South Tees Site Company

SMS 6.9.1.1 PPE Standards

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Title

PPE Standards

Summary

This document describes the relevant standards to which personal protective equipment in use at South Tees Site Company (STSC) must conform.

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Document history		
Version	**Date**	**Comment**
1.0	11/07/2014	New SSI Document
2.0	19/09/2018	Document amended for STSC

1.0 Summary

This document describes the relevant standards to which personal protective equipment (PPE) in use at South Tees Site Company (STSC) will conform. It will outline the main requirements and limitations of each category of PPE and will describe any specific considerations that need to be taken into account when selecting an item of PPE.

This supports the document MS 6.9.1 Personal Protective Equipment, which describes the management of PPE at STSC.

2.0 Head Protection - Industrial Safety Helmets

Industrial Safety Helmets are designed to protect against falling objects or impact with fixed objects.

Only one type of helmet will be supplied, which will be suitable for use in all areas of the STSC Site. The helmet will conform to the standard BS EN 397:2012. In addition to impact resistance, the helmet will offer the following categories of protection as a minimum:

440V ac	Electrical resistance to 440V ac
LD	Lateral Deformation
MM	Molten Metal
-30°C	Low temperature performance to -30°C

The helmet supplied is the Portwest PW54 Endurance Plus Visor Helmet. It is red in colour for easy identification of STSC staff and includes a chin strap. This helmet also includes a built-in retractable visor for eye protection. This visor may be used by the wearer instead of light eye protection as detailed in Section 5.1.

Visitors will be supplied with a helmet that also confirms to BS EN 397:2012 though it may not have all 4 categories of protection stated above. It will not have a retractable visor and will be white in colour to identify visitors from STSC employees.

These helmets have a maximum in-use life of 5 years. In addition, if the helmet experiences significant impact, or becomes deeply scratched, deformed or otherwise damaged then it must be replaced immediately.

Contractors supply their own safety helmets, in which case the STSC task owner and contractor will ensure that it is suitable for the activity and environment in which it is to be used.

3.0 Foot Protection

Footwear supplied by STSC will fall into one of three main types: General Safety Boot/Shoe, Foundry Boot and Wellington Boots.

3.1 General Safety Boots and Shoes

A general safety boot is available to all employees. In addition depending on the role of the employee, a safety shoe can be ordered thought they are not generally held in stock. Both the boot and shoe will conform to EN ISO 20345 and have a S3 & SRC rating.

S3 footwear has the following protective properties:

- 200 Joule steel toecap
- Anti-static sole
- Energy absorbing cushioned heel
- Penetration resistant steel midsole
- Water resistant upper

SRC - Slip resistant on ceramic tiles and steel flooring

3.2 Foundry Boots

Foundry boots are supplied to employees carrying out tasks that may involve molten metal (eg welding, burning) and require quick release of the footwear in the event of hot metal entering the boot. Foundry boots will conform to EN ISO 20349. These are designed to protect against molten iron and steel splashes and will therefore have the following specific approval:

Fe Indicates that the boot is resistant to the effects of large quantities of molten iron when tested according to the requirements of Annex A of the above standard.

Foundry boots shall also conform to the requirements of EN ISO 20345. As a minimum they will have the following approvals: S3 & SRC as described above and HI, HRO where:

HI Insulation against heat

HRO Heat resistant outsole (contact up to 300^{o}C for 60 seconds)

3.3 Wellington Boots

Wellington boots will conform to EN ISO 20345. These will be designated as S5 indicating that they have the following protective properties:

- 200 Joule steel toecap
- Anti-static sole
- Energy absorbing sole unit
- Penetration resistant steel midsole
- Cleated outsole

In addition, Wellingtons will have the following approval:

SRC Slip resistant on ceramic tiles and steel flooring

3.4 Socks

100% Cotton socks will be supplied for use with foundry boots for tasks where there is a risk of molten metal splash such as welding.

