage, car repairs
50 employees

Serious work accidents are a common occurrence in pedestrian and vehicle areas on industrial and commercial sites. At the Josef Puntinger vehicle workshop, pedestrian and vehicle traffic is kept separate by means of a system of properly regulated signs.

The task

Josef Puntinger Gesellschaft m.b.H. & Co KG is a small vehicle sale and repair business. The routes on the company's site are used for vehicle arrivals and departures, workplace access and customer traffic.

The risk

Accidents involving employees and customers can occur as vehicles arrive or are driven away. Employees and customers who use the routes on the site as pedestrians are especially exposed to risk. The accidents that occur in these circumstances can be particularly serious.

The solution and methodology

Introducing a safe design for the routes in question reduces the number of accidents. Separating pedestrian and vehicle traffic contributes significantly to increasing levels of safety. This kind of separation is particularly important in critical traffic areas such as busy vehicle entrances and exits. Traffic and work areas are kept separate by means of a precise system of colour coding for vehicle routes.

"Our customers' road safety is a significant goal of our business. Likewise, our employees' safety must be ensured at all times."

Entrepreneur's Testimony

The effectiveness of results

This measure can be very easily transferred to other businesses, reducing the risk of accidents. The markings are renewed regularly.

Further measures, such as the use of barriers alongside the danger area, or of signs displaying orders and prohibitions for pedestrians, are also among the possible ways of reducing risks. Routes that are intended for pedestrian use only should be marked as such with a sign. These signs also indicate to drivers that the routes in question are closed to vehicles.

Vehicle routes can also be clearly separated from pedestrian routes by various forms of surfacing, ground studs, lighting, crash barriers or landscaping.

The employee involvment

All employees are bound to adhere to the displayed instructions.

The costs and benefits

In return for low investment costs, a considerable element of risk for vehicle technicians can be avoided.

The substitution of an organic solvent in the pre-treatment of metal surfaces

Metallbau Wastler GmbH

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Metal construction
88 employees

Organic solvents are used in the metal manufacturing industry for removing grease from metal objects. However, the inhalation of solvent vapours can pose health risks. Metallbau Wastler GmbH assessed the risks and replaced the harmful solvent by a watersoluble chemical in order to avoid skin allergies.

The task

Metallbau Wastler GmbH is a manufacturer of metal structures. The metal manufacturing industry uses toxic substances for the grease removal process. Grease removal is the process in which grease and adhesive materials are removed from the surface of metal prior to painting and varnishing.

One of the most widely practised types of grease removal carried out in the industry is the use of organic solvents. Solvents are particularly suitable for cleaning and for dissolving products that are not water-soluble, such as grease. One employee is performing this task during 8 hours a day.

The risk

Repeated or prolonged skin contact with solvents can cause the skin's natural oils to disappear and can consequently produce rashes, drying and cracking of the skin, itching, etc. Furthermore, these solvents have a tendency to cause allergies, to irritate the lungs, the eyes and the respiratory tract, and to affect the blood count.
Besides this, there is a danger of fire or explosion if the solvent is used in enclosed spaces, and storage is difficult because of restrictions on quantities.

The solution and methodology

Metallbau Wastler is aware of the risks caused by the use of solvents and performed a risk assessment based on the procedure put forward by the Allgemeine Unfallversicherungsanstalt AUVA. AUVA together with trade unions, employers' organisations and R&D institutes developed a risk assessment procedure which is available to all Austrian enterprises. The basic data are assessed with the help of safety data sheets, Risk-phrases and the matrix method. Some 100 companies from Upper Austria participated in this sector project. About 1/3 of the participating companies were sufficiently convinced by the results to substitute the dangerous substances.
The working process was analysed by an external consultant in the framework of an environmental project. After assessment and evaluation of the chemical substance, the replacement of the organic solvent was suggested and the water soluble chemical "Tarco Super" was presented.

This chemical has the same grease removal qualities as the solvent but is harmless to health and the environment. The working conditions have thereby been improved.

"Our enterprise meets business management, quality, social, and environmental requirements. Our aims are:
• to increase the satisfaction of our customers
• to optimise quality
• to increase the motivation of our employees
• efficient and sustainable use of resources
• to respect existing rules and laws "

Entrepreneur's Testimony

The effectiveness of results

The substitution has proved to be extremely effective, since the risk of skin allergies and other health and safety problems is completely eliminated. The water soluble chemical has the same grease removal qualities as the organic solvent and is less dangerous for people's health and the environment.

The employee involvment

The employees participated in the assessment of the situation. Each employee received training on the use and the characteristics of the new substance.

The costs and benefits

It was not possibly to identify measurable results with regard to a reduction in the number of accidents. However, benefits could be observed concerning: the removal of the need for investment in a depot for dangerous substances; the prevention of illnesses for the employee; a reduction of the VOC-emissions (volatile organic compounds).

More information

AUVA (Allgemeine Unfallversicherungsanstalt)
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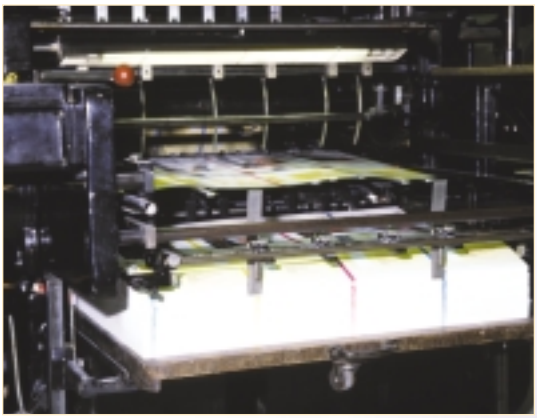
http://www.auva.sozvers.at

Noise protection in a printing company



Obersteirische Druckerei und Verlagsges mbH

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Printing press
47 employees

Printing presses are a major source of high noise levels in the printing industry. The Obersteirische Druckerei und Verlagsges.mbH tackled the risk by the use of noise absorbing elements in the production hall.

The task

The Obersteirische Druckerei und Verlagsges mbH is a publishing and printing company. The printing presses are concentrated in a production hall and produce high levels of noise.

The risk

Continued exposure to high noise levels at work results in employees becoming progressively deaf. This loss of hearing is permanent and irreversible. Excessive noise is also annoying and reduces efficiency by hindering communication. Hearing damage is cumulative.

Noise is measured in decibels dB(A). The noise level is measured so that every 3 dB(A) increase means a doubling of the noise energy, for example 93 dB(A) is twice as hazardous as 90 dB(A). In most jobs, the risk depends not just on the noise levels, but also on how long people are exposed.

Hearing damage due to noise is an occupational disease, which is likely to occur in workplaces which are permanently exposed to noise levels with more than 85 dB(A). Rooms with smooth surfaces always reflect noise, which means that noise is also felt in places away from its origin. Sonic reflections which occur at the place of origin lead to an increase of the exposure level of about 10 db(A) as well as to a reduction of communication between employees.

The solution and methodology

The Obersteirische Druckerei und Verlagsges mbH performed a risk assessment, assisted by a safety expert and an occupational doctor. Noise has been recognised as a hazard in rooms where printing presses are used.

The hierarchy of preventive measures starts with the elimination of the problem at the source. The control of noise exposure should preferably be done at an early stage, i.e. at the time when the machine is designed. Manufacturers and designers must reduce the noise by good design and construction and provide noise data with their equipment if levels are likely to reach or exceed the first action level. Noisy machines that are already installed can be isolated with acoustic enclosures. These have to be made of appropriate noise-reducing materials and correctly installed. The design of machine rooms with sound absorbent materials on walls and ceilings can help to improve the acoustic environment. The last stage of the hierarchy is the recourse to individual protection where employees must wear hearing protection. However, it is clear that this is not a substitute for noise reduction at source. At all stages, it is important to reduce the number of employees exposed as well as the working time in the noise environment.

As it was impossible to change the machines, the company decided to take soundproofing measures. Noise absorbing elements reduce the noise in the production hall.

"Safe workplaces are a decisive factor for the satisfaction of our employees. Satisfied employees are motivated to perform better."

The effectiveness of results

The implementation of soundproofing measures obtained a noise reduction of about 7 dB(A) for all employees.

The employee involvment

Employees and the health and safety inspectors participated in the planning and the reconstruction of the production hall.

Keeping sawdust exposure under control in a small carpentry shop

Hoste Algemeen Bouw

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Contact person: M. Hoste

Woodworking

2 employees

In a carpentry shop, the employees, when they operate woodworking machines, are exposed to a number of risks, amongst them the exposure to sawdust. With the aid of a checklist compiled by the external accident-prevention service, the existing sawdust-exhaust installation was thoroughly examined. This resulted in a number of recommendations to optimize the installation. They were implemented step by step.

The task

Hoste Algemene Bouw is a small-scale carpentry shop where the primary activity consists of mechanically working wood by the use of various woodworking machines (sawing, milling, boring, sanding, etc.).

The risk

During this work, the employees are exposed to various safety and health risks. The operation of the woodworking machines regularly results in serious industrial accidents. Furthermore, there is the risk of fire and explosion through the production of shavings and particularly of fine sawdust. The sawdust that is produced during mechanical woodworking not only involves a risk of fire: if the sawdust is not adequately removed, it can hinder the work and damage health. It is known that adenocarcinoma can be caused by inhaling the sawdust of hardwoods such as oak, beech, teak, and mahogany, and irritant and allergic reactions on the skin and mucous membranes are stimulated by the sawdust of certain tropical woods. Most woodworking machines also produce a high level of noise with the attendant risk of impaired hearing.

