

3M™ Versaflo™ Powered & Supplied Air Respirator Systems  
Selection Guide



Work  
in a World of  
Comfort





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## Introducing 3M™ Versaflo™ Respirator Systems

The 3M Versaflo Respirator Systems is a comprehensive approach to worker protection systems based on comfortable-to-wear modules. Each system has three easy-to-select modules that are compatible with one another – an air delivery unit, a headtop and a breathing

tube. The modules can be combined into dozens of system configuration. It is the ultimate in flexibility for handling changing user environments, needs, and comfort preferences.

### Advantages

**Integrated Protection:** Safety managers can configure 3M Versaflo Systems and accessories to help protect users from a variety of combined hazards.

**Flexibility:** Users can mix and match modules as they move from one environment to another, or from one application to the next.

**All-Day Comfort:** pressure on face, breathing resistance and heat build-up are greatly reduced when compared to tight-fitting facepieces.

**A Refreshing Stream of Breathable Air:** making hot environments or strenuous labour more tolerable.

**Higher User Acceptance:** increased comfort can mean that users will tend to wear the systems longer, increasing their protection time and potential productivity.

**Easy x Three:** Easy-to-select. Easy-to-use. Easy-to-maintain.

### How to use this Guide

1. Find your industry as listed in the Table of Contents on page 2.
2. Go to your industry's page and find the application that matches your job.
3. For each application, one or more combinations of headtop and air delivery unit are suggested. However, other headtops within the range may also be applicable based on user preference. Use the product information found on pages 5 through 11 to help in your selection of both headtops and air delivery units that best suit your needs. Please refer to your on-site safety specialist or industrial hygienist for advice on correct filter selection. Your local 3M dealer will then be able to provide further assistance.

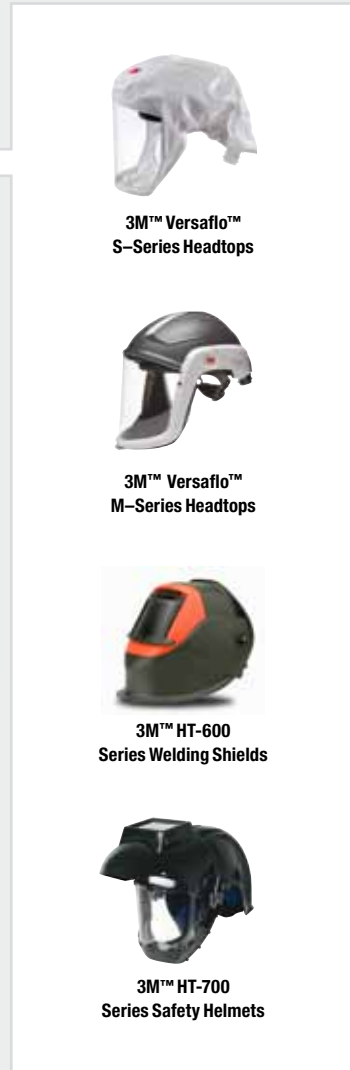
4. If your industry or application is not listed, please contact your local 3M dealer for further assistance. 3M offers an extensive range of protective equipment and it is very likely that we have a solution for you.

**Note:** This Selection Guide only covers the most common industries, applications and products. It is the responsibility of the employer to ensure correct respirator selection for the application. Final determination of respirator applicability and filter selection must be made by an on-site safety specialist or industrial hygienist. Do not use for respiratory protection against unknown atmospheric contaminants or when concentrations of contaminants are unknown or immediately dangerous to life or health (IDLH), or in atmospheres containing less than 19.5% oxygen. (This is 3M's definition; individual countries may apply their own limits on oxygen deficiency. Please seek advice if in doubt.) For further details about all 3M respiratory systems, see our full Product Catalogue.



## Four Steps to the Right Respirator

- 1 Identify the Hazards** – dusts, metal fumes, gases, vapours, impacts, noise, etc.
- 2 Assess the Risk** – assess the hazard levels against safety standards and consider additional protection, such as neck or shoulder coverage
- 3 Select the right Respirator** – Powered or Supplied Air



### 3.1 Choose your Air Delivery Unit

To handle the contaminant situation at your particular workplace, you have the choice between two powered air turbos and three supplied air regulators.\*

### 3.2 Choose your Headtop

From lightweight hoods to industrial helmets that provide not only respiratory protection, but also can provide eye and face protection, head protection, and hearing protection.

### 3.3 Choose your Breathing Tube

The breathing tube reliably connects the headtop to the air delivery unit, ensuring a constant flow of breathing air. To meet the high respiratory performance requirements, 3M™ Versaflo™ Headtops connect to their air delivery units via the new 3M™ Versaflo™ BT-Series Breathing Tubes.

### 3.4 Choose accessories (if required)

3M offers a comprehensive range of modular system accessories to make it easier to customise the system to suit individual needs. When using powered air turbos, users must also choose the right filters for the contaminant(s). For supplied air systems, 3M offers a choice of supplied air filtration units, supplied air tubes and couplings.

## 4 Train in fitting and use—to optimise your respiratory protection

This 4 step selection process can be made even easier by choosing 3M's air delivery unit starter kits which includes everything apart from your headtop.

Furthermore, many Versaflo products will be approved for use with 3M's existing modular powered and supplied air range—contact your local 3M office for details.





# 3M™ Powered Air Turbos



## 3M™ Versaflo™ TR-300 Powered Air Turbo

The all-new, lightweight 3M™ Versaflo™ TR-300 Powered Air Respirator is the key to an easy-to-use, versatile, respirator system for environments with hazardous particles.

- Protection from particles and some nuisance level\*\*\* gases and vapours.
- Slim, lightweight, balanced design.
- Controlled flow, at nominal 190 l/min.
- Easy to adjust and maintain.
- Audible and visual low airflow and low battery alarms.
- Battery charge indicator
- A window on the turbo allows instant identification of the installed filter.
- Outer surfaces are easy to clean.
- IP53 rating. Suitable for use in a decontamination shower.



