WELDING FUME TEAM

HAZARD INFORMATION PACK

This learning information package is intended to help provide health and safety information specifically on respiratory matters, to those that are involved in the welding processes.

2014

WELDING FUME

ARC WELD AND CUTTING FUME HAZARDS

Evidence Pack

Introduction

This Welding Fume Hazard Information Pack can be used to support the employer in the process of developing and confirming the competency of apprentices or trainees.

The pack includes information that can be used to provide a basic understanding of the topic; however the candidate should also source information from other relevant providers.

Competence

Competence is the ability to do a job to a good standard of quality, to do it safely and in a reasonable time frame.

Assessment

Assessment is the process of obtaining evidence and making a judgement about the evidence. Evidence is needed to prove competence, the assessor/mentor will discuss with you the most appropriate ways for you to gather evidence to be included in your pack.

The assessment process will often identify training needs and these should be discussed with the assessor/mentor to ensure the appropriate topics are covered before re assessment takes place.

Witnesses

A witness can be nominated through mutual agreement between the candidate, assessor/mentor and nominated witness. The witness should have a good understanding of the task and be able to give constructive guidance and feedback if necessary.

Evidence

The pack is a convenient way for your evidence to be collected and presented to the assessor/mentor. Any supporting paperwork can be referenced and kept in a folder or document case.

The evidence should be selected carefully so as not to become unmanageable. The pack should be well organised so it can easily be read and understood.

One piece of evidence can be used to meet several requirements; therefore multiple copies of the same evidence will not be needed for different sections of the pack.

As a guide evidence can include:

- Description of the role/job
- Work sheets
- Written reports on performance
- Practical demonstrations of a task
- Certificates of training
- Witness testimonies

Authenticating the evidence
Wherever possible the evidence you produce should be witnessed, this could be by your assessor/mentor, supervisor or a nominated witness. This is to ensure the work offered as evidence was carried out by the candidate.

Candidate Details

Your assessor/mentors may need to refer to this page while reading your pack.

Information for registration purposes

Your surname:	Date you started this pack:
Your first name:	
Any other name:	
Your date of birth:	

Information for contacting you if necessary

Your assessor/mentor name:
Your organisation:
Your position or job:
Your Work address:
Your work contact telephone number:

Information for Certification purposes

Date you completed this pack:

How this hazard information pack works

This pack does not replace training, or learning in some other way the skills and knowledge to enable you to carry out the tasks required by the known standards. If you feel you need training in this area, please speak to your adviser before you begin this process.

This assessment pack will help you in three ways. It will:

- Tell you what you need to do or show to prove you are competent
- Give you guidance on how much evidence you need to provide
- Provide the basic records to help your assessor/mentor judge your competence.

For this section to be achieved, you will need to prove to your assessor/mentor that you can:

Identify the hazards associated with arc welding and cutting fume

and

Demonstrate good working practices to reduce exposure to the fumes

This pack will guide you through your process of evidence collection and provide useful evidence that you are competent and have performed the task to the national standards. When finished, this pack and the other documents you provide will be the evidence your assessor/mentor needs to determine your competence.

Your assessment

Your assessor/mentor is familiar with this process, and will make sure you are briefed on how to use it. Should you find any aspects of it difficult to use, or if you wish to suggest other possibilities, you should discuss these with your assessor/mentor. We believe however, that you will find this process is easy to understand and use, and with your assessor/mentor, will provide all the support you will need to succeed.

Remember do not include any documents in your collection that you or anyone else is likely to need.

An important hint

Do not try to find "something different" every time you are asked for an example. Always first consider if something you have already "introduced" to the assessor/mentor also meets the requirements of the next situation you are asked about.

Other evidence you need to provide

In performing your normal work activities, you will have used or produced a number of documents, and you will normally be able to provide copies of these.