The solution and methodology

The existing installation was subject to a thorough examination together with the employer and the employees with the aid of an extensive checklist: 'Dust control in carpentry shops' compiled by the external accident-prevention service. On the basis of the observations, a series of proposals was formulated to improve matters. They were implemented by the employer in collaboration with the manufacturer of the machines and the installer of the sawdust-extraction system.

All the machines were connected to a very reliable sawdust extractor. The collector of shavings and sawdust was installed outside the workplace with the necessary protective devices against fire and explosion. For the hand-held tools, a movable arm was installed above the worktable with a connection between these machines and the central sawdust-extraction system. Further, more extensive requirements in terms of health and safety, were placed on the purchase of machines. They are equipped with additional protective devices which go beyond the legal requirements. Attention is also given to the noise level, for example, by the selection of low-noise saw blades. Finally, much attention is given to having a tidy workplace and to the safe storage of material and equipment. The workplace is itself cleaned every day with a special vacuum cleaner.

"We aim at being an example of quality and good manufacturing practices. This is the only way forward for small business managers."

Entrepreneur's Testimony

The effectiveness of results

After carrying out the changes, the installation was again subjected to a thorough inspection by the external accident-prevention service together with the employer. It was noted that the sawdust-extraction installation worked very well. The protective devices of the machines and the order and tidiness in the workplace were judged to be excellent.

The employee involvment

The employees were involved in the inspection of the installation before and after the changes. Furthermore, the employees are responsible for the daily maintenance of the workplace.

The costs and benefits

The cost/benefit ratio is not the first concern of the employer but rather the safety and health of his personnel. These improvements are part of the policy of the firm that is directed to the enhancing the well-being of its employees. A sawdust-extraction installation that works well and a well-maintained workplace, along with the safety and health of the employees, also benefit the quality of the work.

More information

IKMO (Externe dienst voor preventie en bescherming)
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Installation of a spray gun cleaning system in a garage

Garage Neyens

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Fax: +32 3 775 60 19
Contact person: M. Neyens

Garage

2 employees

In a garage with a bodywork section, the employees can be exposed to solvents. The paint spraying is done in a professional spray cabin equipped with an exhaust system which reduceds exposure. The exposure is often higher during certain other activities, such as the cleaning of the spray gun. After a risk analysis by the external service for accident prevention and protection at work, the Neyens Garage invested in a closed cleaning apparatus.

The task

Neyens Garage is a classic, small-scale garage that performs both mechanical automobile maintenance and bodywork repair. The bodyworker prepares the items, spays them, and finishes them. He prepares the paint in a mixing room equipped with an exhaust system as well as maintaining the spray equipment. During the cleaning of the spray gun, pure solvent is forced through the spray gun.

The risk

Solvents are released, both during the spraying of the paint and during the cleaning of the spray gun. Such solvents are highly flammable, mix easily with the air, and quickly form explosive mixtures.
In addition to the safety risks, there are also health risks. Solvents have an irritant and hydrating effect on the skin. They irritate the eyes and the respiratory organs. Solvents affect the kidneys and the central nervous system and can provoke an organic psychological syndrome. Certain solvents can also cause liver damage, and some can have an effect on the blood cells.

The solution and methodology

The external service for accident prevention and protection at work conducted a risk analysis using a specific checklist for SMEs. This analysis indicated that there was increased exposure to solvents during the cleaning of the spray gun because, during the cleaning of the spray gun, pure solvent is forced through it into an ordinary vat. Thus, almost all of the solvent will evaporate.

Therefore, it was decided to purchase a closed cleaning apparatus for the spray gun with filters on the exhaust.

" We aim to be at the forefront of quality, both in terms of the work itself and in the tools and equipment we provide."

Entrepreneur's Testimony

The effectiveness of results

The new installation limits the existing safety and health risks. Thus, there is an improvement of the working conditions for the employees.

Such a closed cleaning system can be used in all firms which use a spray gun.

The employee involvment

The employees were involved in the execution of the risk analysis and the installation of the new apparatus.

The costs and benefits

The cost/benefit ratio is not the first concern for the employer, but rather the safety and health of his personnel. This improvement is part of the policy of the firm, which is intended to improve the welfare of its employees.

With the installation of the cleaning apparatus, less solvent is lost. This means that raw material is saved and that there is less damage to the environment. Moreover less time is spent on cleaning in the workplace itself.

More information

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Fax: + 32 50 47 41 10
E-mail: info@ikmo.be

Re-equipping an orthopedic lab

Van Meurs Orthotech

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Fax: + 32 50 33 18 55
E-mail: info@vanmeurs.be
http://www.vanmeurs.be
Contact person: M. Van Meurs

Orthopedic lab

3 employees

During the manufacture of orthopedic equipment, the employee is exposed to solvents and dust. Poor ergonomic posture increases the risk of musculoskeletal diseases. With the help of an external prevention service, the company carried out a risk assessment by measuring exposure. It was decided that new machinery would be installed in order to reduce risk.

The task

The Van Meurs orthopedic laboratory produces a range of products such as orthopedic soles and shoes, prostheses, orthotics, and corsets. All these products are completely tailor-made. A discussion is first held with the client in order to define the needs and specific requirements and to take the measurements. A template is then produced, tryouts take place, and finally the apparatus is adjusted (in the case of a prosthesis) or delivered (a pair of shoes, for example) to the client.

The more specific tasks that were the object of particular attention because of the risks they represent are the adjustment of the orthopedic devices on the patient, the cutting of models on a table, the application of glue and resin, and the use of a small cutter.

The risk

During the adjustment of the orthopedic devices, such as a prosthesis on the client, the workers are not always in an ergonomic position with the concomitant risk of lumbago and the musculo-skeletal problems. In the same way, when they have to cut the models for the fabrication of the various orthopedic devices, the workers are not always in a good position for the back.
In addition to these ergonomic risks, the workers are also exposed to solvents (use of glue and resins) and dust from the cutting of the pieces and the manufacture of the orthopedic devices.

The solution and methodology

After complaints from the workers, Van Meurs conducted a participatory risk analysis with the aid of an external accident-prevention service. Exposure to solvents and dust was measured, and the positions of the workers during the performance of their various tasks were observed and discussed.

After this analysis, it was decided to renew the equipment and the tools of the company. To eliminate the risk of lumbago and musculoskeletal problems, height-adjustable tables were installed.

The dust-extraction system was also modified.

"In our enterprise, prevention is on equal footing with productivity, quality and output. This implies that anyone has responsability for taking care of its own health and safety and of the health and safety of his/her colleagues".

Entrepreneur's Testimony

The effectiveness of results

The solution is transferable to other companies and sectors. The solution reduced the existing risk without modifying its nature. It resulted in an improvement of the working conditions and thereby engendered a better environment and improved productivity.

The employee involvment

Since it was a participatory risk analysis, the workers were involved in the inventorying of the risks and the search for appropriate solutions.

The costs and benefits

The cost-benefit ratio was not the primary concern of the manager of the company but rather the well-being of the workers. The improvements made are part of the general policy of the company and particularly concerning well-being at work.

Installation of a lifeline

Andres Pintaluba sa

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http://www.pintaluba.com
Contact person: Sra. Esther Marsillach

Agricultural and food industry

65 employees

During the transport of foodstuffs and more specifically during the loading and unloading of tanks, there is a risk of falling. The enterprise Andres Pintaluba has strengthened the safety measures in order to reduce this risk.

The task

Food products are transported by means of tank trucks, which have to be loaded and emptied. During the loading and the emptying of the tank, the driver or the person in charge has to climb onto the top of the tank to open the covers. The tanks are fitted with a protective rail. Pintaluba, nevertheless, decided to install an additional life-line because this rail is not high enough to protect the worker who is on the top of the tank and, moreover, is located only on one side.

The risk

The risk is considered moderate in relation to the gravity of the accident if the worker falls from the top of the tank. This means that, even if there were relatively little chance that the worker would fall, the severity of the accident that would result would be too high to justify not taking an additional safety measure.

The solution and methodology

Pintaluba called upon an external accident-prevention service to find out if this protective measure would be sufficient to avoid falls from the top of the tanks. The beneficiaries of this safety measure are mainly the drivers, who have to climb onto the tanks or those in charge of the filling and emptying of the tanks.

To evaluate the severity of the accident, one calculated the distance between the ground and the height of the tanks. Given that it was a height of about 3.70 m, the severity is considered significant. The probability of a fall is less under optimum conditions (good weather, tanks with anti-slip pads, protection rail, etc.). Nevertheless, if one of these conditions deteriorates or if the protective devices are lacking, the probability would then be medium, and the risk would be moderate to serious.

"At Andres Pintaluba, accident prevention is dealt with on an equal footing with productivity, quality, and profitability. This means that each person takes responsibility for his safety and health as well as that of his colleagues. Our company is committed to assuring the health and safety of each employee, customer, visitor, and partner on the premises. These efforts are made in the interest of the company and the totality of the community in which we work."

Entrepreneur's Testimony

The effectiveness of results

The enterprise is presently at the stage of implementing the accident-prevention measure and has not yet been able to evaluate the results. The personnel of the company are aware of the positive results achieved in other companies in the same sector.

The employee involvment

The technicians in charge of accident-prevention in the company, the drivers, as well as those in charge of the loading and the emptying supported this project, which they consider excellent in view of their experience.

The costs and benefits

The investment is estimated at 1,868.97 euros.