### Technical Specifications

<b>Approvals</b> Respiratory protection*	EN12941 TH2/TH3
<b>Filters</b>	Particle Particle + Nuisance level organic vapour*** Particle + Nuisance level acid gas filter (and Hydrogen Fluoride, 10 x threshold limit value)***
<b>Airflow</b> Manufacturer's Minimum Design Flow (MMDF) Nominal Airflow	170 l/min 190 l/min
<b>Weight</b> (including high capacity battery, standard belt and particle filter)	1 095 g
<b>Battery</b> Operating hours** Recharging time	Li ion 5-6 hours (economy battery) 10-12 hours (high capacity battery) Less than 3 hours (economy battery) Less than 3,5 hours (high capacity battery)
<b>Belts selection</b>	1) Standard webbing 2) Coated, easy-clean 3) Heavy-duty leather
<b>Temperature range</b> Operation Storage	-10° C to + 55° C -30° C to + 50° C

\* For further information, please refer to the headtop information or contact 3M.

\*\* Run times are with new, fully-charged batteries and new filters.

\*\*\* Nuisance level refers to concentrations below the threshold limit value (TLV).

### 3M™ Versaflo™ TR-302E/TR-302UK Turbo Unit

The TR-302E turbo unit comes with a filter cover and airflow indicator only.

### 3M™ Versaflo™ TR-315E/TR-315UK Starter Kit

This 3M™ Versaflo™ TR-315E Starter Kit includes the TR-300 turbo unit, particulate filter, pre-filter, standard belt, high capacity battery pack, battery charger kit, self-adjusting breathing tube and airflow indicator.





## 3M™ Jupiter™ Powered Air Turbo

The Jupiter turbo unit provides respiratory protection against particulate and gaseous contaminants (particulate only and combined particulate/gas and vapour filters are available). Ergonomically designed to sit at the base of the user's back, the unit's low weight is carried mostly on the user's hips via the padded comfort belt. As a result, the Jupiter powered air turbo unit is comfortable enough to wear for entire work shifts. Includes decontamination belt, airflow indicator and calibration tube.

- Ergonomic comfort belt
- Audible and visual low airflow alarm
- Wide range of filters
- Easy to adjust and maintain
- Decontamination comfort belt for improved fitting and easy cleaning
- IP53 rating. Suitable for use in a decontamination shower.
- 3M™ Jupiter™ Intrinsically Safe Kit option



## 3M™ Jupiter™ Powered Air Turbo Unit

3M Jupiter turbo unit includes decontamination belt and clip, air flow indicator and calibration tube.

## 3M™ Jupiter™ Starter Kit

3M Jupiter Starter Kit (see photo) includes a standard 3M Jupiter turbo including decontamination belt and clip, filter gaskets, air flow indicator and calibration tube as well as a pair of organic vapour and particulate (A2P) filters, pre-filters, self-adjusting breathing tube, 8 hour rechargeable battery (NiMH) and battery charger.

### Technical Specifications

<b>Approvals</b> Respiratory protection*	EN12941 TH2/TH3
<b>Filters</b> Particle Filter Combined gas/particulate filter	P A2P, ABE1P, K1P, A2BEK1P
<b>Airflow</b> Maximum Airflow Manufacturer's Minimum Design Flow (MMDF)	230 l/min 150 l/min
<b>Weight</b> (including 8 hour battery, belt and particle filter)	1 471 g
<b>Battery</b> Operating hours  Recharging time	NiMH 4 hours (economy battery) 4 hours (IS battery)** 8 hours (high capacity battery) Approx. 6 hours
Belt	Decontaminable
<b>Temperature range</b> Operation Storage	-5 °C to +40 °C -10 °C to +50 °C

\* For further information, please refer to the headtop information or contact 3M.

\*\* Can be used in potentially explosive atmospheres when used with specific intrinsically safe accessories.

## 3M™ Supplied Air Delivery Units



### The 3M™ Versaflo™ V-500E Regulator

The Versaflo V-500E regulator ensures an individually-adjustable, consistently-controlled airflow. The regulator requires a working pressure of 3.5-8 bar and is extremely quiet due to the integrated silencer (<65 dBA). An integrated warning whistle warns the user of low airflow into the headtop.

- Meets latest standard (EN14594)



#### Technical Specifications

<b>Approvals</b> Respiratory protection*	EN14594
<b>Inlet Pressure</b>	Pressure range 3.5-8 bar Max Pressure: 10 bar
<b>Outlet Flow</b> Nominal flow	170-305 l/min
<b>Weight</b>	550 g
<b>Belt</b>	75 - 127 cm
<b>Couplings and connectors</b>	Available from 3M: - CEJN '342' - Rectus '25' - Broomwade 'Instantair'
<b>Compressed air supply tubes</b>	Select from: - 10m /30m standard duty - 7.5 m coiled - 10m antistatic, high temp
<b>Inlet and auxiliary port</b>	¼" BSP thread
<b>Temperature range</b> Operating Storage	-5 °C to +40 °C -10 °C to +50 °C

\* For further information, please refer to the headtop information or contact 3M.

### The 3M™ Versaflo™ V-100E Air Cooling and V-200E Air Heating Regulators

3M Versaflo V-100E and V-200E Regulators allow users to either cool (V-100E) or heat (V-200E) the air by as much as 28° C, making them a good choice for workers exposed to either uncomfortably hot or cold temperatures.



#### Technical Specifications

<b>Approvals</b> Respiratory protection*	EN14594
<b>Inlet Pressure</b>	Pressure range 4-6 bar Max Pressure: 10 bar
<b>Outlet Flow</b> Nominal flow	170-500 l/min
<b>Weight</b> (including comfort pad and belt)	605 g (V-100E) 499 g (V-200E)
<b>Belt</b>	75 - 127 cm
<b>Compressed air supply tubes</b>	Select from: - 10 m /30 m standard duty - 7.5 m coiled - 10 m antistatic, high temp
<b>Inlet port</b>	¼" BSP thread
<b>Couplings and connectors</b>	Available from 3M: - CEJN '342' - Rectus '25' - Broomwade 'Instantair'
<b>Heating/Cooling Effect</b>	Maximum of 28°C
<b>Temperature range</b> Operating Storage	-5 °C to +40 °C -10 °C to +50 °C

\* For further information, please refer to the headtop information or contact 3M.