These documents help to show that the statements you make in this pack are true and genuine, and are part of your supporting evidence. They are important to your assessor/mentor, who may not be able to observe you, and is making a decision based on the quantity and quality of all the evidence you provide. You should always refer to these documents and items in your written records in this pack, and

Make a copy of each
Number the copy
Highlight or mark the part of the document that you refer to in this pack
Put it in a sleeve
Label the sleeve with the item number
Keep the sleeve with this pack
Refer to the item by number in your entries in this pack
Send the sleeves to your assessor/mentor with the pack

But:

DO NOT copy confidential documents
DO NOT try and find a document to support absolutely everything you write
DO NOT send huge files and complete courses
DO NOT send original materials, slides, etc., that you need back quickly

Guidance for assessor/mentors

In assessing the candidate, you are assessing the evidence provided against known national or occupational standards, and not assessing their ability to complete this assessment pack. You should refer to the standard as you consider the evidence.

Remember that you have the option to discuss the details given within this pack with the candidate if you are not satisfied that the evidence presented is sufficient, valid, reliable, or attributable, so that your assessment is correct.

Guidance for candidates

You have the option to discuss the details given within this pack with the assessor/mentor and you may find more information from other sources such as the web sites listed below:

http://www.badairday.info

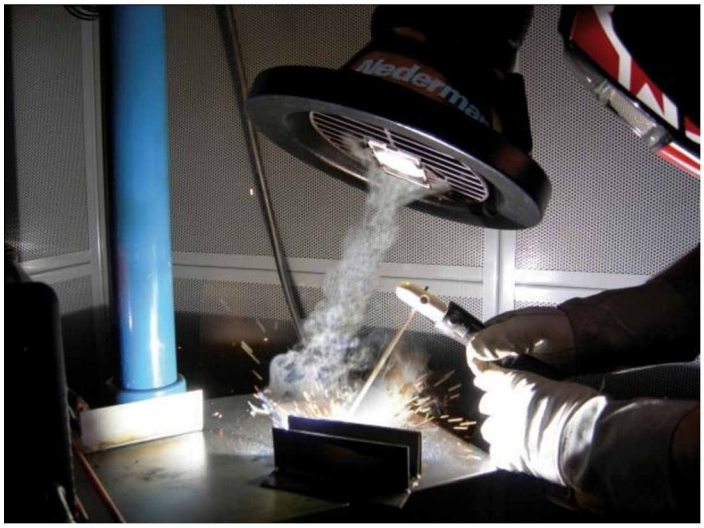
http://www.hse.gov.uk/respiratory-protective-equipment/index.htm

http://www.hse.gov.uk/pubns/guidance/wlseries.htm

http://www.hse.gov.uk/welding/index.htm

Welding and cutting fume, dust and gases

People that carry out welding and cutting have been identified as being an "at risk" group for occupational diseases arising from the exposure to dusts, gases vapours and fumes. The constituents of the fumes have a range of toxicities that, under the right conditions, can affect many parts of the body adversely. The main identified health effects are pneumonia, asthma, chronic obstructive pulmonary disease (COPD), lung cancer and metal fume fever (MFF) and lung function changes.



If you can increase your knowledge about the health hazards associated with breathing welding and cutting fumes and gases this will help you understand the appropriate protection needed. Having knowledge of welding and cutting practices and components involved in the process which may have an effect on exposure is the first step toward learning how to protect yourself from the health hazards which may exist.

REMEMBER ALWAYS CARRY OUT A RISK ASSESSMENT BEFORE STARTING ANY WORK

Risk assessment is about knowing what hazards are present in your workplace and trying to remove them or reduce the risk arising from them. Carrying out risk assessments can be complicated, requiring some specialist knowledge but in general if you follow the hierarchy of:

Remove the hazard or use a less hazardous alternative

Control the risk by physical controls

Control any remaining risk using other controls (like training and instructions)

Use Personal Protective Equipment as a general precaution and perhaps as the last level of control.

And keep your assessment in mind and under review, then you will have made a good start at a risk assessment. In most companies, your employer will need to record the significant findings of risk assessments.

What are welding and cutting fumes?

