

# **Coronavirus (COVID-19): report on Personal Protective Equipment supplies**

## **Supporting our Front Line Services and Building Self Sufficiency**

### **Ministerial foreword**



We are in the midst of an unprecedented public health and economic crisis, which we know isn't going away any time soon. Protecting staff working on the frontline is, of course, an absolute priority which is why we have been working hard to both secure additional equipment and supplies to help meet immediate demand, but also build long-term PPE manufacturing and hand sanitiser production capability in Scotland to meet future needs.

As well as rapidly identifying offers of support which could supply us with high volumes of approved PPE and sanitiser products in the fastest times, a multi-agency team (including colleagues from the NHS, Scottish Enterprise, SDI, and the National Manufacturing Institute Scotland, operated by University of Strathclyde) worked with businesses to increase Scottish capacity to make key products. This has helped to build resilience for any future crisis, and we are also moving towards self-sufficiency in many key items of PPE and sanitiser, including several new domestic supply chains established in record time.

Many Scottish businesses have diversified to support the national effort and ensure a secure supply of NHS essentials. Every one of those has played a hugely important role in ensuring we have the vital equipment and supplies we need in Scotland as we continue to tackle this devastating disease and I want to publicly thank you all for your incredible efforts.

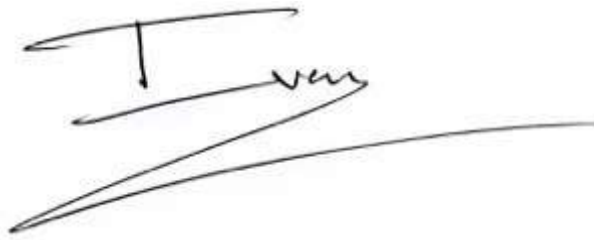
It is so encouraging to see so many Scottish businesses quickly diversifying their product lines and invest in new equipment to help us deliver what is needed, when it is needed. I am proud to see Scotland coming together in this way, using all levers at our disposal. Great things can be achieved when the public and private sectors collaborate to tackle the many challenges caused by the global COVID-19 pandemic.

This is complex work in unprecedented times and tremendous progress has been made in only a matter of weeks in meeting demand, building resilience, reshoring manufacturing activity, attracting investment, identifying new export opportunities and enhancing self-sufficiency.

I would therefore like to thank all the companies that have helped us in our efforts.

Across all items of PPE we have ensured adequate supply of stocks to our front line services throughout the crisis and our stocks remain in a good position. And across all PPE commodities we are also actively pursuing initiatives to introduce reusable items – subject to strict clinical assessment – to reduce the environmental impact of PPE products.

The rest of this document details the work done through the crisis in each commodity to ensure supply of PPE to our front line services, the current situation and the significant progress we have made towards PPE self-sufficiency.

A handwritten signature in black ink, appearing to read 'Ivan McKee', with a long horizontal flourish extending to the right.

**Ivan McKee MSP**

Minister for Trade, Investment and Innovation

## **Fluid-resistant (Type IIR) surgical masks**

### **What they are**

Surgical facemasks are medical devices covering the mouth, nose and chin, and should be worn during any activities where there is a risk of blood, body fluids, secretions or excretions splashing onto the wearer's mouth or nose. They will be used in

- cohorted area (but no patient contact), e.g. cleaning room, equipment etc.
- close patient contact (within one metre), e.g. providing patient care, home care etc.

### **What has happened since March**

Prior to COVID-19, National Services Scotland (NSS) supplied around 3 million units per year, equating to around 57,000 masks per week. Based on Health Protection Scotland guidance, the use of these masks increased significantly across health and social care in late March. The total demand for the health and social care sector is now 4.6 million masks per week, around 50% more masks are now needed in a week than were previously needed in a year.

NSS has been supplying around 3 million masks per week to the NHS and community and social care over the last 3 months, with masks being sent out to health boards each week. The demand for social care is serviced through the hubs and existing procurement routes. The total in stock is around 70 million, including local stock returns which show strong supplies with boards holding around 7 million masks locally to ensure an adequate supply at board level. All hubs hold stock of type IIR masks and there has been no stock shortage of this product in any of the hubs.

In order to meet this huge increase in demand NSS has adopted a "make" and "buy" strategy. To date, over 100 million masks have been imported, with a further 60 million to follow. At the same time Scottish manufacturers are investing in the machinery required to supply the masks, with discussions ongoing about contracts with the NHS to help develop Scottish self-sufficiency.

### **Scottish manufacturing**

Alpha Solway, based in south-west Scotland, has purchased new machines capable of making type IIR masks with production due to begin in August at their facility in Dumfries. As well as providing an increased supply of masks, this has boosted employment in the region with 30 full-time permanent members of staff hired to work at this facility. The company is using raw material sourced from Don & Low in Forfar.