## Integrated Suspension Headcovers and Hoods

- Ready to use straight out of the box
- Suitable for applications that require frequent replacement of the entire headtop assembly.
- Meet the highest respiratory class - EN 12941 TH3.
  - Nominal protection factor 500.
- Limited eye and face splash protection to EN 166.
- Wide faceseal with soft elastic for improved comfort and reduced noise.
- Available in two adjustable sizes: S/M and M/L.

3M™ Air Delivery Unit	Standards with S-Series Headcovers and Hoods*	NPF**
3M™ Versaflo™ TR-300	EN12941 TH3, EN166 2:F:3	500
3M™ Jupiter™	EN12941 TH3, EN166 2:F:3	500
3M™ Versaflo™ V-500E/V-200E/V-100E	EN14594 3A, EN166 2:F:3	200

\* The S-Series Headcovers and Hoods meet the lower strength (A) requirements of EN14594. They are approved for use with a range of compressed air supply tubes that meet both the lower and higher strength (A and B) requirements.

\*\* Nominal Protection Factor - a number derived from the maximum percentage of total inward leakage permitted in relevant European Standards for a given class of respiratory protective devices.



### 3M™ Versaflo™ S-133 Headcover

General purpose, cost-effective fabric.

**Fabric material:** Polypropylene coated non-woven polypropylene.

**Visor material:** PETG.



### 3M™ Versaflo™ S-333G Headcover

Soft, quiet, more durable low-linting fabric.

**Fabric material:** Polyurethane coated knitted polyamide.

**Visor material:** Coated polycarbonate for increased chemical and scratch resistance.



### 3M™ Versaflo™ S-433 Hood

Includes neck and shoulder coverage.

**Fabric material:** Polypropylene coated non-woven polypropylene.

**Visor material:** PETG.



### 3M™ Versaflo™ S-533 Hood

Neck and shoulder coverage with soft, low-linting fabric that more readily drapes over user.

**Fabric material:** Polyurethane coated knitted polyamide.

**Visor material:** Coated polycarbonate for increased chemical and scratch resistance.





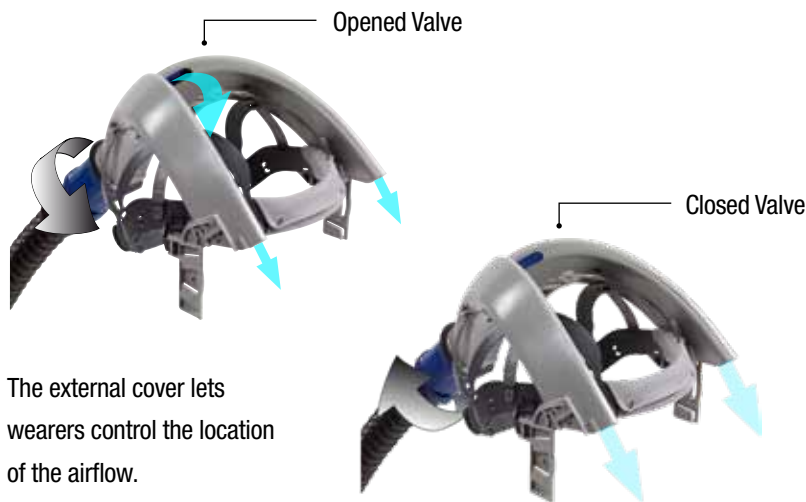
## Premium Hoods with Reusable Suspensions

- Cost effective choice for environments requiring high rates of hood disposal
- Just the soiled hood fabric is replaced, while the suspension and air ducting can be reused
- User control of airflow location
- Limited eye and face splash protection to EN 166
- Meet the highest respiratory class - EN 12941 TH3.
- Nominal protection factor 500

## Innovative Suspension with Adjustable Airflow



reddot design award  
winner 2010



The external cover lets wearers control the location of the airflow.



\* Reusable suspension hoods only.



**3M™ Versaflo™ S-655 Hood**  
General purpose, with knitted inner collar that is shorter and thinner than previous models.

**Fabric material:** Polypropylene coated non-woven polypropylene.  
**Visor material:** PETG.



**3M™ Versaflo™ S-657 Hood**  
Features a double-shroud design for its respiratory seal.

**Fabric material:** Polypropylene coated non-woven polypropylene.  
**Visor material:** PETG.



**3M™ Versaflo™ S-757 Painters Hood**  
Fabric specifically intended to help capture paint overspray.

**Fabric material:** Polypropylene coated non-woven polypropylene.  
**Visor material:** PETG.



**3M™ Versaflo™ S-855E Hood**  
Sealed seam hood for liquid chemical splash environments.

**Fabric material:** Zytron® 200.  
**Visor material:** Coated polycarbonate

Zytron® is a registered trademark of Kappler.



## Highly Versatile Rigid Headtops

All-new 3M™ Versaflo™ M-Series Headtops feature lightweight, compact and well-balanced faceshields and helmets that can offer integrated protection from a range of respiratory, head, eye and hearing hazards, with offerings for neck and shoulder coverage.

- Integrated protection from multiple hazards (e.g. respiratory, impact, splash hazards).
- M-300 and M-400 Helmets meet the highest respirator performance requirements (TH3) for this type of product when used with specific 3M Air Delivery Units.
- Modern, well balanced designs.
- Visor design combines excellent peripheral and downward vision with good optical clarity.
- A deflector allows users to direct the airflow inside the headtop for increased control and comfort.
- Coated lenses provide chemical and scratch resistance.
- Spare parts and accessories are quick, easy and intuitive to replace.
- Offerings for hearing protection available separately.