During welding and hot cutting operations (often referred to as: "hot work") emissions are produced which are collectively known as welding or cutting fume. The resultant fume generated is a complex and highly variable mixture of gases and particulates dependant upon the process, the composition of the base metal and consumable electrode, the presence of shielding gases and the temperature employed..

Some of these particles and fumes can get deep into your lungs and be deposited there instead.

Many types of metals may be found in welding and cutting fumes, including arsenic, beryllium, cadmium, chromium, cobalt, copper, iron, lead, manganese, nickel, silicates, selenium, vanadium, and zinc.

Gases commonly associated with welding and cutting are carbon dioxide, carbon monoxide, nitrogen oxides, ozone, fluorine compounds, and phosgene. These gases may be present as the result of:

- Combustion of flux shielding.
- Ultraviolet radiation interaction with shielding gases, oxygen, carbon dioxide, and solvents.
- Burning metal coatings.

As welding and cutting fume is so variable in its composition, the potential health effects that can result from inhalation exposure will also vary as a consequence. The effects of the fume can affect many parts of the body adversely, including lungs, heart, kidneys, and central nervous system.

For more detailed information please refer to the HSE website www.hse.gov.uk/welding/index.htm and related documentation.

Fume sources

The arc welding or cutting process can cause the creation of fumes, particles and gases which are dangerous to health. The air pollutants that are created can vary with the process and the consumables used. In addition the material to be welded or cut can also cause air pollution due to any contamination or coating.

The fumes created are caused by the very high temperatures of the arc causing vaporisation and oxidation of the substances present. The fume often contains micro particles which are easily passed into the respiratory system. The process selected again can have an effect on the amount and type of contaminant created.

The sources of particulate fume and gases which can be created when performing welding or cutting processes can be caused by:

- The action of the arc heat source on the parent metal to be welded or cut.
- The action of the arc heat source on any surface coating of the parent metal.

- The action of the arc heat source on the surrounding air.
- The action of the arc heat source on the consumables (filler, flux or shielding gas) .
- Engine fumes from welder/generators
- Non destructive testing materials

Surface preparation and treatment

It is often necessary to remove paint, dirt, grease, rust and scale from metal surfaces before or after commencing welding or cutting operations.

This preparation can be carried out by abrasive and chemical methods. Abrasive methods include grit and shot blasting, mechanical grinding, hand filing, and the pack use of steel wool and a wire brush. Protection for the eyes against flying particles must be provided.

Where dust is released in excessive quantities, or is toxic, local exhaust ventilation or respiratory protection will be required.

Where parent metal has a surface coating, such as galvanising, which would produce undesirable fumes if welded or cut, it may be acceptable to remove this coating by grinding, taking suitable precautions.

Chemical methods involve the use of solvents, acid, alkali, and / or detergent solutions. Solvent cleaning is carried out by means of hand swabs or by immersion of the work in tanks. Whatever materials are used for cleaning always ensure that you know what the effects on your health might be. For solvents you should check to see if they could be a fire hazard.

Degreasing operations should preferably be carried out in a workshop separated from, and non-adjacent to, the welding and cutting location. If such an arrangement is not possible the general ventilation should always be such that the direction of air flow is away from the welding or cutting area to the cleaning bay, and not vice versa.

Where tanks are used for degreasing they should be so located that air currents from doors and windows do not cause dispersal of vapours into the workshop atmosphere.

Tank covers should be used whenever possible, and work pieces should be placed into, and removed from the tank at low speed to minimise displacement of vapours.

Extraction of vapours takes place through slots along the side of the tank. All traces of the solvent should be removed from the work pieces by a sufficient period of drying, preferably by a hot air blast, before they are welded or cut. If operatives have to strip lagging from work before welding or cutting, for example from pipes, asbestos may release harmful fibres, requiring suitable protection measures.

Any work with asbestos is subject to stringent UK Regulations, with their Approved Code of Practice.

ASBESTOS blankets should not be used in heat treatment or preheating operations.