Preventive organization

Dinamic Laser

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Poligon Industrial Les Verges
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Tel.: + 34 93 8272600
Contact person: Sr. Antoni Vilella

Manufacture of metal parts

43 employees

During the manufacture of metal parts, the risks are manifold. Following a risk analysis, Dinamic Laser developed an accident-prevention plan to cope with all of the risks.

The task

The fabrication of metal parts is a manufacturing process that has five phases.
First, the cutting, during which the items are cut by means of guillotines and trimming machines. Then comes the punching during which the punching operations are performed on the items by means of stamping machines, dotting machines, and laser. Next there is the profiling phase which involves folding and threading machines. Then comes the assembly phase, during which the welding operations are performed. Finally, at the end of the production line, there is the finishing phase, to which all the products of the company arrive. A polishing machine does the polishing.

The risk

The risks are many and varied:

- *falls due to the accumulation of slippery materials on the floor as well as the lack of space between the machines;*
- *excessive effort due to the weight of certain items;*
- *cuts during the handling of the items and the different machines;*
- *risks of hearing damage caused by falling materials;*
- *eye lesions due to projection of particles;*
- *risk of skin reactions caused by the handling of various products.*

The solution and methodology

On the basis of the risk assessment, adequate corrective measures were taken in order to reduce or eliminate all the risks. To ensure the application of the corrective measures, the company devised an organizational tool. An internal accident-prevention service was created consisting of the person responsible for preventing on-the-job accidents and by workers trained in a

basic course for preventing on-the-job accidents.

The function of this accident-prevention service is to see to it that, at each phase of activity, the safety measures set by the company are respected. The fact that the workers themselves supervise compliance with these measures has turned out to be very beneficial. Indeed, they know perfectly how each job is performed. The workers also have to see to it that no new risks develop in their work place.

This system depends on the vigilance of all the workers. In each unit, the workers may be confronted with a series of incidents which they can report whenever they observe an anomaly. All the observations made by the workers, are studied by a committee, in order to derive from them measures to improve the working conditions.

In addition, the workers can also find an explanation in the different departments of the risks that each machine can present during the performance of the job so that the personnel are warned about the risks to which they can be exposed.

The company is proud of the effectiveness of its accident-prevention method together with the quality that guarantees the best results at work. The company has a senior technician, trained in quality issues and risk prevention, who is responsible for managing all safety matters in the company. This person manages prevention matters in the company, in close cooperation with the Committee for Hygiene and Health at Work in which the workers participate

The effectiveness of results

The effectiveness of the measures taken to improve on-the-job accident prevention can be demonstrated by comparing the first quarter of 2002 with that of the preceding year. The rate of on-the-job accidents decreased by more than 50% for the period observed, which is very positive and encourages the company to continue the accident-prevention work in order to further reduce the number of these accidents.

The employee involvment

This result was obtained thanks to the cooperation of all the workers of the company, who participated very actively in all of the corrective measures and in the recommendations made by the safety and health committee and integrated by the internal accident-prevention service established in the company. The workers have been made very aware. All of the workers collaborated in the work done by the members of the internal accident-prevention service.

The costs and benefits

The benefits are particularly apparent in terms of the reduction of the percentage of the number of accidents and in the involvement of all of the workers in the application of the preventive measures within the company.

The use of a dolly for moving and handling gas cylinders

Innaca sl

Industria nautica catalana sl
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E-08014 Barcelona

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E-mail: innaca@infonegocio.com
Contact person: Sra. Montserrat Font

Distribution and transport of gas containers

11 employees

During the handling and moving of gas cylinders, the back is often put under stress. Innaca, a company that processes cylinders of gas, undertook an evaluation of the risks and applied a solution to prevent overburdening the back.

The task

Innaca refills and seals (processes) CO_2 canisters, refills and seals cylinders of oxygen (surface and immersion), powder fire extinguishers, CO_2 extinguishers, and carries out industrial refilling and inspection of CO_2, halon, foam (merchant marine and industrial ships) and autonomous breathing apparatus.

The workers of the company move about a hundred small canisters daily with a weight of between 8 and 22 kg. These cylinders are moved manually a dozen meters from the painting shop to the place where they are refilled. The canisters are small and difficult to handle. This repeated moving of the canisters is done by all the workers of the company at one time or another.

To move the larger canisters, the workers use special trolleys and pallet trucks but, for these small canisters, the company did not have a suitable handling device.

To do their work, all the workers have safety shoes and gloves and receive appropriate training for this task.

The risk

The moving and manual handling of these gas cylinders requires disproportionate effort on the part of the workers, causes lumbago, and involves a risk of the canisters falling on their feet.

The solution and methodology

The company undertook a risk evaluation. The method used was the Mari or binary method, as published by the Generalitat de Catalunya, which is designed specifically for SMEs. This procedure consists of two different parts: first, the identification of the risks in a job where one or more risks have been detected and the evaluation of these risks. This evaluation is done on the basis of a binary system according to the gravity and the probability of the risk. Then, the preventive actions and the corrective measures to be adopted are defined and planned.

The workers were informed of, and trained with regard to, the risks associated with the activity and the measures judged appropriate by the management were implemented. The workers clearly saw the need to avoid the continued effort which particularly strains the back and they themselves proposed a solution.

A worker designed and made a little dolly, which turned out to be the solution adopted. It was a very simple but useful small dolly in which the canister is easily placed without any manipulation or lifting. It enables the canister to be moved and placed at its final destination without risk.

"The policy and the objectives of the company are in agreement with Law 31/1995 on the prevention of professional risks. The management of the company is committed to eliminating or reducing the risks that can affect the health and safety of workers and to promoting accident prevention and protection against risks in all of the posts and the activities of the company.

In accord with Article 10 of Decree 39/1997 and the initial risk evaluation, the company is committed to designating several workers to carry out this evaluation, with the exception of accident prevention which will be done by an autonomous accident prevention agency."

The effectiveness of results

The use of the little dolly was introduced in April 2001. Before this time, there were 5 to 6 cases of lumbago in the company. The workers who suffered from it were absent from work for five weeks and were unable to perform this task. Since this dolly was introduced, there have not been any cases of lumbago or of disproportionate effort.

The employee involvment

The participation of the workers was total. Indeed, this good practice was devised by one of them. The workers immediately saw the little dolly as a tool and a means of protecting their health and safety.

The costs and benefits

The costs of the little dolly are minimal, as it was manufactured in house and only amounted to 25 euros apiece.
The benefits obtained by the company since the installation of this transport system for canisters are numerous: the end of absences due to lumbago, a feeling of satisfaction on the part of the workers for having been able to participate directly in their safety, an end to complaints, and an improvement in the organization of the work.

More information

Generalitat de Catalunya
www.gencat.es

Recovery tub for the accidental spillage of perchloroethylene

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Chemical laundry

3 employees

One of the risks that can arise in laundries is the accidental spillage of perchloroethylene. The small cleaning company, Penalba, has fitted a recovery tub to the dry cleaner in order to recover any overspills of solvent.

The task

Penalba is a small dry-cleaning firm. During dry-cleaning, solvents are used to remove grease more easily, without mechanical operations or reheating. Dry-cleaning companies, such as Penalba, mostly use perchloroethylene (PER). The classic technology uses about 60 g of solvent per kilogram of textiles cleaned.

The risk

The dry-cleaning companies are often small firms in which the workers are exposed daily to contact with dangerous chemicals such as perchloroethylene. This substance can cause cancer but the exposure values are less than the limit values during dry cleaning and therefore do not represent a danger.
The problem lies rather in the waste created by the dry-cleaning process which is 10% to 80% of solvents (depending on the efficiency of the distillation method). Moreover, there is a risk (albeit low) of spillage of the solvent and of contamination of the floor below.

Another risk factor is the inadequate filtering of fumes during the dry-cleaning process and the risk of intoxication due to the inhalation of solvent fumes. If the fumes are not sufficiently purified, they reach the outside atmosphere, contribute to the formation of summer smog, and risk contaminating the ozone layer through the emission of corrosive chemical fumes. As small dry-cleaning firms are often located in residential areas (as is the case for Penalba) there is a risk involved for the surrounding area. Finally, there is also a risk relating to slips.

The solution and methodology

After evaluating the risks, Penalba laundry decided to reduce the risk of accidental perchloroethylene spillage. This risk assessment used the methodology developed by the Institut National de Sécurité et d'Hygiène au Travail and is based on a binary method ('seriousness' and 'likelihood').

The solution consists of the installation of a recovery tub in the lower part of the cleaning machine to collect the perchloroethylene in case the solvent is accidentally spilled. This recovery tub is made of steel covered with antioxidant paint and exceeds the perimeter of the dry-cleaner by 20cm. It can contain 70 litres of solvent, and the pump of the cleaning machine sucks up the spilt liquid.

Moreover, a protective grill was installed on the protruding part to avoid the risk of injury.
The manager of Penalba also decided to place the containers of liquids used in the dry cleaning on the protective grill that covers the tub so that any spill from one of the containers flows directly into the tub reservoir.

"The entrepreneur has always demonstrated his concern for assuring the health and safety of his workers as well as his own. This concern is expressed in the total dedication of the entrepreneur to his company and his efforts to anticipate the standards in place at national level
The entrepreneur sought information on his own initiative and put in place measures and new preventive techniques inspired by other Member States of the European Union which are more advanced in this sector and which have more stringent laws."