Upon contact with molten metal or flame, natural fibres such as cotton and wool will char and not leave any residues other than ash. Non-FR fibres such as polyester and nylon, as well as being combustible, leave sticky decomposition residues which can adhere to the skin and therefore increase the severity of a burn injury.

4.0 Clothing

Clothing supplied to protect against workplace hazards and the weather falls into one of 5 main categories, although there is some overlap between the standards relevant to each category:

- General Flame Retardant (FR) Workwear
- Arc Flash Protective Workwear
- Chemical Protective Workwear
- Disposable Coveralls
- High-Vis Clothing

4.1 General Flame Retardant Clothing (Two Piece Garments and Coveralls)

It is STSC policy that whenever possible employees wear the same general workwear garments. This allows for a standard appearance across the site and all employees will be dressed identically for easy identification as STSC employees. It may mean that employees are wearing garments that provide protection for hazards that they may never be exposed. However, the garments have been chosen for their general comfort so the extra protection will not provide additional hazards. Employees have the choice of two-piece (jacket and trousers) or one-piece coverall.

The standard two piece garments and coveralls will conform to EN ISO 11612:2008 'Protective clothing to protect against heat and flame'. Within this standard there are 6 categories of approval designated A to F for each of the following specific hazards:

Category	Attribute	Performance Levels
A	Limited Flame Spread	A1, A2
B	Convective Heat	B1, B2, B3
C	Radiant Heat	C1, C2, C3, C4
D	Molten Aluminium	D1, D2, D3
E	Molten Iron Splash	E1, E2, E3
F	Contact Heat	F1, F2, F3

These garments will also conform to EN ISO 11611:2007 'Protective clothing for use in welding and allied processes'. Within this standard there are two levels of approval:

Requirement	Class 1	Class 2
Impact of Spatter[1]	15 drops	25 drops
Heat Transfer (Radiation)[2]	RHTI24 > 7sec	RHTI24 > 16 sec

Note 1 Minimum number of drops of molten metal to raise the temperature behind the fabric by 40K. Material which ignites during this test will be deemed to fail.
Note 2 Measure of the radiant heat transfer through the fabric.

The minimum standard to which the STSC general FR clothing will conform is EN 11612:2008 A1 & A2, B1, C1, E2, F1 and EN 11611:2007 Class 2.

Thus these garments may be worn for welding processes that are undertaken at STSC.

The FR garments supplied by STSC are a two-piece navy and red garment with silver retro-reflective banding and a one-piece navy coverall, also with silver banding. The choice of garment is up to the individual but there are some restrictions on the one-piece coverall as described below. The red on the two-piece garment will aid identification of STSC employees from a distance.

The two-piece navy and red garments also have arc flash protection to IEC 61482-2 Class 1, EN 61482-1-2 and IEC 61482-1-1 (ATPV = 13.6 cal/cm^3). The one-piece coverall does not have any arc flash protection thus it cannot be worn by an employee carrying out tasks where arc flash has been identified as a potential hazard.

To achieve the required level of flame retardancy the fabric has been chemically impregnated. It is possible that this can wash out, especially if incorrect washing procedures are adopted. Laundering will therefore only be carried out by specialist industrial garment cleaners. Fabrics undergo FR testing after undergoing 50 wash cycles and can therefore be expected to have a minimum service life of 50 washes.

4.2 Long Sleeved Arc Flash Polo Shirt

Long sleeved arc flash FR polo shirts will be supplied to employees who carry out tasks where there is a risk from arc flash. They must be worn along with the two-piece navy and red garments whenever a task is carried out where arc flash is a potential hazard. (The navy one-piece coverall must not be worn as it does not provide any arc flash protection.)

The long sleeve polo shirt must conform to EN 61482-2 and EN 61482-1-2 (ATPV = 11.6 cal/cm^3) for arc flash protection. Combined with the navy and red jacket (ATPV = 13.6 cal/cm^3) then the total protection is thought to be sufficient for all potential arc flash issues across the site (though a full arc flash study is still to be carried out which will identify the levels of potential explosions).