Welding and Cutting Operations

Without taking adequate precautions the operative may be exposed to concentrations of gases and fumes which are harmful to health. The most common gases and fumes produced by the welding and cutting processes are:

Metal Fumes

Exposure to metal fumes can cause a short but acute illness often referred to as "metal fume fever". This can occur when fume created by heating a metal above melting point is inhaled by the operative. The metals most likely to cause this condition are copper, magnesium and zinc but other metals can cause this problem.

Zinc is used in protective coatings on metals such as iron and steel.

Zinc oxide fume generated from welding metal with a zinc based coating is known to cause metal fume fever. Metal fume fever can be caused by breathing in welding fume from galvanised metals and mild steel.

Symptoms usually occur within four hours of exposure and include chills, fever, thirst, muscle ache, chest soreness, coughing, fatigue, nausea, and a metallic taste in the mouth. The operative may often develop a high temperature and fever conditions. These flu like symptoms may last six to 24 hours, and complete recovery without intervention occurs within 24 to 48 hours.

The normal treatment is to go to bed immediately, keep warm and drink plenty of fluids. If symptoms persist for more than 24-48 hours, you should consult a doctor. If an operative suffers from metal fume fever, the cause should be investigated and remedied.

Welding and cutting fumes also can irritate the eyes, nose, chest, and respiratory tract, causing coughing, shortness of breath, bronchitis, fluid in the lungs (pulmonary edema), and increased risk of pneumonia.

Oxides of Nitrogen

Nitrous gases (Nitrogen oxides) are formed as a result of the nitrogen and oxygen components of the air reacting with the hot weld metal and welding or cutting arc and can affect the lungs.

Ozone, Phosgene

These gases, as with the nitrous gases, can be grouped together as they produce similar harmful effects.

Ozone is colourless and is a powerful irritant gas. Exposure to excessive amounts often goes unnoticed, other than irritation of the nose and throat. However, after 24-48 hours the operative may have a severe inflammation of the lungs, where the lung

tissues become overloaded with water and the affected individual undergoes a state of asphyxiation.

If excessive exposure is suspected the operative should have absolute rest, lying down and a doctor should be consulted immediately

Phosgene gas may appear colorless or as a white to pale yellow cloud. At low concentrations, it has a pleasant odor of newly mown hay or green corn, but its odor may not be noticed by all people exposed. At high concentrations, the odor may be strong and unpleasant. Phosgene itself is nonflammable (not easily ignited and burned).

During or immediately after exposure to dangerous concentrations of phosgene, the following signs and symptoms may develop:

- Coughing
- Burning sensation in the throat and eyes
- Watery eyes
- Blurred vision
- Difficulty breathing or shortness of breath
- Nausea and vomiting
- Skin contact can result in lesions similar to those from frostbite or burns
- Following exposure to high concentrations of phosgene, a person may develop fluid in the lungs (pulmonary edema) within 2 to 6 hours

Carbon Monoxide

Carbon Monoxide is formed during MAG welding as the Carbon Dioxide content of the shield gas is atomised. The effect of the Carbon Monoxide is to prevent the absorption of oxygen into the blood stream. It will make the welder dizzy and weak, often resulting in headache and the inability to concentrate and it may lead to a state of unconsciousness.

The welder should be removed from the area to an area with fresh air. Clothing should be loosened and if necessary artificial respiration may be required. The welder should be seen by a doctor immediately.

Remember

Many substances have workplace exposure limits (WEL). These limits are used to assess whether exposure to substances is adequately controlled. Further details can be found on the HSE website www.hse.gov.uk/welding/index.htm . In addition, consumables etc. should have a material safety data sheet provided by the manufacturer which will provide details of exposure limits and how to protect against exposure.

Protection against Fume

Many workers in the UK contract occupational lung and other diseases, including cancer, each year. They develop them because they breathe in too much dust, fume or other airborne contaminants at work.

In order to reduce the effects of fumes, gases, dust and dangerous substances preventative actions are needed to avoid exposure. The control of exposure to welding and cutting fumes can usually be achieved with the help of extraction and ventilation.

The selection of the method depends on the circumstances. The aim is to remove or capture the fumes as close to the source as possible. This protects not only the operative but also other workers.