The effectiveness of results

Since this tub was installed, no accidental spillage has occurred. Controlled spillage was caused in order to check the effectiveness of the installed recovery system. The test result was positive: the tub recovered all the liquid that ran out.

This tub must always be kept perfectly dry. Any trace of liquid would be a sign of a failure of the safety system of the machine and would mean that a loss of perchloroethylene had occurred.

The employee involvment

The workers did not participate in the development of the idea or in the installation of this solution. The workers were informed afterwards of the objective of the installation of the recovery tub. They expressed satisfaction with the concern of their employer for their health and safety.

The costs and benefits

The installation of the tub cost 2,223.74 Euros. This investment has already borne fruit, as the profits have increased considerably. Indeed, the customers have noted the constant concern of the company with regard to innovation and the use of cutting-edge technology of the sector to improve its service, particularly regarding quality.

The benefits have not only been economic. The reputation and the competitiveness of the company have increased greatly with respect to the companies of the locality in which the dry cleaner's is situated. The customers continue to place their confidence in this little company, which has been serving the Horta quarter for some thirty years.

Back disorders and contamination in a beauty parlour

L'Institut, Centre de soins esthétiques

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Beauty farm
3 employees

Back disorders are a common complaint in beauty parlours. The risks of contamination and the transmission of diseases should not be ignored either. Centre de Soins Esthétiques adopted various solutions to deal with these problems.

The task

The work carried out in a beauty parlour (massages, body care, hair removal) frequently requires leaning over customers who are lying on a massage table or an aesthetic chair for hair removal or facial or body treatment. Beauticians work in close proximity to clients' faces and frequently come into contact with their skin.

The job consists of repetitive work, 8 hours a day.

The risk

Two major kinds of risk can be said to exist:
risks involving cervical or back disorders due to leaning;
risks involving contamination from blood, germs, and skin diseases transmitted through skin contact or via the air.

The solution and methodology

The extended absence from work of a colleague suffering from lumbago, followed by a therapeutic "recovery" period of working part-time, led to planning problems and a loss in profits. To solve this, the enterprise purchased a sit/stand ergonomic chair and additional mattresses to raise the height of the massage tables.

In addition, the use of disposable gloves and masks was recommended for certain treatments in order to prevent contamination via the air or through skin contact.

"The business has committed itself to improving working conditions and to preventing hazards to the health and safety of its employees (with their consent and participation). What has been done, has been done for the interest of the company and the people who work there".

The effectiveness of results

The measures taken by the company put an end to their problems with lumbago and contamination.

The solutions were not very expensive and could be implemented by any company within the same sector.

The employee involvment

Employees were involved from the start in looking for solutions and in the thought process. The measures were implemented following a meeting with the employees.

The costs and benefits

Since the company implemented the solutions, the beauticians have not had to take time off work for these problems. Similarly, the disappearance of back troubles means that they are more available for the customers. The solutions implemented have broadly contributed to an improvement in service. They have also improved the working relations between colleagues. This is because within a small structure the absence of an employee inevitably leads to an increased workload for the others.

Preventing back disorders in a beauty centre

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Beauty farm

Back disorders occur frequently in beauty centres. The Institut Saint-Laurent decided to take steps to reduce the risk of back disorders.

The task

Beauty work (massages, body care, hair removal etc.) necessitates leaning forward to take care of customers lying on massage tables or beauty chairs for hair removal or facial or body care.

The work is repetitive and humdrum, and the working day varies from 8 to 10 hours.

The risk

Performing massages on working tables that are too low results in a poor working posture. The beautician has constantly to stoop and bend down. When she gets tired of bending forward, she moves into a position which is straighter but further away from the client, causing eye strain.

Two main risks stand out:

- *a risk of lumbago*
- *a risk of eye strain*

The solution and methodology

Following an increase in problems linked to backache (back muscle fatigue at the end of the day, chronic lumbago, surgery, the dismissal of an employee for back trouble etc.) a risk assessment was carried out.

It was decided to raise the operating table, by adding 20cm to the feet of the initial working table. In addition, a chair with hydraulics was bought and installed in the operating theatre.

"The business has committed itself to improving working conditions and to preventing hazards to the health and safety of its employees (with their consent and participation). What has been done, has been done for the interest of the company and the people who work there".

The effectiveness of results

The solution enabled a considerable reduction in the risk of lumbago through an improved working posture.

This low-cost solution is perfectly transferable to all beauty centres.

The employee involvment

Working meetings and discussions with employees were organised in order to work together to investigate solutions. Following this, the solutions discovered were put into practice.

The costs and benefits

Since the solutions were implemented - the improvement of workplace comfort and the reduction of back muscle fatigue - a significant reduction in the rate of absenteeism has been observed. In addition, beauticians are more dynamic and more efficient and the service has been improved. The economic profitability of the Institut has increased at practically no expense.

Installation of storage racks and a modified trailer

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Joinery
21 employees

In the wood sector, the risks of lumbago and musculoskeletal problems are significant. Charpente Couverture decided to take measures to reduce these risks.

The task

The tasks dealt with in this example are those of storage, handling, and transport of carpentry components.

The risk

Poor storage increases the risk of the stacks falling over. Moreover, the space required and the weight of the objects can damage the muscles and joints as well as causing lumbago due to bad posture and the great physical effort required to handle them.

The solution and methodology

The initiative taken at Charpente Couverture had two principal objectives: first, to reduce the risks and improve the working conditions and, second, to improve the organization of the work sites. To this end, a pragmatic approach was adopted following identification of the problem and internal consideration.

The chosen solution consists of storing and wrapping carpentry elements for the work site on modified supports called racks. These racks are then loaded on a specially adapted trailer and placed in each work area by means of a lifting device.

This solution has resulted in a positive change in the work organization by rationalizing the preparatory phase of the work site. The risks of the stacks falling over have been eliminated as well as the risks associated with carrying heavy loads.

The application of this solution can be transferred to companies with similar kinds of work sites.

For our company, safety cannot be dealt with outside of the general organization of production. This avoids then the need to alter the operation of the company and permits better application of safety instructions, which are better understood.

The effectiveness of results

The risks are reduced as much as possible in this phase of the work.

The employee involvment

The organization was done internally and the employees were involved in the implementation of a solution.

The costs and benefits

The solution has improved the working conditions and reduced the arduous nature of certain tasks and the risks associated with handling heavy loads. The organization of the work has also been improved.

Handling of wooden panels

Menuiserie Thienot Jacky

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Joinery
4 employees

The storage of components in the workshop and their handling involves a number of actions which can result in lumbar pain. In his carpentry shop, Jacky Thienot developed a solution for handling panels.

The task

In a joinery like Jacky Thienot's, many actions have to be performed which can often become painful. In this enterprise, large and heavy wood panels have to be moved regularly.

The risk

The size and weight of the panels can result in lumbar pain and damage to the joints and muscles.

The solution and methodology

An evaluation of the risks was made on the basis of a tool (auto-diagnostic grid) developed in collaboration with the employers' federation and the Organisme Professionnel de Prévention du Bâtiment et des Travaux Publics (OPPBTP). The various risks (transporting loads) were the object of more in-depth examination in order to develop a solution appropriate to the activity of the firm and to the layout of the rooms.

The solution was introduced by the manager of the firm and consists of a fixed lifting system installed in the storage areas and the shop for the transport of wood panels. This support can be tilted to handle the panels. The six fixing points enable them to be tilted in different ways to facilitate diagonal passage through small openings.

This system can also be used on-site and allows the panels to pass diagonally through small openings. The lifting apparatus ensures adequate functioning of this system.

Entrepreneur's Testimony

"Working myself in the shop, I am very much aware of the issues of prevention and of health and safety. The regulations are often complex and not easy to understand for small craft companies.

The solution implemented is based on common sense and responds to an immediate and concrete issue, i.e. the reduction of risks associated with handling heavy loads."

The effectiveness of results

This solution considerably reduces the risks associated with handling and enables heavy panels to be handled by a single person. The adjustable support reduces the manual carrying of heavy loads and also reduces the risk that the transported panels will fall.

The solution is transferable depending on the layout of the rooms or working areas and so has to be adapted in each case.

The employee involvment

The solution was designed and implemented by the manager of the company but was readily adopted by the workers.

The costs and benefits

This solution contributes to an improvement of the working conditions and the organisation of the production and storage of panels. All of these constitute benefits for the company.

More information

OPPBTP (Organisme Professionnel de Prévention du Bâtiment et des Travaux Publics)
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Development of a set of safety measures

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Wholesale trade

34 employees

During the loading and unloading of materials (merchandise) and their being moved by means of elevators and cranes, the risks are numerous and various. Boscolo Bielo thus developed safety measures on several levels to protect against the risk of accidents.

The task

Boscolo Bielo is active in the wholesale commercial sector for construction materials (transport of merchandise) and has developed safety measures on several levels: the wholesale of construction materials, the correct use of elevators and cranes, the loading onto and unloading of materials from boats used for interior lagoon transport (Venice).

The more specific tasks requiring accident-prevention measures are the following:

- the worker responsible for loading the boats;
- the worker in charge of storing the materials;
- the worker on the boat in charge of loading and unloading the materials.

The risk

The most frequent risks are mainly of accidents for the workers on the quai caused by the criss-crossing of activities on the worksite.