In addition to arc flash protection the polo shirts must also be flame retardant to EN 11612: A1, B1, C1 & F1. Whilst not essential, these garments may also have anti-static properties, in which case they will conform to EN 1149-5.

4.3 Chemical Protective Clothing

Chemical protective clothing is difficult to specify, as the performance of any given fabric will depend on the nature of the chemical to which it comes into contact. In addition, this type of garment will be combustible. It is therefore incumbent on the user to check that the garment is suitable for the intended environment and will provide adequate protection against the substance to which it is exposed. Clothing can be obtained depending on the hazards involved in the task.

One garment is currently on the approved PPE list which is the Alpha Solway Green Chemmaster Hooded Coverall that conforms to EN 14605.

4.4 Disposable Coveralls

Disposable coveralls are available to protect employees mainly from particulates though they can protect from limited liquid splashes. If heavy liquid splashes are possible then chemical protective clothing should be worn.

The coveralls will confirm to Protective Clothing Category III, Type 5 & 6.
Type 5: Protection against fine dry particles (EN ISO 13982-1)
Type 6: Limited liquid splashes and fine sprays (EN 13034)

The garment will have an anti-static treatment applied to the inside surface of the fabric and meet the electrostatic charging performance criteria for non-homogenous materials (EN 1149-1) if properly grounded.

Whilst this garment will be combustible, it shall not continue to burn on withdrawal of the flame and shall not form molten droplets when tested to EN13274-4.

The garment that is currently stocked, and meets these requirements, is the Multi Pro 56.

4.5 High-Visibility Garments

High visibility garments will conform to the requirements of BS EN 471 'High-visibility warning clothing for professional use'.

Within this standard there are three classes of garment depending on the area of visible material incorporated in the garment. There are a further two levels of performance depending on the degree of reflectivity of the retro-reflective material applied to the garment.

Garments supplied to STSC shall conform to the following requirements:

	Garment Class	Level of Retro-reflective Material Performance
Hi-Vis Padded Jacket	3	2
Hi-Vis Waistcoat	2	2

These garments will not possess any flame retardant properties.

5.0 Eye Protection

5.1 Light Eye Protection

Light eye protection will conform to the requirements of EN 166'Personal eye protection – specifications'.

The minimum requirement will be EN 166-1-F where:

- '1' indicates the optical quality of the ocular (class 1 is the highest)
- 'F' indicates the mechanical strength of the item (High speed particles, low energy impact)

Lenses will be made from polycarbonate and at least one style that can be worn over prescription glasses will be available.

Alternatively employees may use, if they wish, the eye protection visor that is included in the industrial safety helmet currently supplied.

Prescription safety glasses are available to those employees who require them. The procedure for obtaining prescription safety glasses is controlled by the Purchasing Department. The glasses will meet standards equivalent to the standard above.

5.2 Goggles

Goggles will conform to the requirements of EN166 'Personal eye protection – specifications'.

The minimum requirement will be EN 166-1B-349 where:

- '1' indicates the optical quality of the ocular (class 1 is the highest)
- 'B' indicates the mechanical strength of the item (High speed particles, medium energy impact)
- '3' indicates that the goggle is resistant to liquid droplets
- '4' indicates that the goggle is resistant to large dust particles
- '9' indicates that the goggle is resistant to molten metals and hot solids

Goggles may also have anti-scratch (code 'K') and anti-mist (code 'N') coatings.

5.3 Face Shields

Face shields will conform to the requirements of EN 166:2001 'Personal eye protection – specifications'.