Thanks to these efforts, we expect to be able to meet **all** of Scotland's demand using Scotland-based manufacturers. Scotland will also have the capacity to help supply other parts of the UK and other countries with the PPE they need.

## **Further innovation**

Surgical masks from China usually have loops which secure behind the ears. This can be uncomfortable when the masks are worn frequently. Scottish SME Protoshape Limited has addressed this problem by developing a small plastic strip which hooks onto the ear pieces of the mask improving comfort and fit. The NHS has placed an initial order for 200,000 of these devices. Where appropriate the strip can be cleaned and reused based on local assessment.

## **FFP3 masks**

### **What they are**

FFP3 masks offer a very high degree of filtration (99%). They are only required when undertaking Aerosol Generating Procedures (AGP). This is because the presence of aerosols increases the risk of virus transmission.

### **What has happened since March**

Prior to COVID-19, National Services Scotland (NSS) supplied around 52,000 units per year, equating to around 1,000 per week. Based on Health Protection Scotland guidance, the use of these masks increased significantly across health and social care in late March, with them being worn by a range of staff in various clinical and care settings. NSS is now supplying 220,000 units per week to health boards, 220 times more than was previously required.

To ensure that a broad range of face types is catered for, NHS Scotland is distributing a mix of different types of known and trusted FFP3 mask products, with strong face-fit pass rates (achieving a good contact between the wearer's skin and the face seal of the mask). This supply of a wider range of masks which are suitable for a broader range of faces has helped to improve the face-fit testing process on the front line

In total, boards are reporting that they are holding 1,700,000 units locally to ensure an adequate supply at board level. The demand for social care is serviced through the triage service. Any social care service requiring FFP3 masks will access stock in this way and there has been no stock shortage of this product for any social care services.

In order to meet this huge increase in demand NSS has adopted a "make" and "buy" strategy. Over 8 million units have been bought/imported from European and manufacturing sites in Asia.

Through our 'make' strategy, self-sufficiency in Scotland for FFP3 masks will shortly be achieved through the newly created domestic manufacturing supply chain using product from Don and Low and the manufacturing expertise of Alpha Solway.

## **Scottish manufacturing**

Backed by an order for 2 million FFP3 masks, Alpha Solway has reshored mask manufacturing from Taiwan and begun to ramp up production to 5 million masks per week – well beyond NHS Scotland’s demand, creating export potential.

To address global shortages of the raw material required in the filter layer of FFP3 masks, the Scottish Government via Scottish Enterprise has provided Forfar-based Don & Low with a £3.6 million repayable grant towards the £4.5 million purchase, import and installation of new machinery to manufacture this raw material in Scotland. This will make Don & Low one of a handful of companies in Europe capable of supplying the filter material and will both boost domestic manufacturing and supply, provide more stability in the supply chain and create export opportunities.

Thanks to these efforts, Scottish manufacturing capability will soon exceed Scottish demand providing both security of supply and export potential.

## **Further innovation**

Innovative work is underway to improve the fit of FFP masks. The National Manufacturing Institute Scotland (NMIS) team at the University of Strathclyde’s Advanced Forming Research Centre is using research and innovation with hand held 3D digital scanners to make long term improvements to the FFP mask design and manufacturing process. Samples of masks with a good face-fit pass rate have been passed on to NMIS, who are using scanning and digital fitting methods to quantify what defines a “good face-fit” for a range of faces. The first trials showing fit issues with small faces have been carried out, and a review of issues in the face fit process is underway by the NHS Innovation team.

Recognising the potential issues that the increased use of face masks could potentially cause the deaf community (around 6.7 million people in the UK) who often rely on lip reading, Edinburgh-based Maci Innovations and spin-out, Breathe Easy, is focusing on manufacturing FFP3 masks that ensure the accessibility needs of this community are met. Supported by the team at NMIS, the company is being guided through the certification process to ensure the masks meet the stringent requirements for medical environments.

In addition, a new work stream has been established looking at innovation and encouraging the development of more novel products including a sustainable solution for reusable respirator masks. Careful consideration is being given to decontamination and infection prevention and control measures. Impacts on guidance, protocols, costs, and the environment are currently being assessed.

## **Gloves**

### **What they are**

Medical gloves are disposable nitrile gloves used during medical examinations and procedures to help prevent cross-contamination between caregivers and patients.