Different risk factors in the execution of these tasks were identified:
In relation to the type of task: risks of accidents and bruising, scrapes, cuts (slices), and scratches for the quai workers and those who work on the boats and who are in charge of stowing the merchandise.
In relation to the intensity of the task: the repeated lifting of heavy loads can injure the joints, cause damage in the dorso-lumbar region (lumbago), and result in strains and/or tearing of the muscles.
In relation to the working conditions: for those who work on the boats, the risk of accidents arises not only from the movement of loads that are too heavy but from the precarious balance of the boat due to wave motion.

To these must also be added other risk factors such as bad weather conditions (ice, rain in winter, heat in summer) can cause accidents (slipping, falls from heights, etc.).

The solution and methodology

The employer, with the cooperation of the advisors of the professional organization, Confartigianato, conducted an evaluation of the risks associated with the activity using a specific checklist adapted to the realities of this activity sector. In particular, a detailed analysis was made of the accidents of the previous years. With the participation of the workers, the causes of these accidents were sought. The safety measures include a very precise delineation of the routes frequented by the transportation machines moving the loads and by the workers. As a result, it was necessary to reorganize the placing of materials on the worksite and to create obligatory routes for the transportation machines. The foreman of the worksite sees to it that the routes and the speed limits are respected and that the operations are performed correctly. Other safety measures were implemented for the loading and unloading of the material on the boats and on the methods for stowing these boats. One of the fundamental points of the adopted solution was the training programme for the workers in charge of loading the boats. This training provided a detailed description of the risks associated with the job and all the accident-prevention measures to be adopted in the loading and unloading operations.

A special training program was developed for the workers who run the lifting equipment and for those who manually move the loads. The strategies implemented did not involve substantial changes or the introduction of new individual protection equipment but rather the introduction of a 'management' of safety with a view to improving the organization of the activity. To complete the picture, special procedures have also been provided for workers of other companies who come into contact with this company.

"An accident in our company not only involves a loss in economic terms but also has a great impact on the relationship between the employer and the workers by creating a negative atmosphere. If one also adds the negative effects on the brand image and the inevitable impact on the community, it is obvious that a policy of good management of safety and health and of accident prevention in the company is fundamental.

Entrepreneur's Testimony

The effectiveness of results

The solution adopted can be easily transferred to other companies, particularly those in the construction sector that frequently use transporting and lifting machines for loads and, in particular, on worksites where the space is limited and where there is an overlapping of routes taken by the machines and the workers. Although the measures applied did not eliminate all of the risks, they did reduce them. The reduced number of accidents incurred after the application of these safety measures testify to this.

The employee involvment

The participation of the workers and their contribution to the implementation of the solution was fundamental. In particular, the contributions of each worker to the logistical solutions and the detailed description of their work certainly helped towards the attainment of the objectives.

The costs and benefits

- Reduction of the number of accidents following the application of the safety measures in the first year alone: 56%;
- Reduction of the in 59% rate of absenteeism
- Significant reduction in the number of complaints;
- Improvement of the work organization: improvement as regards the storage of the material and the loading of the customers' boats;
- Improvement in the quality of the products: greater speed in the execution of the jobs by the workers thus improved the product flow.

Preventing the emission of harmful chemical substances

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Metalworking
15 employees

During the chrome plating and polishing of metals, acid emissions are released. To reduce the risk of inhalation, Cromatura Cassanese installed extractor hoods above the chroming tanks as well as in the area used for polishing the metals.

The task

Cromatura Cassanese is a company that galvanizes and finishes metals for its customers.

The task focused upon more specifically is that of the worker responsible for chrome plating the items.

The risk

The worker charged with chrome plating the metal items was affected by the emissions of potentially carcinogenic chemicals coming from the chrome-plating baths.

The solution and methodology

An analysis of the risks was conducted with an external accident-prevention service. The risk was identified following an audit conducted by a specialized technician with the aid of checklists specific to the chemical industry.
To eliminate the risk from prolonged exposure to potentially carcinogenic chemical agents, the company replaced the existing production line, which could no longer be modified and updated, with a new galvanization installation. This new installation not only allows several processes to be amalgamated into one single operation but also has an extractor hood installed above the chrome-plating baths. This action clearly reduced the daily exposure of employees to chemical agents produced during the chrome-plating process. Futhermore, with the collaboration of an occupational health practitioner and suppliers,

less dangerous substitution chemicals have been sought.

In addition to this collective protection, the employees have received appropriate individual protection equipment. Moreover, the medical checks of the employees have been increased as well as the diagnostic examinations. Finally, the company organized an awareness raising, information, and training campaign for the employees on the use and handling of dangerous chemical compounds.

The effectiveness of results

Although it is impossible to completely eliminate all risk in a high-risk activity like chrome plating, it is still possible to reduce it considerably by applying the measures described above.

The work done to improve the working conditions in the company can be transferred to other companies in the sector.

The employee involvment

The employees have been closely involved in the analysis and the evaluation of the risk. According to the manager, this participation was facilitated by the fact that it was a small family enterprise in which the average age is low and in which the level of education of the workers is appropriate to the tasks. It was not difficult for the workers to adopt the new measures - measures which could have constituted real obstacles for others in the course of their daily work. The workers were informed at meetings which took place in the presence of the risk-evaluation technician and of the occupational health practitioner. At the end of each meeting, the participants received a vade mecum that summarized all the subjects dealt with.

The costs and benefits

The solution has reduced the number of sick days and the complaints. It has also allowed for an improvement of the organization of the work, the communication procedures, and the quality of the products.

Safer woodworking machines

Guerrini e Bardelli

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Joinery
13 employees

T use of woodworking machines carries a significant risk of cuts or of being caught by the machine. Guerrini e Bardelli conducted a risk analysis which resulted in improvements to the protection systems of the machines.

The task

In small carpentry shops, the workers undertake almost all the tasks except those for which special qualifications and training are required. Among other things, specific machines are used for the production of frames.

The risk

The machines and tools used to make frames expose the workers to risks of lesions by cutting or as a result of being caught by the machine. This risk, which is serious, is linked specifically to the activity, and the damage in the case of accidents, at equal probability, is also very high.

The solution and methodology

The solution implemented resulted directly from the analysis of the risks and from general protection principles. After identification of the danger and risk zones of the machines, the necessary protection systems for these machines were identified. The discussions with the employees directly involved were considered the reference point for the implementation of the solutions.
The method used to identify the risk factors was integrated in the risk-evaluation document. The evaluation method used concerned the inspection of the machines by comparing the good technique norms with a particular reference to the norms provided by the directive on the machines.

The previous safety systems, in place since their manufacture, were replaced by more adequate devices that could be used without interfering in the work (which was often a matter of discussion with the employees). These solutions were illustrated

during the frequent training courses and at each meeting with all of the staff. In particular, the services of the technician and the collaboration with the organization Federimpresa (the local professional association of the craftsmen) enabled the proposed solutions to be actually implemented.

"The principal objective of our company is to reduce the number of accidents so that the employees can work "calmly" with the assurance that their safety is actually being taken into consideration."

The effectiveness of results

The risks have reduced, partly because access to the danger zones was restricted or prohibited.

The adopted solutions can be applied to other organization of the same sector.

The employee involvment

The workers were involved both in the analysis and evaluation of the risks and in the implementation of the solutions.

The costs and benefits

At present, it is not yet possible to establish a reduction in the number of accidents. The exact figure will only be identifiable in three years.
The communication and the relations among the workers have been improved. Greater collaboration has been established among the workers as regards safety procedures in the workplace adopted by the company, particularly because the consultant and the managers involved the employees in the internal meetings.

Collection and precipitation of dust from the grinding of metal coffee makers fabricated by casting aluminum alloys

Nicomax

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Metalworking

16 employees

The aluminum dust generated during the grinding of metal coffee-makers presents a risk of explosion caused by sparks or an increase in temperature. The Nicomax company has installed a new piece of equipment to collect, convey, and precipitate these dust particles.

The task

Nicomax s.n.c. grinds the bodies of coffee makers manufactured by the casting of aluminum alloys. The term "grinding" refers to the operation of surface-finishing carried out with a band, the surface of which is covered with abrasive particles fixed with an adhesive. Manually loaded automatic machines perform this operation. It produces aluminum dust of varying sizes, depending particularly on the kind of abrasive used and of the precision of the grinding. The dust consists essentially of "corkscrew" shavings of between 100 µ and a few µ in size (the latter particles being almost invisible). The dust particles are collected at the point of emission by means of aspiration equipment that directs the device to a system for central precipitation.

Depending on the lot to be processed (1 to 8 cup coffee makers), a specialized operator adjusts the machine mechanically and electronically by programming the PLC in accordance with the operation to be performed.

The operator loads and unloads the item. The machine automatically performs all the movements and commands. The machines have been designed and manufactured to minimize man-machine interaction and, particularly, to eliminate all contact between the operator and the abrasive product.

The risk

These operations emit aluminum dust which, dispersed in the atmosphere, forms mixtures that can explode in the presence of sparks or increases in the surrounding temperature. The capture of the dust particles at the point of formation as well as their conveyance and collection is done by means of special dry and wet operations. During the wet treatment phase, particular attention must be given to the elimination of hydrogen, which forms by a reaction of the aluminum dust with water.

The solution and methodology

The first risk evaluation was done in 1996. This evaluation led to the replacement of the existing dust-collection installation which involved a dry process, with an installation that used a wet process. The latter installation was constructed with the technical assistance of the Health and Safety Agency of Azienda Sanitaria Locale (local sanitary agency).

In 1999, an explosion caused by a construction defect of the cyclone destroyed the installation, injured 11 workers and inflicted considerable damage on the nearby structures of the firm. After this accident, a number of solutions were sought but without full information on the literature or Italian norms concerning the issue.