For more information about other ways of eliminating or reducing airborne contamination at work look at HSE"s COSHH website, www.hse.gov.uk/coshh/index.htm or www.hse.gov.uk/lev/index.htm

The law says you must control the risks from these types of substances (The Control of Substances Hazardous to Health (COSHH) Regulations).

By providing and using LEV it may help you to do this. However before considering these you should think about the following –

- Eliminate the source.
- Review the process
- Substitute the materials being used by something safer.
- Reduce the size of the source
- Modify the process to reduce the emission
- Reduce the number of employees involved with a process
- Apply simple controls, e.g. better natural ventilation

For more information about other ways of eliminating or reducing airborne contamination at work look at HSE"s COSHH website, www.hse.gov.uk/coshh/index.htm or www.hse.gov.uk/lev/index.htm

Working In the Open Air

In this situation the least supplementary ventilation is required to reduce any given fume hazard. In order to minimise exposure where possible the operative should position himself so that natural air current carries fume away.

Working in the Workshop

A large majority of welding and cutting operations are carried out in an enclosed workshop. Normally the workshop will be of sufficient height to allow convection effects from the welding or cutting process to carry fumes well above the head height of any personnel. There should be suitable extraction of the fume from the upper section of the workshop to prevent a layer of fume at height which may affect other workers such as crane drivers or persons working at height.

Working In Confined Work Space

When an operative is required to work in a small work space such as a welding bay or small work shop there may be obstruction to natural air flow due to partitions etc. This may prevent the fume dispersal and assist in the build up of gases that can be harmful

Sometimes an operative will have to work in a location where ventilation is severely restricted, for example, in a tank which may have only one access point just large enough to allow the operative to get in, or a long way into a large structure. In these cases local exhaust ventilation systems (LEV) is nearly always essential. In such cases, as well as fume removal to prevent asphyxiation it is always necessary to ensure a supply of breathable fresh air is provided.

The Operatives Working Position

The operatives working position alone can significantly affect exposure to fume. Naturally a welder will stand and bend over the work piece. The fume from the welding operation rises vertically and enters his breathing zone, see figure 1. Where possible if a posture can be adopted so that his head is no longer directly above the arc, or an air flow can be used to move the fumes away, see figure 2, his exposure to fumes will be much reduced.

Figure 1

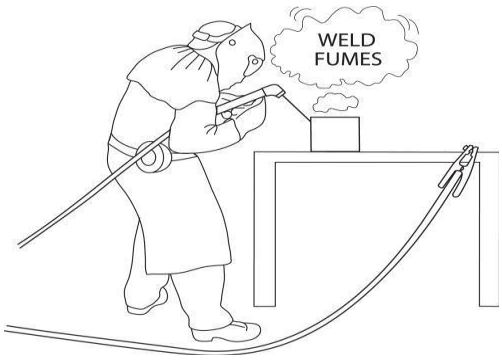
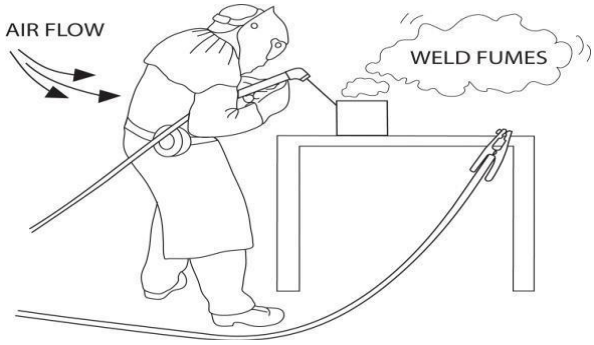


Figure 2



Extraction at Source

Extraction at source where it is a viable solution is the most efficient method of capturing and removing welding and cutting fumes. Utilising this method, the risk of the operator being subject to hazardous fumes is much reduced.

Welding torches with integrated fume extraction allow the welder to work in a wide range of scenarios such as difficult access positions in ship building where it would be difficult to get extraction arms positioned or in large fabrication areas where it is not possible to cover the area.