3M™ Air Delivery Unit	3M™ Versaflo™ M-100		3M™ Versaflo™ M-300		3M™ Versaflo™ M-400 Series	
	Standards	NPF***	Standards	NPF***	Standards	NPF***
3M™ Versaflo™ TR-300	EN12941 TH2, EN166 1:B:3 EN352-3****	50	EN12941 TH3, EN166 1:B:3, EN397** LD 440 V a.c. EN352-3****	500	EN12941 TH3, EN166 1:B:3, EN397** LD 440 V a.c.	500
3M™ Jupiter™	EN12941 TH2, EN166 1:B:3 EN352-3****	50	EN12941 TH2, EN166 1:B:3, EN397** LD 440 V a.c. EN352-3****	50	EN12941 TH3, EN166 1:B:3, EN397** LD 440 V a.c.	500
3M™ Versaflo™ V-500E/ V-200E/ V-100E	EN14594 2B*, EN166 1:B:3 EN352-3****	50	EN14594 3B*, EN166 1:B:3, EN397** LD 440 V a.c. EN352-3****	200	EN14594 3B*, EN166 1:B:3, EN397** LD 440 V a.c.	200

\* The M-Series Faceshields and Helmets meet the higher strength (B) requirements of EN14594. They are approved for use with a range of compressed air supply tubes that meet both the lower and higher strength (A and B) requirements

\*\* Versaflo M-300 and M-400 Series Helmets

\*\*\* Nominal Protection Factor – a number derived from the maximum percentage of total inward leakage permitted in relevant European Standards for a given class of respiratory protective devices.

\*\*\*\* With 3M™ Peltor™ H31 P3AF 300 Hearing Protector Helmet Attachment. SNR = 28; Size designation M/L. Contact 3M for full attenuation data including octave band and H, M and L values.



### 3M™ Versaflo™ M-100 Series Faceshields

for respiratory, eye and face protection:

**M-106** features a general purpose faceseal for dusts, spraying and chemical processing.

**Fabric material:** Polyurethane coated polyamide.

**M-107** features a flame resistant faceseal for applications with hot particles.

**Fabric material:** flame resistant polyester.



### 3M™ Versaflo™ M-300 Series Helmets

for respiratory eye, face and head protection:

**M-306** features a general purpose faceseal for construction, chemical applications and heavy industry.

**Fabric material:** Polyurethane coated polyamide.

**M-307** features a flame resistant faceseal for applications with hot particles.

**Fabric material:** flame resistant polyester



### 3M™ Versaflo™ M-400 Series Helmets with Shrouds

for respiratory, eye, face and head protection with additional neck and shoulder coverage:

**M-406** features a general purpose faceseal for dusts, spraying and chemical processing.

**Fabric material:** Cordura® nylon

**M-407** features a flame resistant faceseal for applications with hot particles.

**Fabric material:** flame resistant Nomex®

Nomex® is a registered trademark of Dupont. Cordura® is a registered trademark of Invista.



## 3M™ HT-600 Series Welding Shields and 3M™ 700 Series Safety Helmets

3M™ HT-600 Series Welding Shields not only offer respiratory protection but also face, eye and impact protection in metalworking and fabrication environments. The range offers choice of welding filter shades including auto-darkening and fixed shade.

3M™ HT-700 Series Helmets offer the user not only respiratory protection, but also EN166 approved eye and face protection as well as EN397 head protection. 3M™ HT-748 and HT-749 System can be equipped with either a fixed shade filter or an auto-darkening filter.

3M Air Delivery Unit	3M™ HT-600 Series Shields	3M™ HT-707 Safety Helmet	3M™ HT-748/749 Helmets	NPF**
3M™ Versaflo™ TR-300	EN12941 TH2, EN175	EN12941 TH2, EN166 2:B:3:9, EN397	EN12941 TH2, EN166 2:B:3:9, BS 1542 Class 4, EN397	50
3M™ Jupiter™	EN12941 TH2, EN175	EN12941 TH2, EN166 2:B:3:9, EN397	EN12941 TH2, EN166 2:B:3:9, BS 1542 Class 4, EN397	50
3M™ Versaflo™ V-500E/V-200E/V-100E	EN14594 2A*, EN175	EN14594 2A*, EN166 2:B:3:9, EN397	EN14594 2A*, EN166 2:B:3:9, BS 1542 Class 4, EN397	50

\* The 600/700 Series headtops meet the lower strength (A) requirements of EN14594. They are approved for use with a range of compressed air supply tubes that meet both the lower and higher strength (A and B) requirements.

\*\* Nominal Protection Factor - a number derived from the maximum percentage of total inward leakage permitted in relevant European Standards for a given class of respiratory protective devices. The protection factor is assigned by local authorities in each European country and can therefore be different for different countries.



### 3M™ HT-622 Welding Shield

A super-light shield for welders wanting to maximise the benefits of the Euromaski™ system. Wide range of welding filter shade combinations available.

Euromaski™ is a trademark of Euromaski Oy, Finland.



### 3M™ HT-629 Welding Shield

The solution for those welders needing a welding shield with a clear, wide view visor beneath. The 90x110 mm filter holder hinges down for easy access. Conventional or auto-darkening filters can be fitted.



### 3M™ HT-639 Welding Shield

Welding visor with great coverage. 90x110 mm welding filter holder for fixed shade or auto-darkening welding filter.



### 3M™ HT-707 Safety Helmet

Safety helmet, heat resistant shell. For especially hot work areas, the helmet features a heat resistant shell and it is also available with an optional radiant heat kit.



### 3M™ HT-748/749 Welding Helmet

Welding helmet, auto-darkening or fixed shade welding filter (90 x 110 mm for HT-748 and 3.25" x 4.25" for HT-749).

# Woodworking



The air inside woodworking facilities is often filled with fine particles. Other respiratory hazards can include

vapours from formaldehyde, adhesives, paints, and solvents.