The analysis was made of the risks of fire and explosion making use of the indications given in American and German regulations and the control lists prepared by a research group of the technological institute in Turin. This method resulted in the preparation and publication of a manual by the Health and Safety Agency of the ASL (Azienda Sanitaria Locale) 14 of Verbania.

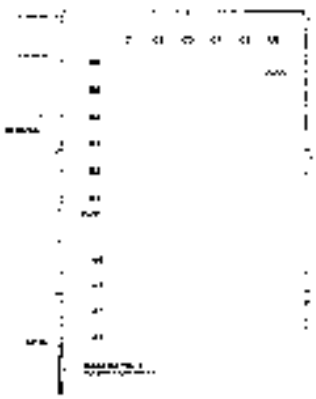
This installation starts with containers which tightly enclose the operational units, leaving room only for the space strictly necessary for the introduction of the item to be ground. The mixture of air and dust is sucked off at the base of the containers and conveyed by circular tubes of continuously increasing diameter to the washing dome with a Venturi inlet, where it is thoroughly mixed with water jets agitated by the presence of the Venturi cone before it goes into the separator cyclone. The wet and weighed-down dust particles settle in the hopper of the cyclone while the cleansed water, sucked to the upper part of the same cyclone by the ventilator is dispersed into the atmosphere by means of a chimney of suitable height. Via the hopper of the cyclone, the sediment descends into a water-filled tank, settles on the bottom, and is scraped together by a scraper. It is then collected in a vessel provided for this purpose and finally transported for disposal. In order to make the air-aluminum dust mixture more inert, each suction collector has, in its inlet, an ad hoc device that blows in calcium carbonate powder at intervals of a few minutes. This operation is shown on Diagram A1.

Diagram A1

The complete installation, including the operational units, has an EC certificate of conformity with an NFPA 651/98 extension issued by the manufacturer.

All the components of the operational units in contact with aluminum dust are clad in aluminum or an anti-static material across the evacuator inlet situated in the lower part of the housing. There is grid to keep out foreign bodies, which might generate sparks. Each machine is connected to the main collector (or by group of machines) with a vertical pipe of anti-static

Diagram A2



stainless steel with junctions assembled according to the flow. The initial segment consists of a flexible corrugated tube of antistatic synthetic material with smooth internal walls and also protected against the accumulation of static electricity by copper wire connected to conductive elements in the vicinity.

The three principal collectors of galvanized steel have a slightly sub-horizontal position, an increasing cross-sectional diameter, and terminate in the dome of the washing group with a Venturi inlet. The connections are end-to-end or simply assembled in the direction of flow (to avoid possible infiltration of water into the outer segment), and the elbows consist of clamped segments that are smooth on the inside in order to prevent the deposition of aluminum dust, the possibility of which is also reduced by the velocity of the fluid and the presence of calcium carbonate powder. The calcium carbonate is blown in at irregular intervals by the propulsion unit placed in the inlet of each collector and settles first on small irregularities that may be present. The highest points of the collectors have evacuation ports, which are always open, to disperse into the atmosphere the hydrogen molecules that may form when the equipment is shut down, in the presence of condensation. To maintain the aluminum dust safely in suspension, the velocity cannot be less than 20 m/sec, which makes the uniflow assembly of the pipes acceptable and which assists the elimination of water infiltrations relative to the possibility of dust-deposit formation (suggestion of the American norm NFPA 651). However, this is improbable because of the agitation of the flow.

The mixture of air and aluminum dust and calcium carbonate goes from the collector dome to the Venturi cone at the summit of which it is mixed, by means of agitation, with recycled water pumped from the final sedimentation tank.

This contact, at the passage in the Venturi inlet, is intensified in order to assure adhesion of the liquid to the particles to be precipitated. The depression due to the Venturi effect, also causes partial evaporation of the water, which, by recondensing in the collection and routing chamber, situated below, enhances the collection of the particles that are smaller than the dust. The summit of the dome has an open port for evacuation into the atmosphere of any hydrogen molecules, and the Venturi cone has a trapdoor for inspection and periodical manual cleaning. The shape of the collection and routing chamber is designed so that the washing group can be emptied if the installation should shut down.

From the collection chamber, the air-water-dust mixture is introduced at tangents into the separator cyclone, and the liquid fraction, centred around the walls, collects in the conical base, and falls into the final sedimentation vessel via the submerged outlet.
The atmospheric portion, cleansed, is evacuated by the ventilator at the end and conveyed into the atmosphere by a chimney equipped with a unified sampling system. The separator cyclone is also equipped with a port, which is always open, for evacuation of the hydrogen and a trapdoor for inspection and manual cleaning.

The sedimentation vessel has a large capacity (about 10 m^2) and at its bottom the sediment from the cyclone settles. It has a scraper that operates at fixed intervals to extract the sediment that is being deposited and load it into an adjacent open container, where it is ready to be taken for disposal.

The vessel is connected to the water supply system, and the refilling, which is necessary because of the consumption of water by the process, is done automatically by means of a float mechanism. The water level, maximum or minimum, is read by sensors connected to the electric command and control panel of the

system that stop the process and turn on visual and audio alarms.

If the float refilling mechanism does not function correctly, in addition to stopping the process and turning on the alarms, a system evacuates the overflow and shifts the excess liquid into an auxiliary receptacle. In the upper part of the vessel is a labyrinthine baffle chamber. From this chamber, the purified water is pumped and sent to the Venturi washing group via a hydraulic circuit of which the interception devices, normally blocked in open position, can be activated manually in the event of an emergency. A pressure-sensitive switch and a flow switch, linked to the electric command and control panel, enable the system to be stopped and the visual and audio alarms systems to be activated in the event of a dysfunction.

The centrifuge-type ventilator (90 kW and 34,000 m^2/h) is located at the end of the installation and has antivibration joints at the level of the evacuation and the routing as well as a set of vanes for the evacuation controlled by a pneumatic servocontroller connected to the star/triangle device of the motor switch.

The power supply of the operational units and of the dust-sedimentation equipment is done at IP 55.

"We are a craft company in which the workers and the proprieters work in close contact. Our safety and that of our collaborators and of the nearby companies, is our most valuable possession. The possibility of continuing in complete safety an activity that has for decades constituted something typical of the local industrial sector, is for us a source of pride".

Entrepreneur's Testimony

The effectiveness of results

The risk of explosion and fire has been fairly well eliminated.
The solution developed by Nicomax s.n.c. has been made available to other companies in the sector in the Province of Verbania. In some cases, this solution could be applied while, in others, because of the diversity in the working methods, technical or economic studies in function of the interested companies are still in progress.

The employee involvment

The workers of Nicomax s.n.c participated actively in the implementation of this example of good practice and adopted the procedures included in a text that describes and analyzes the risks associated with the equipment, methods, and the precautions. They use them to perform the operations of the enterprise in complete safety.

The costs and benefits

The study and its implementation resulted in a financial cost of about 500,000 euros for the company. The advantages reside principally in the resumption of the activities of the company, which had closed its doors for about a year, and in the possibility of paying wages to the 15 workers of the company.

Certificate for the Beauticians' Code

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Beauty farm
3 employees

Risks of lumbar pain and contamination are just some of the hazards facing beauticians. The Simone Beauty Institute has decided to give its entire work-force training on the Beauticians' Code.

The task

The primary tasks of the staff of the Simone Beauty Institute consist of an extensive range of care treatments for the face and the body. The beauticians also administer very specific care such as the treatment of acne vulgaris and acne rosacea, electrical or laser depilation, disguising of scars and other blemishes, massage to improve the circulation, and so on. The beautician provides these treatments standing or sitting but most often bent forward.

The ongoing contact with customers who have come to be cared for and beautified, requires an ability not only to perform the care but also to adapt constantly to the different personalities encountered among the clients. The beautician has to look good, to be constantly smiling and in a good mood, to be available for the clients, and to listen to them. It is a profession which makes great demands on the physical and psychological resistance of workers.

The risk

Like most beauty institutes, we discern two kinds of major hazards: first, there are ergonomic hazards, e.g. backache and/or pulling a muscle due to poor posture, eye strain due to extended concentration, and neck pain. There may also be problems with veins because of extended periods of standing. The work particularly requires use of the dorsolumbar spine and the upper limbs, and the treatment tables (often non-adjustable) do not improve the situation. In addition, there are risks of contamination (the chance of contracting a contagious disease, for example) which could occur when blood or pus runs from a client's cut.
Moreover, other risks can arise in a beauty parlour, such as the risks of allergic or irritation dermatitis from the products used for certain treatment and from the repeated washing of hands. There is also the physical discomfort that can be caused by too high a temperature, a lack of ventilation, and high humidity. Another problem arises because the beautician often works in small, dark, and windowless rooms (with no opening to the outside) and because the working hours are frequently long and variable, and breaks are not fixed.

The solution and methodology

An analysis of the key points (checklist) was carried out with the help of the employees. The checklist of the Beautician's Code served as the model. The risks of lumbar pain and contamination were demonstrated, and solutions were sought to eliminate these risks.

To counter back and neck pain, the Institute opted for treatment chairs/tables that could be adjusted in height using an electrical system.

Moreover, all the beauticians attended a training course on the Beautician's Code at 'Anbos' (a Dutch organisation representing the interests of beauticians). This Code represents the standard in this sector with regard to quality of employment, hygiene, working conditions and the environment, as well as practice, training, and management.