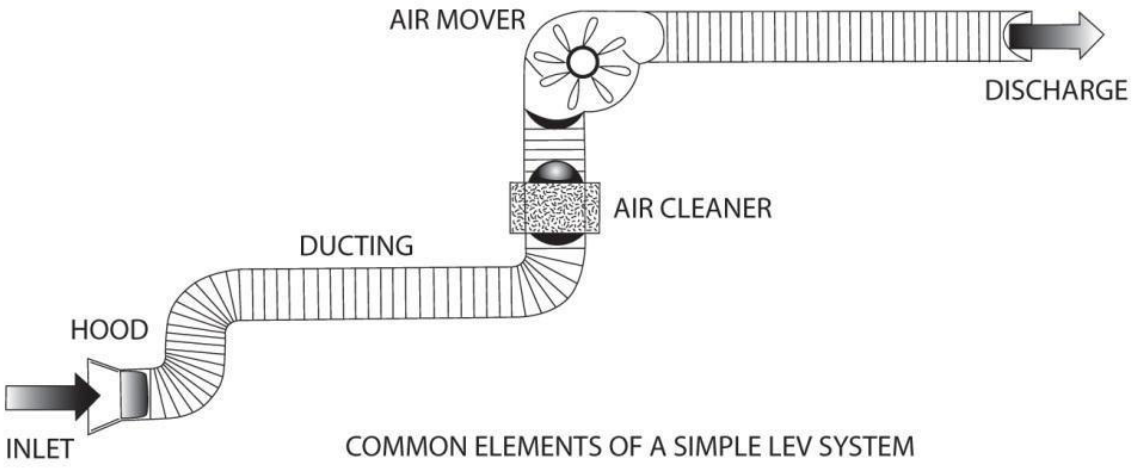
With integrated fume extraction torches the extraction is always at hand.

Local Exhaust Ventilation Systems (LEV)

LOCAL EXHAUST VENTILATION (LEV) is designed to remove airborne contaminants such as dusts, mists, gases, vapour or fumes before people breathe them in.

The typical system to remove contaminant will consist of:

- A hood(s) to collect airborne contaminants at, or near where they are created. An LEV hood may be small and built into the welding torch or it may be large to cover a significant area.
- Ducts, hoses and arms to carry the airborne contaminants away from the source.
- An air cleaner or filter box to filter and clean the extracted air. The captured air is either discharged to the outside atmosphere or filtered and re-circulated.
- A fan of the correct size to provide sufficient "suction" to the hood.
- A discharge to facilitate the safe release of cleaned, extracted air back into the atmosphere.



COMMON ELEMENTS OF A SIMPLE LEV SYSTEM

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It is quite common for LEV not to work as well as it should. A common reason is that the hood does not catch or contain the contaminants effectively. It is important to match the hood to the source that you want to control.

LEV is rarely straightforward and whilst there may be a standard, "off-the-shelf" system that would be suitable, often it will require discussions with a reputable

supplier or ventilation engineer. They can design a system that will work for you and which is "fit-for-purpose" and capable of adequately controlling exposure.

Respiratory Protective Equipment (RPE) - Fume

In many cases, the provision of engineered solutions alone cannot reduce exposure levels adequately. In such cases, it may be appropriate to use additional PPE.

What is RPE?

RPE is a type of personal protective equipment (PPE). It is designed to protect the wearer against inhaling hazardous substances in the workplace.

Each welding application may have a wide range of RPE products available from a low cost disposable respirator (mask) to a higher cost positive-pressure system.

The initial outlay cost is only one part of the equation. It is also important to consider other factors:

- Disposable respirators are cheaper but can only have limited use.
- Reusable respirators last longer but require daily maintenance and cleaning which is an additional labour cost often overlooked
- Training requirements for use and maintenance

Face fit testing each person who needs to wear a respirator with a tight fitting face piece .eg. a half face mask or a full face mask.