		S-133	S-333G	S-433	S-533	S-655	S-657	S-757	S-855E	M-106
Application	Respiratory Hazards	3M™ Air Delivery Units								
<b>SURFACE COATINGS (Paints, Varnishes, Stains, Thinners)</b>										
Water based – brush/roller	Paint mist				● ●		● ●	● ●		● ●
Water based – spraying	Paint mist				●* ●		●* ●	●* ●		●* ●
Solvent based – brush/roller/spraying	Solvent vapours and mist				● ●**		● ●**	● ●**		● ●**
<b>HARDWOODS, SOFTWOODS AND MDF (MACHINING)</b>										
Sanding	Fine particles									● ●
Cutting	Fine particles									● ●
Routing	Fine particles									● ●
Manufacturing particle board, chipboard and MDF	Fine particles and formaldehyde vapours									●
<b>PAINT REMOVAL</b>										
Impact stripping	Fine particles				● ●		● ●	● ●		● ●
Abrasive stripping	Fine particles				● ●		● ●	● ●		● ●
Chemical stripping	Solvent vapours				●		●	●	●	●
<b>ADHESIVES</b>										
Strong epoxy-resin system adhesive – isocyanate based	Solvent vapours	●	●	●						
<b>TIMBER TREATMENT</b>										
Solvent based, e.g. white spirit	Solvent vapours and mist					● ●	● ●			● ●
Water based	Fine mist					● ●	● ●			● ●

● JUPITER ● TR-300 ● V-500E /V-200E /V-100E

This guide considers powered air turbo units as the primary source of air into the modular headtops. Alternatively, supplied air regulators may be used if a source of breathable quality compressed air is available. Please see 3M literature for further information. Note: Specific applications may require supplied-air regulators to be used.

\* If traces of organic solvent are present, 3M™ Jupiter™ Powered Air Turbo must be used in combination with the appropriate filters.

\*\* If paint contains isocyanate compounds, the 3M™ Versaflo™ V-Series regulator must be used due to poor warning properties of this compound.





# Surface Preparation, Painting and Coating



These activities can occur in a wide variety of industries including transportation, general manufacturing, autobody restoration and white goods manufacture. Preparing surfaces via chemical stripping typically releases solvent

vapours over large surface areas. Painting and coating these surfaces can expose workers to paint spray mists and solvent vapours.

		S-333G	S-533	S-655	S-657	S-757	S-855E	M-106	M-306
Application	Respiratory Hazards	3M™ Air Delivery Units							
<b>SURFACE CLEANING</b>									
High Pressure Water	Sugar soap mist		● ●				● ●	● ●	● ●
<b>POWER SANDING</b>									
Rust removal	Fine metal particles							● ●	● ●
Filler	Fine particles							● ●	● ●
Concrete and plaster	Fine particles							● ●	● ●
Softwood, hardwood	Fine particles							● ●	● ●
Plastics	Fine particles							● ●	● ●
Paint	Fine particles							● ●	● ●
<b>PAINT REMOVAL</b>									
Chemical stripping	Solvent vapours			●	●		●		
<b>PAINTING</b>									
Water based – brush/roller	Paint mist	● ●	● ●		● ●	● ●		● ●	● ●
Water based – spraying	Paint spray mist	●* ●	●* ●		●* ●	●* ●		●* ●	●* ●
Solvent based – brush/roller/spray	Solvent vapours and mist	● ●**	● ●**		● ●**	● ●**		● ●**	● ●**

● JUPITER ● TR-300 ● V-500E/V-200E/V-100E

This guide considers powered air turbo units as the primary source of air into the modular headtops. Alternatively, supplied air regulators may be used if a source of breathable quality compressed air is available. Please see 3M literature for further information. Note: Specific applications may require supplied-air regulators to be used.

- \* If traces of organic solvent are present, the 3M™ Jupiter™ Powered Air Turbo must be used in combination with the appropriate filters.
- \*\* If paint contains isocyanate compounds, the 3M™ Versaflo V-Series regulator must be used due to poor warning properties of this compound.





Farming can be incredibly dusty work. Airborne particles are released from haying, grain handling, and working with livestock — just to name a few dusty farmyard jobs.

Mixing and applying agricultural chemicals can release hazardous particles, gases and vapours, and therefore requires both respiratory protection and protective clothing.

For more information on 3M™ Personal Protective Equipment visit: [www.3m.eu/occsafety](http://www.3m.eu/occsafety).

The following table lists some common attributes of pesticides and agricultural chemicals, their hazards, and the options of 3M™ Versaflo™ Air Delivery Units for protection optimized.

		S-333G	S-433	S-533	S-655	S-657	S-757	S-855E	M-106	M-306	HT-600	HT-748/749
Application	Respiratory Hazards	3M™ Air Delivery Units										
<b>GENERAL APPLICATIONS</b>												
Pesticide application	Particulates					●	● ●	● ●	● ●			
Pesticide application	Water-based mists		●	●	●			● ●	● ●			
Pesticide application	Solvent-based mists				●			●	●			
Working with hay	Particulate	● ●		● ●	● ●	● ●			● ●	● ●		
Grain handling	Particulate	● ●		● ●	● ●	● ●			● ●	● ●		
Working with livestock	Particulate	● ●		● ●	● ●	● ●			● ●	● ●		
Welding	Particulate										●	●
Mixing chemicals /fertilizers	Particulate, gases and vapours							●	●			
Spraying paints	Particulate and organic vapours			● ●**		● ●**	● ●**					

● JUPITER ● TR-300 ● V-500E/V-200E/V-100E

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\*\* If paint contains isocyanate compounds, the 3M™ Versaflo™ V-Series regulator must be used due to poor warning properties of this compound.



# Pulp and Paper Processing



Pulp conversion and papermaking can expose workers to liquid splashes, gases, vapours, and fine wood pulp and paper particles. 3M™ Jupiter™ Turbo provides

respiratory protection with the full user mobility necessary for large pulp and paper facilities.