The specialised treatments are now administered in the way recommended in the Beautician's Code.

All the employees of the Institute have also been vaccinated against the contraction of Hepatitis B.

"Our enterprise/beauty salon is characterised by the fact that we work according to the Beautician's Code. This is a mark of quality in safety, health, and the environment, both for the staff and for the clients."

Entrepreneur's Testimony

The effectiveness of results

Since the acquisition of the new treatment tables, the employees have had fewer instances of backache. All the beauty parlours should perform a 'key-point' analysis, take the training course on the Code, and work according to its rules, and lastly obtain a certificate.

The costs and benefits

The costs and benefits are difficult to gauge and assess in statistical terms. However, it can be said that investing in training and equipment has had a positive effect on working conditions, customer contact, and the general image of the beauty parlour.

Molift Patient Lifter

Abberley House Nursing Home

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Nursing home
23 employees

Consistent heavy manual lifting of patients causes many carers to suffer from musculoskeletal disorders. The nursing home Abberley House invested in a Molift patient lifter in order to prevent back strain injuries to members of staff.

The task

Abberley House is a nursing home looking after patients suffering from either Alzheimer's or Parkinsons disease or simply old age. Owing to the nature of these illnesses, depending on the stage of development, walking is either very difficult or impossible for these patients.

Carers therefore have to assist the patients in everyday activities such as getting out of and into bed in the morning and evening, toileting, feeding etc. These tasks require the carer to move and handle the patient in a way that causes discomfort to both carer and patient.

The carer is subjected to repeated heavy lifting in the natural activities of providing full care. They regularly work for as much as 12 hours a day, with scheduled toileting, feeding etc.

The risk

Repeated heavy lifting causes damage to muscles and joints. Manual handling injuries are part of a wider family of musculoskeletal problems. They are often caused by poor working conditions: awkward or static posture; high levels of strain; frequent repetition; difficult manual handling tasks; excessive bending, stretching or effort. The back, neck shoulders and upper limbs are particularly at risk. A combination of the above means musculoskeletal disorders are increasingly a reality in service industries such as the care home sector.

The solution and methodology

In line with the recommendations issued by the Royal College of Nursing and the National Back Pain Association, Abberley House recognises that the manual lifting of patients causes back injuries and therefore has a 'no-lifting' policy in operation; the patients needing more than minimal assistance are moved using mechanical aid.

Risk Assessments are carried out for all residents within 24 hours of admission. This involves assessing not only the resident but also the task, the individual, the load and the environment. Below is a typical risk assessment form from Abberley House. As you can see they have identified: the hazard and the people at risk; whether the risk is adequately controlled; what further actions are necessary to control the risk; and then they have given the hazard a priority.

Example of a typical risk assessment form on manual handling

Exemple d'un formulaire d'évaluation type des risques dus à la manutention manuelle

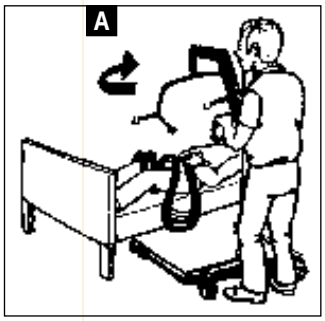
Hazard	Who might be harmed?	Is the risk adequately controlled?	Priority	What further action is necessary to control the risk?
Task (Manual Handling) • Twisting • Stooping • Excessive lifting • Strenuous pushing and pulling • Positioning • Large vertical movement • Unpredictable movement • Repetitive handling	Carer and patient	No	A	Use electric hoist to lift patient
Load (Patient) • Heavy, bulky. • Difficult to grasp • Unstable or unpredictable	Patient	No	A	Use electric hoist to lift patient
Environment (Bed, chair, toilet, floor..etc) • Constraints on floor • Variations in levels	Carer and patient	No	A	Use electric hoist to lift patient
Individual (Carer) • Require unusual capability • Is the carer pregnant?	Carer	No	A	Use electric hoist to lift patient

Priority
A – Immediate Action
B – Medium Term
C – Low level

The risk assessment form above applies to the everyday lifting activities involved in providing complete care for the patient. This involves lifting the patient to and from bed, transferring patient from one chair to another (e.g. wheel-chair), bathing, toileting and walking.

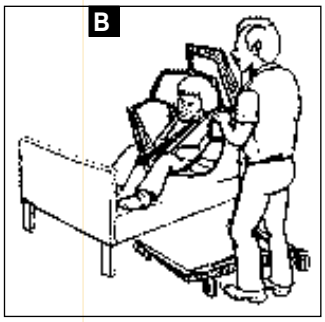
As you can see the risk assessment has prioritised the above activities as an 'A' rating hazard. This means immediate action is necessary owing to the potential seriousness of the injury to the carer and patient when carrying out either of these activities. To eliminate this risk, Abberley House use a mechanical aid to lift the patients which is called the Molift patient lifter. The Molifter lifts the patient to and from the bed, allows for transfer from chair or wheel chair, bathing and toileting. This device eliminates the carer from repetitive heavy lifting in the general care activities.

1

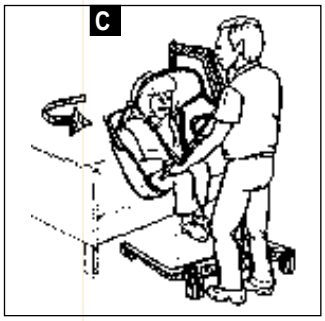


Lifting from Bed

A – The Molifter is rolled under the bed locating the sling over the patient. The sling must be centred over the patient before lifting.



B – The four hoops located on the sling are hooked onto the lift itself, with the carer raising the patient slowly.



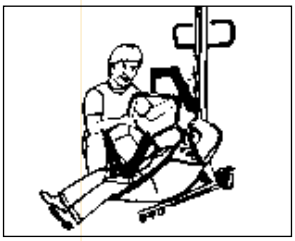
C – The carer lifts the patient until the patient is hovering above the bed. The patients legs are lifted and turned so s/he faces the lifting column. The patient can then be easily manoeuvred into a wheelchair, chair (see fig 7).

See figures 1 to 7 overleaf.

Risk assessments are reviewed monthly or sooner if patient conditions alters. Staff are given training on the use of the hoist within six weeks of commencing employment and do not work using the hoist until they have been trained.

Figures 1 to 7 above describe how the Molifter assists both the carer and patient in the natural activities of providing complete care. The design of the Molifter means that the risks identified in the risk assessment under the heading 'task' (e.g. manual handling) have been eliminated. The list of hazards identified in manual handling has been dramatically reduced and in some cases eliminated. For example, the carer does not need to stoop, perform excessive lifting, strenuous pushing and pulling etc.

2



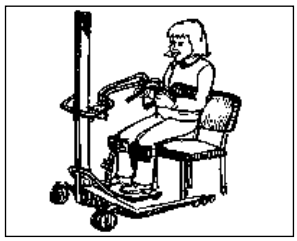
Lifting from floor

The lifter is positioned behind the patient with a pillow over the base to support the user's head and neck. Again the sling and lifter should be positioned over the centre of the patient.

The sling is then lowered and the four hooks are attached to the lift.

Lift the patient up above the floor. Position the patient using the handle on the back of the sling. Again the patient can be easily manoeuvred into a chair (see fig 7).

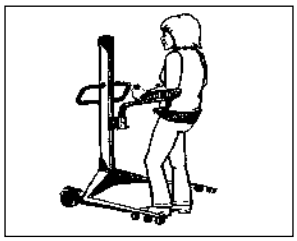
3



Lifting from chair

The lifter arms are lowered to chest height. The feet of the patient are placed on the platform of the lifter and is lifted forward until the knee support is in contact with the patients upper shins just below the knees (The knee supports are adjustable in height and width).

6



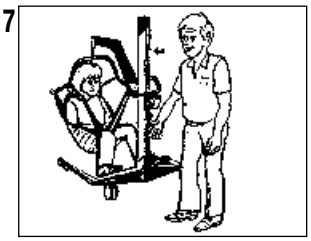
Assisting the patient to walk

The Molift lifter can also be used as a walking aid.

The patient is lifted into a standing position using the sling.

The walker provides the user with good and comfortable support and is appropriate for people with some strength in arms and legs.

7



Transferring patients in the lifter

When either lifting a patient from bed or of the floor (figs 1 and 2 above) the patient is fully suspended in a comfortable position for the patient to be transferred.

When identifying the hazards under 'load' (patient) in the risk assessment, the weight, bulk, instability and unpredictability factors have either been dramatically reduced or eliminated. The Molifter will lift a patient easily, with stability, and in a predictable manner.

With regard to identifying the hazards under 'environment' the Molifter can create new hazard types, following risk assessment . For example the Molifter rests upon castors, which do not run so easily on carpet. There are also variations in floor level which can render the Molifter useless due to imbalances. Where the Molifter cannot be used because of the environment, Abberley House will use manual handling. However, the nature and environment of the nursing home means that this is kept to a minimal level.

With regard to the carer, all risks identified in the risk assessment have been eliminated due to the Molifter lifting the patient.

"As an employer, in terms of the law and good practice, we are responsible for providing safe and healthy working conditions, equipment and systems of work for all our employees, contractors, visitors and others. This policy and its implementation will be kept up to date, particularly as we change, improve or add to our systems of work or arrangements. Any amendments will be brought to the attention of all employees. As a framework for this, the content of the policy and the way in which it has operated will be reviewed regularly (at least once a year)."