The minimum requirement will be EN 166-1B-39 where:

- '1' indicates the optical quality of the ocular (class 1 is the highest)
- 'B' indicates the mechanical strength of the item (High speed particles, medium energy impact)
- '3' indicates that the face shield is resistant to liquid splashes
- '9' indicates that the face shield is resistant to molten metals and hot solids

Several face shields will be available in a range of tint shades, including:

- Clear
- Anti-glare shade 1.7
- Green shade 5*

* Note that the green shade 5 visor only has approval for low energy impact. This would only typically be specified for oxy-fuel cutting applications.

5.4 Welding Screens and Visors

5.4.1 Welding Helmets and Handscreens

A selection of welding screens can be obtained including hand-held and head-band mounted versions.

These will conform to BS 1542:1982 Class 3. These are suitable for electric arc welding, cutting and similar processes involving direct exposure to high intensity radiation, sparks and particles of metal, together with the risk of electric arcing from tools.

A range of tinted lenses can be obtained in appropriate sizes ranging from tint shade 10 to 13. These will conform to EN 169:2003.

All screens will also be supplied with a clear polycarbonate back lens conforming to EN 166. These will be fitted to ensure that glass does not enter the eye in the event that the tinted lens breaks during use.

5.4.2 Gas Welding Goggles

Gas welding goggles will conform to BS EN 175 and the lenses will conform to EN 166 and EN169.

Lenses will be tint shade 5 and be fitted with a clear polycarbonate back lens.

These goggles are only suitable for oxy-fuel (gas) welding and oxy-fuel cutting applications.

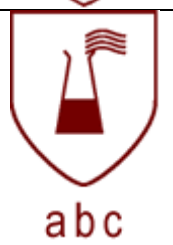
5.4.3 Auto-darkening Welding Shields

Welding shields with auto-darkening filters (ADF) can be obtained if required.

These helmets will conform to BS EN 175 and the ADFs will conform to EN 379:2003+A1:2009.

6.0 Hand Protection

There are four main standards to which hand protection will comply:

Standard	Description	Rating Levels	Symbol
BS EN 388:2003	Protective gloves against mechanical risks • Abrasion resistance (a) • Blade cut resistance (b) • Tear resistance (c) • Puncture resistance (d) (see note 2)	0-4 0-5 0-4 0-4	
BS EN 407:2004	Protective gloves against thermal risks • Burning behaviour (a) • Contact heat (b) • Convective heat (c) • Radiant heat (d) • Small splashes of molten metal (e) • Large splashes of molten metal (f)	0-4 0-4 0-4 0-4 0-4 0-4	
BS EN 374-2: 2003	Protective gloves against micro-organisms		
BS EN 374-3: 2003	Protective gloves against chemicals • Methanol (a) • Acetone (b) • Acetonitrile (c) • Dichloromethane (d) • Carbon disulphide (e) • Toluene (f) • Diethylamine (g) • Tetrahydrofurane (h) • Ethyl acetate (i) • n-Heptane (j) • Sodium hydroxide 40% (k) • Sulphuric acid 96% (l)		

Note 1: Where an item has not been tested for a particular attribute then this is denoted by an X.
Note 2: Gloves meeting the requirement for resistance to puncture may not be suitable for protection against sharply pointed objects such as hypodermic needles.

6.1 General Handling Gloves

Gloves supplied for general handling purposes will conform to EN 388. The most important attributes for this type glove are for them to have high levels of abrasion and tear resistance. Gloves will therefore be selected with high performance ratings (3 and 4) for these attributes.
Two types of gloves will be made available: heavy duty and a light weight, dexterous glove.
A typical specification will be: EN 388-4.1.3.1

The current available heavy duty gloves are leather riggers and drivers gloves which also have good puncture resistance and therefore these will comply with EN 388-3.1.3.3.

6.2 Heat Protection Gloves and Gauntlets

Gloves and gauntlets supplied for protection against heat will conform to EN 407. They will all offer a high level of protection against burning behaviour and convective heat and, where tested, molten metal splash.