		S-333G	S-433S	S-655	S-657	S-855E	M-106	M-306
Application	Respiratory Hazards	3M™ Air Delivery Units						
<b>PREPARATION</b>								
Treating wood	Gases and vapours	●	●	●	●	●	●	●
Dissolving lignin in cooking liquid	Gases and vapours	●	●	●	●	●	●	●
Bleaching the pulp	Gases and vapours	●	●	●	●	●	●	●
Black liquor recovery	Gases and vapours	●	●	●	●	●	●	●
● JUPITER								



3M™ Versaflo™  
333G Headcover



3M™ Versaflo™  
S-433 Hood



3M™ Versaflo™  
S-655 Hood



3M™ Versaflo™  
S-657 Hood



3M™ Versaflo™  
S-855E Hood



3M™ Versaflo™  
M-106 Faceshield



3M™ Versaflo™  
M-306 Helmet

# Pharmaceutical Manufacturing



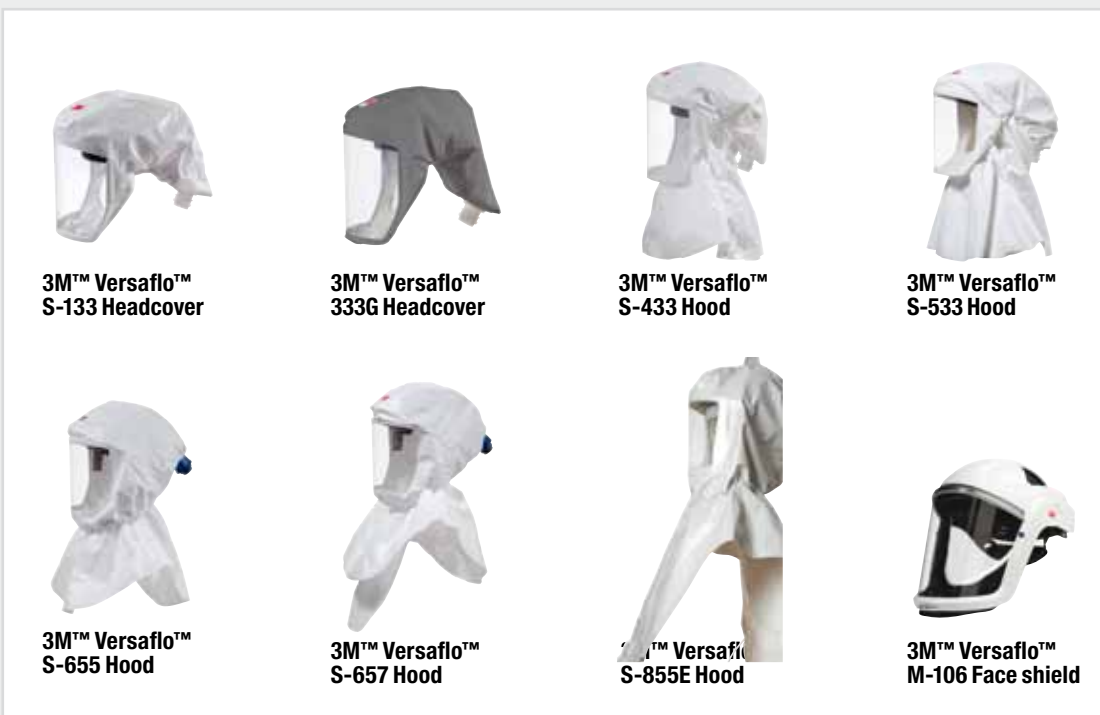
Fine particles, vapours, and cytotoxic drugs are all possible airborne hazards for drug manufacturers. 3M™ offers highly reliable respiratory protection combined with

coverage of head, or head, neck and shoulders, as well as providing limited eye and face splash and coverage (see headtop section for more details).

		S-133	S-333G	S-433	S-533	S-655	S-657	S-855E	M-106
Application	Respiratory Hazards	3M™ Air Delivery Units							
<b>MANUFACTURE OF MEDICINES</b>									
Chemical handling and drying	Fine particles and combined chemicals, cytotoxic drugs							●	
Mixing chemicals	Fine particles and combined chemicals, cytotoxic drugs							●	
Pulverising powders	Fine particles	● ●		● ●	● ●	● ●	● ●		● ●
Shaping	Fine particles, cytotoxic drugs	● ●		● ●	● ●	● ●	● ●		● ●
Size reduction	Fine particles, cytotoxic drugs	● ●		● ●	● ●	● ●	● ●		● ●
Transfer	Fine particles, cytotoxic drugs	● ●		● ●	● ●	● ●	● ●		● ●
<b>MAINTENANCE</b>									
Cleaning machines/equipment	Fine particles, vapours		●		●				

● JUPITER ● TR-300

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# Chemical Industry



The chemical processing industry uses and produces a vast array of wet and dry compounds. Workers must be protected from respirable hazards that can range from gases, vapours and mists to particulates from raw materials and additives.

Hazard-producing processes can include weighing,

dispensing, refining and purifying, as well as cleaning procedures.

The 3M™ Powered Air Turbos allows chemical workers full mobility — ideal for large processing facilities — while the 3M™ Supplied Air Units can also be used for a variety of applications.

		S-133	S-333G	S-433	S-533	S-655	S-657	S-855	M-106	M-306
Application	Respiratory Hazards	3M™ Air Delivery Units								
<b>PREPARATION</b>										
Chemical handling - particulate raw materials	Fine particles	●	●						●	
Chemical handling - liquid raw materials	Gases and vapours							●		
Chemical handling - solvents	Gases and vapours							●		
<b>CHEMICAL PROCESSES</b>										
General chemical processes	Fine particles, gases and vapours			●	●	●	●			●
Refining/Purifying e.g. distillation, precipitation, centrifuging and filtration	Fine particles, gases and vapours			●	●	●	●			●
<b>MAINTENANCE</b>										
Cleaning machines/equipment	Fine particles, vapours			●	●	●	●			●

● JUPITER ● TR-300

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**3M™ Versaflo™  
S-133 Headcover**