Entrepreneur's Testimony

The effectiveness of results

The Molift patient lifter has proven extremely effective in tackling the problem of back pain caused by repetitive manual handling of patients. When speaking to the carers about their day-to-day lifting activities, they explained that in addition to bulk and load being problems, they also faced problems relating to unpredictability. For example, a patient who can bear some weight on their legs (although limited) may be assisted manually by two carers on either side. If the patient feels they cannot walk anymore their legs will give way exerting an instant extreme pressure on the spines of the carers as they try to keep the patient upright.

The above case is only one example of how the Molift patient lifter eliminates these problems. As mentioned earlier the Molifter will lift a patient easily with stability in a predictable manner.

If we refer back to the risk assessment form the Molifter addresses all of the hazards identified.

The employee involvment

Staff are given training on the use of the hoist within six weeks of commencing employment and do not use the hoist until they have been trained.

Staff are given training on Manual Handling on an annual basis. It is obligatory for the staff to attend these sessions.

Building Site Orientation training and Colour-Coding

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Construction

The task

On a building site there may be many workers of various trades and contractors working for different contractors. There was no means of identifying which staff worked for which contractor and whether they were trained and authorised to be in certain areas of the site.

The risk

The specific site orientation training was often not provided for contractors or authorised visitors on sites. It was also found to be difficult to identify who had actually received the training due to the turnover of workers employed by specialist contractors, who often replace staff on site at short notice due, for example, to sickness or absence, in order to comply with their contractual obligations.

The solution and methodology

A practical system was needed to improve control and co-ordination of contractors engaged to carry out building work, in order to control accidents and comply with construction site safety regulations - in particular to control access to sites and ensure that everyone on site had received training.

Each person has to participate in the site orientation training, prior to being allowed access to the site. The training includes the use of a colour-coding system. This is enables the identification of which people have received the training and are authorised to be on site. Following the site orientation training each

person/group is required to wear their specific colour-coded tag while on site and return them each time they leave the site. The colour-coded tags identify and distinguish each contractor and group of trade persons. The colour-coded tags are also numbered to denote the name, trade and designation of each worker and visitor to each site. In this way they indicate which areas of the site a person may enter. This provides the site manager with a system that is simple to operate. Visual inspections by site management can be used to quickly spot any workers or visitors who are in areas of the site where they are not authorised to be. The colour-coded system also helps the site supervisor to ensure the completion of certain work activities before others start which can be important for safety, as the coding allows them to check in which building operations are taking place.

The effectiveness of results

The colour-coding system has proved to be very successful. It is simple to set up and manage and requires a minimum amount of paperwork. It has resulted in a reduction in number and severity of accidents and a reduction in damage to plant and equipment. During 1996, 92 056 hours were worked on construction projects without a loss of time through accidents. It has assisted the improvement of the safety culture by demonstrating management's commitment to good health and safety practices. This has also helped to improve industrial relations and staff morale. The system also facilitates the management of site security as unauthorised persons on site are recognisable due to their lack of colour-coded identification tags.

The employee involvment

Each person has to participate in the site orientation training, prior to being allowed access to the site. The site orientation training packages were developed by the organisation's occupational health and safety service and are based on the specific risk assessments for each site. Supervisors must receive training and instruction in the delivery of such training. A documentation system records who has received training.

Preventing Falls of Roof Carpenters

Oxford Safety Components

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Construction - Carpenter

The task

Sloping timber framed house roofs are constructed from a series of timber 'A' frame trusses. The frames are hoisted into position by crane and then nailed together with cross bracing in order to make a strong, resistant structure.

The risk

The problem concerns the question of how to safeguard carpenters from falls. These falls occur from inside the roof space down into the interior of the house – possibly several storeys. Before the frames are properly braced they are extremely flexible. The carpenters are standing on a series of narrow, wobbly rafters. They may have to climb up through the rafter system to remove crane hooks, or fix higher level braces in the roof space.

Safety harnesses are impractical as carpenters have to move around inside the frames in order to fix the bracing. Safety netting and other catching devices can help to avoid serious injuries but they do not eliminate the actual fall and carpenters can hit the rafters on the way down. The outcome of a fall can be death or serious injury.

The solution and methodology

Two roof carpenters who wanted to find a solution to this hazard in their work looked into the situation. They came up with the idea of using a trellis system of aluminium safety mats, spread progressively on top of the rafters, to create a working surface as the rafter trusses are put in place.

The trellis system needed to be quick to install and flexible to fit different types and sizes of roof. The solution is an expanding aluminium safety trellis system of mats or temporary decking. These mats are spread on top of the rafters as the rafter trusses are spread and placed in position.

The effectiveness of results

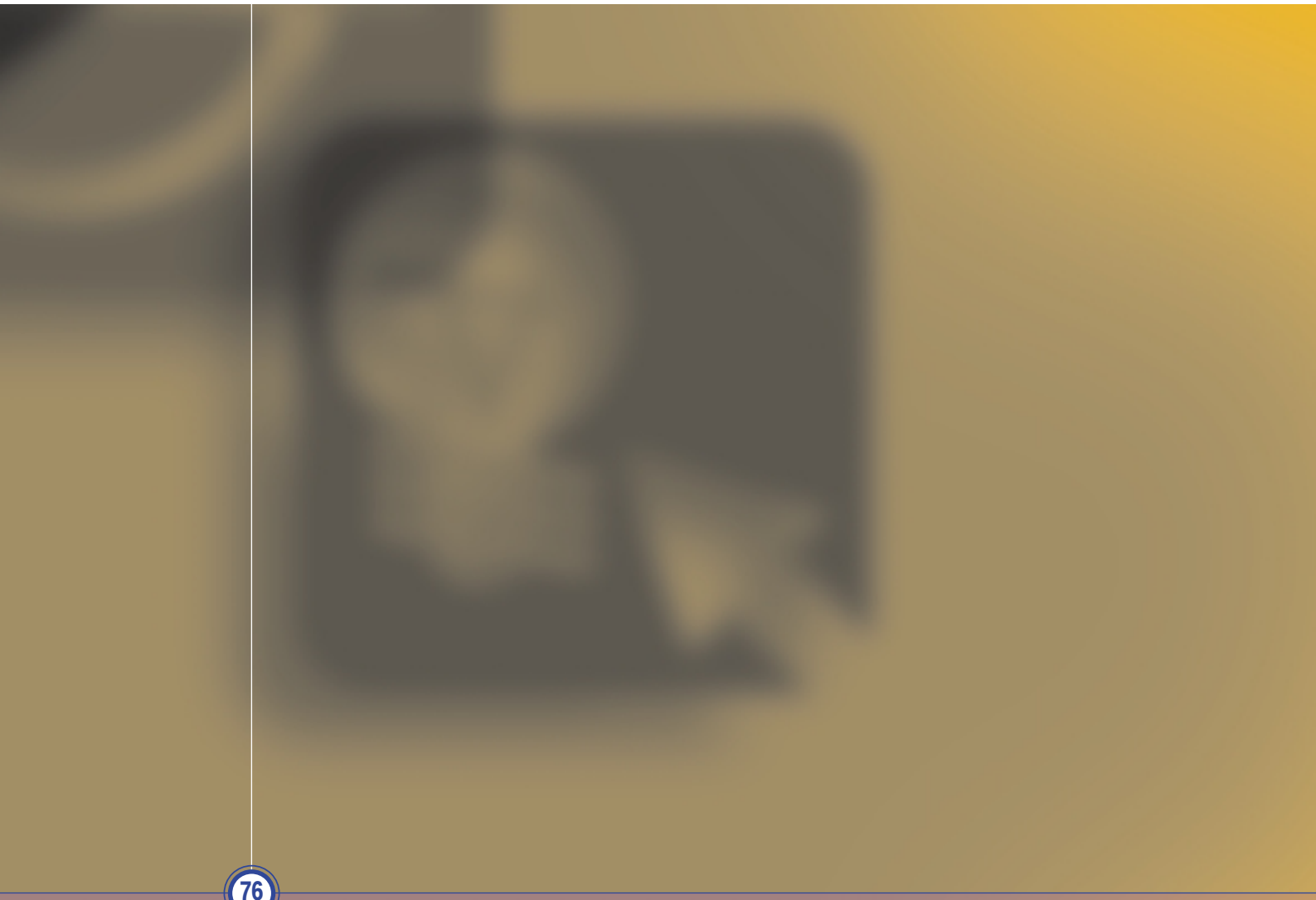
The mats form a working deck that eliminates falls and assists the easy fitting of bracing by carpenters, as well as other roof facilities such as water tanks, plumbing connections, etc. It allows operators to see what they are standing on. It is light and folds away into a compact unit for hoisting up to roofs and for storage. It is also strong and weather proof.

This mat system fits any type of roof and avoids any falls. It increases the productivity of the carpentry work, since carpenters can see what they are standing on and can move about the temporary platform more easily. The cost of use is compensated by the improved productivity.

The employee involvment

Although the trellis system is easy and safe for roof carpenters to install and move, all employees are given full training before use.

6. *Appendix*



Partners of the 'Preventisme' project

The "Preventisme - Prevention of accidents in SMEs" project was conducted by UEAPME under the leadership of Liliane Volozinskis and with the assistance of experts Véronique De Broeck and Bénédicte Godfraind from PREVENT - Institute for Prevention, Protection and Welfare at Work -.

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The 'Preventisme' project is the result of the participation of the organisations listed above.
All these organisations provide tools, check-lists, methods, etc. to help develop a prevention policy for industrial accidents and diseases in small enterprises.

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