Additionally, these products will have high levels of resistance to mechanical hazards, especially abrasion, tear and puncture resistance.

As the only current tasks that expose employees to heat are burning and welding, the available gloves are specific to these tasks. The available gloves are detailed below:

Product Code	Description	Standard	Comments
L5-314	Heat Resisting 14" Gauntlet	EN 407-4.1.3.1.4.4 EN 388-4.1.3.3	Preferred glove of most welders
833L	Red Welders Gauntlet	EN 407-4.1.3.1.4.4 EN 388-4.1.3.3	Can also be obtained if required

6.3 Gloves for Chemical & Micro-Organism Protection

Gloves supplied for chemical protection will conform to EN 374-3:2003.

Currently only one glove for chemical protection is on the approved list. It is the Contact Sense Disposable Nitrile Glove. These are single use gloves that can also be used for other applications (but not hot work) where dexterity of the fingers is required. These gloves also conform to EN 374-2:2003 for protection against micro-organisms.

If additional gloves are required for protection against chemicals then they will be assessed in accordance with the procedure described in MS 6.9.1 Personal Protective Equipment (PPE).

6.4 Gloves for Liquids, Oils & Greases

Gloves are available for general work in wet areas and for handling oils and greases. They are not suitable for handling chemicals.

Two types of glove are available, a wrist length glove and a gauntlet that provides protection to the lower arm. Both gloves provide protection against mechanical rick in accordance to EN388

7.0 Respiratory Protection

7.1 Disposable and Semi-Disposable Respirators

A limited range of disposable and semi-disposable respirators will be supplied. A suitable range will be stocked to cover the full range of chemical exposure hazards including: dusts, welding fume, organic vapours, inorganic gases, nuisance odours and acid gases.

Disposable respirators will conform to EN 149: and semi-disposable respirators will conform to EN405. The selection criteria for respirators will include an assessment of the suitability of the respirator for its intended purpose, wearer trials and face fit test results

Currently, only 4 respirators are stocked:

Item	Standard	Application
3M 9928	EN 149:2001 FFP2D	Premium Welding Fume Respirator (Welding fume and Ozone)
3M 8835+	EN 149:2001 FFP3D	Dust (P3 level) Welding Fume
3M 4277	EN 405:2002 FFABE1P3D	Dust (P3 level) Organic Vapour (eg Benzene) Inorganic Gases (eg Hydrogen Sulphide) Acid Gases (eg Sulphur Dioxide)
3M 9913	EN149:2001 FFP1	Steel House access only (nuisance odour, mould)

Note: These types of respirator are not suitable for protection against carbon monoxide, asphyxiant gases or oxygen depleted atmospheres.

7.2 Air-line and Self-Contained Breathing Apparatus

The selection, issue and maintenance of breathing apparatus does not fall within the scope of this document. These items do not form part of the STSC approved PPE list.

This is controlled by Energy Services and reference must be made to their systems and procedures.

However, this is the only type of respiratory protection that is suitable for use against carbon monoxide, asphyxiant gases and oxygen depleted atmospheres.

8.0 Hearing Protection

There are two types of hearing protection that are available for use at STSC:

- Ear muffs (neck-band and helmet mounted)
- Ear plugs (disposable)

8.1 Ear Muffs

A selection of ear muffs will be supplied with varying levels of noise reduction. Selection must be based on a measurement of the noise exposure followed by an assessment of the suitability of the particular ear muff. This will require advice from a competent person as it is important to achieve the correct level of protection (and not to under- or over-protect).

Two types of muff will be supplied: neck-band type and helmet mounted.

Neck-band ear muffs will comply with EN352-1 and helmet mounted muffs will comply with EN352-3.

Current models stocked have Single Noise Ratings (SNR) ranging from 26 to 35.

8.2 Disposable Ear Plugs

Disposable ear plugs will be supplied for occasional and intermittent use or for user preference over muffs.

These will comply with EN352-2.