**3M™ Versaflo™  
333G Headcover**



**3M™ Versaflo™  
S-433 Hood**



**3M™ Versaflo™  
S-533 Hood**



**3M™ Versaflo™  
S-655 Hood**



**3M™ Versaflo™  
S-657 Hood**



**3M™ Versaflo™  
S-855E Hood**



**3M™ Versaflo™  
M-106 Face shield**



**3M™ Versaflo™  
M-306 Helmet**

# Medical and Healthcare

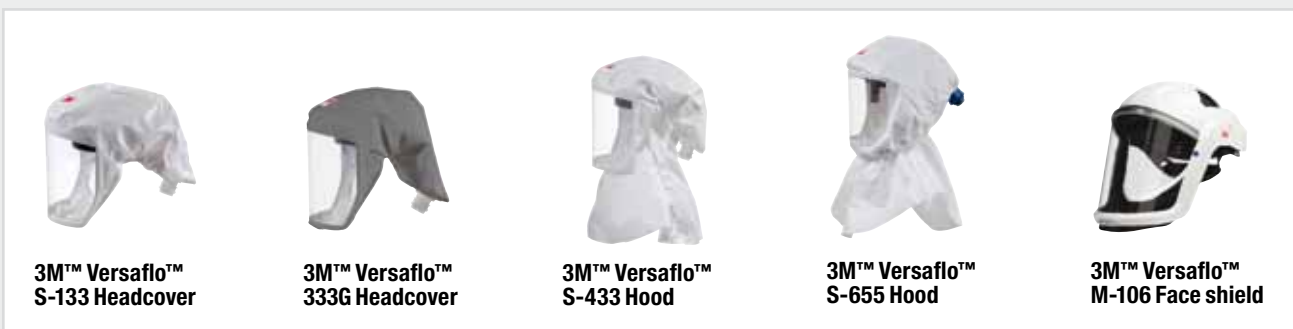


Many healthcare workers in hospitals and other medical facilities use powered air respirators for protection from potential exposures during medication treatments, nebulizer treatments, airway suctioning, and other procedures that may generate higher levels of aerosolized particles and respiratory secretions.

Sterilants and disinfectants used in these applications can also cause irritation of the respiratory system as well as the skin and eyes.

		S-133	S-333G	S-433	S-533	S-655	S-657	S-855E	M-106
Application	Respiratory Hazards	3M™ Air Delivery Units							
<b>LABORATORY SERVICES</b>									
Glutaraldehyde (and other) sterilisation	Gas and vapours	●	●		●	●	●	●	●
Infection control		●		●				●	
● JUPITER									

This guide considers powered-air filter units as the primary source of air into the modular headtops. Alternatively, supplied air regulators may be used if a source of breathable quality compressed air is available. Please see 3M literature for further information. Note: Specific applications may require supplied-air regulators to be used. Contact 3M for specific guidelines on use of headtops for infection control.



# Food and Beverage



Airborne particles from grain, flour, enzymes, yeast, and additives are just some of respiratory hazards faced by food and beverage manufacturers. 3M offers a variety of comfortable,

loose-fitting headtops appropriate for food and beverage processing and general maintenance cleaning of processing equipment.

		S-133	S-333G	S-533	S-655	S-657	S-855E	M-106
Application	Respiratory Hazards	3M™ Air Delivery Units						
<b>FLOUR PRODUCTION</b>								
Grain handling	Grain dust	● ●	● ●	● ●	● ●	● ●		● ●
Flour bagging	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
<b>BAKERIES – INGREDIENTS/DISPENSING</b>								
Bag opening and tipping 'rip & tip'	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Filling vats/hoppers	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Sieving – mechanical	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Weighing and dispensing materials	Flour additives (enzyme improvers)	● ●	● ●	● ●	● ●	● ●		● ●
Dough mixing	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Filling up flour dusters on production lines	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
<b>BAKERIES – HYGIENE DUTIES</b>								
Silos	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Flour lofts/stores	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Ingredients dispensing	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
Mixers/roll plants	Flour dust	● ●	● ●	● ●	● ●	● ●		● ●
<b>BREWING</b>								
Dispensing/handling	Grain dust/yeast powder	● ●	● ●	● ●	● ●	● ●		● ●
Filtration	Diatomaceous earth	● ●	● ●	● ●	● ●	● ●		● ●
General	Alcohol vapour	●	●	●	●	●		●
<b>GENERAL FOOD PROCESSING</b>								
Fish farms – Preparation of shellfish	Proteins	● ●	● ●	● ●	● ●	● ●		● ●
Fish farms – Fish gutting & preparation	Proteins	● ●	● ●	● ●	● ●	● ●		● ●
Food processing – Handling/weighing/mixing	Food additive dust	● ●	● ●	● ●	● ●	● ●		● ●
General Maintenance – cleaning	Chemicals, organic vapours						●	

● JUPITER ● TR-300

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# Metalworking



Welding fumes are complex mixtures of very small particles from welding electrodes, base metals, surface coatings, and shielding gases or fluxes. When all these components are burned or exposed to ultraviolet rays, they can also generate gases. These gases include carbon monoxide, ozone, nitrogen oxides, gaseous fluoride, or phosgene. When engineering controls alone cannot adequately reduce worker exposure levels, respirators may be appropriate.

Grinding wheels used by metalworkers can shatter, causing impact hazards to the face and eyes. Grinding can also vaporize base metals, paints, plating, and cleaning solvents, creating

respirable hazards. Grinding also generates airborne sparks and small particles that are hazardous to the face and eyes.

Metalworking fluids improve the machining process but can become aerosolized or vapourised by either the machining action or its heat.

3M™ Versaflo™ M-Series Helmets can be used to protect metalworkers from eye, face, and head hazards, while adding higher levels of respiratory protection than may be practical with engineering controls.