### **What has happened since March**

Prior to COVID-19, National Services Scotland (NSS) supplied around 260 million units per year, equating to around 5 million per week. Based on Health Protection Scotland guidance, the use of these gloves increased significantly across health and social care in late March, with them being worn by a range of staff in various clinical and care settings. NSS is now supplying 11 million medical gloves per week to health boards, NHS community services and social care hubs, an increase of over 120%.

The increased demand has been successfully serviced by NSS with gloves being sent to health boards as required. All hubs hold stock and there has been no stock shortage of this product in any of the hubs.

In order to meet this huge increase in demand NSS has principally been sourcing these from the manufacturing centres in Asia as we have been unable to source these products in the UK.

At the same time Scottish Enterprise is supporting two glove manufacturers to consider Scotland as a manufacturing location as they look to begin UK production of gloves.

## **Eyewear (visors & goggles)**

### **What they are**

A face shield, or face visor, is an item of personal protective equipment that aims to protect the wearer's entire face from hazards such as potentially infectious material droplets or splashes.

Eye Shields/safety glasses/goggles are devices for protecting the eyes against exposure to liquid droplets. All safety glasses must be optically clear and be resistant to fogging.

### **What has happened since March**

Based on Health Protection Scotland guidance, the use of visors increased significantly across health and social care in late March, with them being worn by a range of staff in various clinical and care settings. NSS is now supplying 70,000 units per week to health boards. This is expected to increase in the coming weeks as demand increases.

In total, boards are reporting holding 400,000 visors locally to ensure an adequate supply at board level. The demand for social care is serviced through the hubs. All hubs hold stock and there has been no stock shortage of this product in any of the hubs.

In order to meet this huge increase in demand NSS has adopted a “make” and “buy” strategy. Five million units have been bought/imported from Asia. At the same time local and UK sourcing has been carried out with over 1.5 million units bought mostly from Scottish based manufacturers over the last few months.

For goggles, NSS has sourced these products from the far east as there is limited manufacturing capacity within the UK at this stage, with nearly 3 million units bought.

At the same time a number of Scottish SMEs are planning to supply these products in the medium term.

### **Scottish manufacturing**

After hearing of the shortage of visors for front line NHS workers, Scottish company Alpha Solway switched emphasis from making protective clothing for oil and gas industries to visors.

As this was a new product a prototype was developed before being approved for use in NHS front line. Initial production of 5,000 per week rose quickly to 20,000 per day and Alpha Solway secured a contract to produce 1.1 million in just 12 weeks.

To enable Alpha Solway to deliver this volume of visors 22 additional staff were recruited thus helping the local workforce and economy.

Thanks to these efforts, we will be able to meet **50%** of Scottish demand using Scotland-based manufacturers.

### **Further innovation**

Since March, many manufacturers have stepped up to meet the local supply of visors for their NHS Boards, Care Homes and communities across Scotland. These have included 4C Engineering and Aseptium & Lifescan (their joint efforts known as “Corran Visors” in the Highlands), Skyrora, and Baker Hughes.

Reusable goggles have been sourced from international markets and will be introduced where appropriate across the health and social care sector.

## **Aprons**

### **What they are**

A medium duty polythene apron which provides a high level of protection and hygiene.

### **What has happened since March**

Prior to COVID-19, National Services Scotland (NSS) supplied around 44,200,000 units per year, equating to around 850,000 per week. Based on Health Protection Scotland guidance, the use of aprons increased significantly across health and social care in late March, with them being worn by a range of staff in various clinical and care settings. NSS is now supplying 1,400,500 units per week to health boards for acute care, an increase of over 60%. The total demand across the health and social care sector is now 4.5 million per week, which is being met by NSS.

There are two types of apron, the highest use item is the disposable plastic apron. Reusable aprons that can be laundered have recently been approved for use where care is given to one person, therefore these have started to be rolled out to unpaid carers and personal assistants. 200,000 of these aprons have been purchased and will be rolled out over the coming weeks.

Health boards maintain good stock of aprons and all hubs hold stock and there has been no stock shortage of this product in any of the hubs.

The majority of these items have also been imported from Asia using existing supply arrangements and national contracts. Additional quantities have been procured from UK sites to supplement this increase in usage.

### **Scottish manufacturing**

Berry BPI, already a supplier to the NHS, sourced and shipped to Scotland specialist machines for the manufacture of disposable aprons from their Greenock factory. At capacity, these machines will produce 2-3 million aprons per week. This has secured 10 local jobs with an additional 60 new positions being established.

In normal times, this would have exceeded demand, but even during the outbreak, we will still be able to meet more than **40%** of Scotland's demand using Scotland-based manufacturers.



## Non-sterile gowns

### What they are

Non-Sterile Gowns or isolation gowns are used for procedures that do not require a sterile product. They are required where the users need a degree of protection above that provided by a plastic apron.