Adequate and suitable RPE can be described as:

- Adequate – it is right for the hazard and reduces exposure to the level required to protect the wearer's health
- Suitable – it is right for the wearer, task and environment such that the wearer can work freely and without additional risks due to RPE.

The HSE book HSG53 *Respiratory Protective Equipment at Work,* provides detailed information on the selection of RPE available, this is an over- view of the main points.

There are two main types of respiratory protective equipment:

1. Air Purifying Respirators
2. Air Supplied Breathing Apparatus

Both types of respirators have assigned protection factors (APF). The APF required to protect the wearer of the RPE from the hazardous substance is determined by the

form of the hazardous substance and its concentration in the air. Each RPE device is given an assigned protection factor (APF). A commonly used half-face welding mask will have a particulate filter with a P3 notation and this has an assigned protection factor (APF) of 20.

1. Air Purifying Respirators

There are a number of different types of filters for air purifying respirators:

- Particulate respirators filter out mechanically or thermally generated particles.
- Gas and vapour respirators filter out specific gases and vapours
- Combination filters for particulate and gas and/or vapour

Non-powered Respirator: contaminated air is drawn through the filter or filters by the wearer when they breathe in.

Powered Air Purifying Respirator: contaminated air is drawn through the filter or filters by means of a fan and delivered to the wearer's face, usually under positive pressure.

2. Air supplied Breathing Apparatus

There are three main types of air supplied breathing apparatus commonly used in workplaces, constant flow air-fed breathing apparatus, demand valve breathing apparatus and fresh air hose breathing apparatus.

Constant flow airline breathing apparatus with mask, hood (APF10-40) or hood with suit (APF200); these come in different models for light duty and heavy duty work. Constant flow means the manufacturer or user sets the air supply rate. This gives a constant flow rate at the selected air supply pressure. Air flow indicators and alarms are needed to alert users of low airflow.

Demand valve breathing apparatus has two commonly used types; demand airline breathing apparatus and self-contained demand breathing apparatus (SCBA). Both types offer an APF of 2000 if used correctly. A demand valve is designed to provide air flow as required by the wearer. It is highly specialist equipment and requires high levels of training for safe use.

There is also fresh air hose breathing apparatus which offers an APF of 40 when used with a full face mask or hood. Fresh air is drawn through a long breathing hose that is secured in a clean environment feeding into the face mask.

Welding tasks that must be carried out in a confined space will require stringent controls to be put in place and training to be given to all workers involved before the work begins. It is likely, that one of the control measures will be the requirement for all workers in the confined space to wear air supplied breathing apparatus, this requirement will be stated in the risk assessment.

Particulate Respirator

If the fumes from welding or cutting operations cannot be removed from the atmosphere before reaching the operative, an alternative is to filter them from the air that he breathes with a suitable respirator.

What is referred to as a half mask respirator can be used when welding or cutting and fits over the nose and mouth.

It comprises a filter for air entering and can have a valve which operates as the operative breathes out. There are also suitable versions which have no valve.

Air-Fed Welding Helmet

This type of welding helmet can be in two variants. One type is fed with clean filtered air via a filter pack which draws in air from the local area. The other type is fed with clean breathable air from a separate source. The helmet design should distribute the air comfortably, and will avoid any effect which might tend to draw in fume-laden air at the edges. Welder comfort is enhanced due to the cool air circulation in hot surroundings.

As with all RPE the equipment should always be suitable for the process, be used correctly and well maintained. If in any doubt it should be replaced.

Respirators (filtering devices), use filters to remove contaminants in the workplace air. Filter selection and use requires due care and attention to ensure the safety of wearers. Respirators should never be used in situations with reduced oxygen levels.

Welding/cutting: Mild steel R20/22 Health Hazard Group B Risk Rating - R20, R20/21, R20/21/22,

Welding/cutting: Stainless steel R26/28 Health Hazard Group D Risk Rating - R26, R26/27, R26/27/28,

Different types are available with a range of face-pieces: masks, hoods, helmets, visors and blouses.