### What has happened since March

Based on Health Protection Scotland guidance, the use of these gowns increased significantly across health and social care in late March, with them being worn by a range of staff in various clinical and care settings. NSS is now supplying 50,000 units per week to health boards.

There are two type of non-sterile gown, one which can be laundered and one which is single use. The reusable gowns have been approved by Health Protection Scotland and are used in appropriate clinical settings. An initial stock purchase of 200,000 of the reusable gowns was made and this has been distributed to health boards for use.

In total, boards are reporting holding 180,000 gowns locally to ensure an adequate supply at board level. The demand for social care is serviced through the hubs. All hubs hold stock and there has been no stock shortage of this product in any of the hubs.

At the same time NSS have placed orders for 40,000 non-sterile gowns per week from the Scottish company Keela and Edmund Bell, based in the north of England, who are manufacturing gowns from material produced by Don and Low in Forfar.

### Scottish manufacturing

A new domestic supply chain has been created for non-sterile gowns. Forfar manufacturer Don and Low has repurposed production to produce material for gowns. NSS has so far ordered 2.8 million square metres of this material, which is being converted to gowns by Edmund Bell (Yorkshire) and Keela (Glenrothes), with additional support from Endura and Transcal (Livingston).

Thanks to these efforts, we will be able to meet **more than 50%** of Scotland's demand using Scotland-based manufacturers.

## **Hand sanitiser**

### **What it is**

Liquid or gel alcohol based hand sanitiser in a variety of sizes of bottles ranging from 100ml to 1 litre, with either flip-top or pump-top closures. Sanitiser is used to reduce the spread of infection.

### **What has happened since March**

Following the outbreak of COVID-19, the demand for hand sanitiser increased substantially as a result of the advice to wash and sanitise hands to help combat the spread of the virus. Prior to the outbreak consumption was approximately 2,500 litres of sanitiser per week, this increased to 20-30,000 litres per week, around 10 times greater. Total forecast demand, including non-health and social care, is 100,000 litres per week which has meant the need to procure bottled sanitiser in significant volumes for frontline services.

The Scottish Government has worked collaboratively with colleagues in Scottish Enterprise and the NHS National Services Scotland to identify sources of bulk supply of hand sanitiser. Since the outbreak of COVID-19 we have, working with industrial partners, been able to create a new supply chain for the production of hand sanitiser in Scotland. This has involved sourcing not only the raw ingredients of sanitiser but also plastic bottles, Industrial Bulk containers, shipping and packaging lines.

### **Scottish manufacturing**

Scottish chemicals company CalaChem Ltd has produced 580,000 litres of sanitiser at its site in Grangemouth, with ethanol provided by Whyte & Mackay. This has been bottled in a range of sizes by a number of Scottish companies

This work has also been helped by The Scotch Whisky Association which launched a portal connecting distillers that can produce and supply hand sanitiser and/or ethanol with organisations in need, making it easier for relevant companies to collaborate.

Work is also being undertaken by Zero Waste Scotland, NHS NSS and Trade Right International to explore the potential for a trial project for the re-use of sanitiser bottles.

## **Ventilators**

### **What they are**

A ventilator is a machine that helps patients with breathing. Given the nature of the COVID-19 disease, it was clear from the very early stages of the response that increasing the stock of ventilators was a critical task.

### **What has happened since March**

On 16 March, the UK Prime Minister issued a call to the manufacturing sector to use their expertise to help build 30,000 ventilators, launching the UK Ventilator Challenge.

The Scottish Government's NHS Supply Chain Working Group focused on mobilising Scottish manufacturing input to the UK Ventilator Challenge, and more widely to support the Scottish NHS to increase ICU ventilator supply and, where required, specific components for ventilators in shortage.

### **Scottish manufacturing**

Several businesses with Scottish bases pivoted quickly to ventilator development, responding magnificently to the UK Ventilator Challenge:

- Plexus were planning to manufacture the Helix ventilator at their site in Kelso;
- JFD Ltd in Aberdeen and Inchinnan had leveraged their expertise in breathing equipment to design a new ventilator (the InVicto Non-Invasive Ventilation machine);
- Babcock's Zephyr Plus ventilator is being supported by Plexus and Raytheon, as part of their critical supply chain. The Zephyr Plus continues to be supported by the UK Ventilator Challenge.

Recognising the international challenge posed by COVID-19, Armadilla Ltd, an eco-pod design company based in Bonnyrigg, has been successful in reaching the final of the global CoVent-19 Challenge. One of seven finalists, this continues to demonstrate the innovative capacity and capability of Scotland's manufacturing base in response to the health crisis.