- Masks are tight fitting facepieces. They rely on having a good seal with the wearer's face. To ensure a good seal, the size and shape of the mask must be matched to the wearer's face. There should not be any facial hair in the face seal region and the masks must be worn as recommended by the manufacturer. Masks will require facepiece fit testing for each wearer when selected for the first time to ensure that they are suitable.

- Hoods, helmets, visors and blouses are loose fitting facepieces. They are suitable for those who wear glasses, have facial hair or facial markings (e.g. deep scars) in the face seal region. These facepieces rely on an adequate flow of clean air being delivered to them to prevent contaminant leaking in. They are only used on fan-powered respirators and air-fed breathing apparatus.

Assess the risks presented by exposure to hazardous substances. Then identify the steps needed to adequately control the risks; put them into operation and ensure they remain effective. RPE may be one of the control measures.

If you decide to provide RPE as one of the control measures, the things you need to do are:

- Select the RPE that is right for the hazardous substance, the environment in which it is going to be used, the task and the wearer.
- Inform and train RPE users.
- Ensure RPE is maintained in accordance with the manufacturer's instruction.
- Supervise RPE wearers to ensure that they are using the RPE in accordance to manufacturer's instruction and the training provided.
- Safely dispose of damaged or used RPE and its components, taking note of waste handlers' heath and safety.

Training

All people involved in the selection, wearing, storage and maintenance (if required) must be trained. The training programme should at least cover the following areas:

- Why is RPE needed?
- What are the hazards, the risks and the effects of exposure?
- What RPE is being provided?
- How does the RPE work?
- Why fit testing is required (if relevant)
- How do you wear and check it correctly?
- Fit checking before use.
- What maintenance is required and when?
- Where and how do you clean and store it?
- How do you report any problems?
- Employee and employer responsibilities.
- Use and misuse of RPE.

Using Information

Information can be provided in many ways and in a variety of forms. In this pack you will provide examples of actual information you obtained, evaluated, recorded and stored for a variety of purposes.

Give detailed answers to the following:

Information about weld and cutting fume
How was the information presented to you? (Poster, warning label, training session, etc)

Assessor/mentor endorsement: Signature _____ Date _____

Where did the information come from? (Employer, Welding supplier, training provider, etc)
What was most interesting about the information you received?
What is the main affect that fumes will have on you?
What action/s have you taken as a result?

Explain the following:

What are welding fumes?
What is the source of welding fumes?
What effect does surface treatment have on fumes?

Give 3 examples of surface treatment removal that introduces additional hazards:
Example 1 :
Example 2 :
Example 3 :

Assessor/mentor endorsement: Signature _____ Date _____

Give details of the following:

Metal Fumes:
Oxides of Nitrogen:
Ozone, Phosgene:
Carbon Monoxide:

Assessor/mentor endorsement: Signature _____ Date _____

Explain how the following effect Ventilation and Fume Extraction:
Working in open air:
Working in the workshop:
Working in confined space:
The welders working position:

Assessor/mentor endorsement: Signature _____ Date _____

Describe the following ways to protect against fumes:
Local Exhaust Ventilation (LEV):
Personal Protective Equipment:

Assessor/mentor endorsement: Signature _____ Date _____

Health and safety Legislation
What UK Regulation requires you to use protection against fumes and what options should you consider?

Assessor/mentor endorsement: Signature _____ Date _____

Endorsement page

It is seldom possible for an assessor/mentor to fully determine from the evidence in a portfolio if a candidate consistently works within the legislative and regulatory framework that applies to them. For this purpose we ask that the managers or other persons signing these endorsements discuss them with the candidate, and satisfy themselves that the candidate consistently complies with rules in force in the performance of the tasks described in this assessment pack.

Assessor/Mentor Representative's Endorsement
The evidence produced by this candidate has been produced within the budgets set, and in accordance with the legislation as it effects this organisation
Signed Position
Date

Manager's/Company Representative's Endorsement
The candidate has consistently acted within the organisations policies on discrimination, equal opportunities, behavioural codes, and current legislation.
Signed Position
Date