		M-107	M-307	M-407	HT-600	HT-748/749
Application	Hazards	3M™ Air Delivery Units				
<b>WELDING</b>						
Steel, not coated or painted	Particles				●	●
Steel painted (lead based paints)	Particles/Manganese				● ●	● ●
Stainless steel	Particles/Chromium				● ●	● ●
Aluminium	Particles				● ●	● ●
Steel galvanised	Particles				●	●
Steel painted and/or isolated	Particles/Isocyanate				●	●
Material cleaned with trichloroethylene					●	●
<b>SURFACE PREPARATION</b>						
Grinding	Particles, high speed impacts*	● ●	● ●	● ●	● ●	
Degreasing	Solvent vapours	● ●	● ●	● ●		
<b>MACHINING</b>						
Machining	Aerosolized oils & synthetic fluids	● ●	● ●	● ●		
Polishing	Fine particles, high speed impacts*	● ●	● ●	● ●		

● JUPITER ● TR-300 ● V-500E /V-200E /V-100E

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# Smelting & Foundries

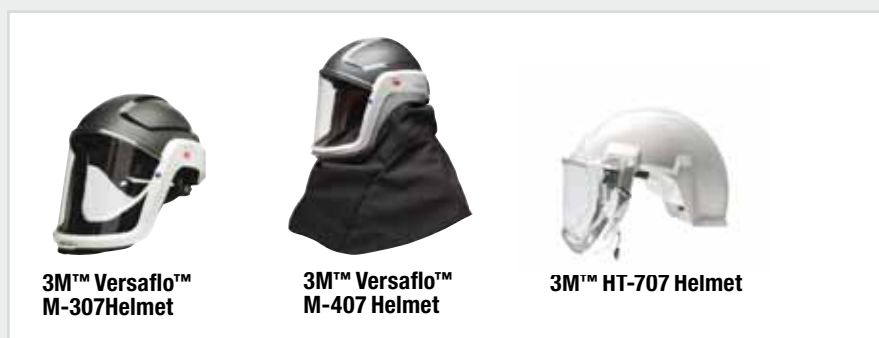


Metal fume fever is caused by inhaling certain metals as fine dust (particles). Exposure to these fumes can occur during smelting or casting processes. Additional airborne contaminants can include emissions from coke ovens (e.g., coal tar pitch volatiles) and vapours from degassing and purifying agents.

3M™ Versaflo™ M-Series Helmets can provide eye, face, and head, or eye, face, head, neck and shoulder coverage, as well as respiratory protection. Helmet accessories of special interest to these industries include headcovers in flame-resistant fabric.

		M-307	M-407	HT-707
Application	Hazards	3M™ Air Delivery Units		
<b>SMELTING</b>				
Degassing agent	Hexachloroethane	●	●	●
Lead	Lead & butadiene	●	●	●
Ore	Cadmium	●	●	●
Coke ovens	Emissions: coal tar, coal tar pitch, volatiles, creosote, polycyclic aromatic hydrocarbons and metals.	●	●	●
Gold	Mercury	● ●	● ●	● ●
Aluminum	Hydrogen fluoride	● ●	● ●	● ●
<b>FOUNDRIES</b>				
	Silica dust	● ●	● ●	● ●
	Ammonia vapour	●	●	●
	Chlorine vapour	●	●	●
	Nitrogen	●	●	●
	Toluene vapour	●	●	●
	Formaldehyde vapour	●	●	●
		● JUPITER ● TR-300 ● V-500E/V-200E/V-100E		

Note: The M-Series and HT-707 helmets do not meet the molten metal splash requirements of EN397. The M-Series visors do not meet the requirements of EN166 for protection against molten metals and hot solids. A radiant heat kit for the M-Series will be made available. This guide considers powered air turbo units as the primary source of air into the modular headtops. Alternatively, supplied air regulators may be used if a source of breathable quality compressed air is available. Please see 3M literature for further information. Note: Specific applications may require supplied-air regulators to be used.



# Construction and Building Renovation



Construction and renovation sites can pose multiple hazards to workers.

Virtually all construction projects generate large quantities of silica dust, either from excavating and earthmoving, or from work done in concrete, bricks, or masonry. Other ubiquitous hazards include wood dust particles and chemicals from engineered wood, such as fibreboard, pressure-treated lumber, and gluelam (glued laminated timber), that can contain adhesives (e.g., formaldehyde) and preservatives.

Fibreglass, rockwool, and ceramic insulation and sound attenuation materials may release synthetic mineral fibres which are highly respirable. While solvent-based coatings, paints, adhesives, degreasers, and cleaners can be used in vast quantities during key construction stages.

Renovation projects can disturb and make airborne microbiological particles, for example mould and bird and rodent droppings. Sewage spills can happen by accident at any site, or be endemic at derelict sites, with serious health risks for unprotected workers.

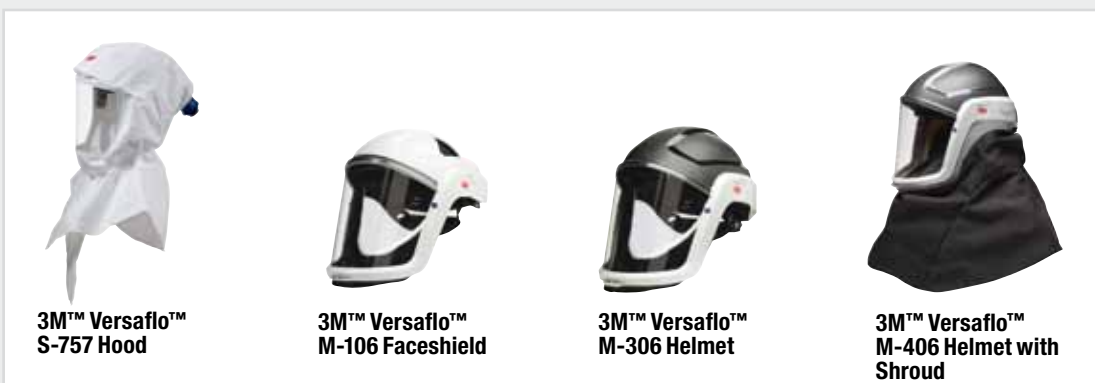
Road surfacing and roofing can necessitate the use of bitumen, creosote, paints, and other hazardous coatings. Welding of structural metal and plumbing can generate gases and fumes containing lead, cadmium, manganese, and numerous other contaminants. (For welding protection systems, please see Metalworking on page 20.)

The 3M™ Versaflo™ M-300 Series Helmets provide respiratory protection as well as eye, face and head protection for construction workers, while the M-400 Series Helmets offer additional neck and shoulder coverage.

		S-757	M-106	M-306	M-406
Application	Hazards	3M™ Air Delivery Units			
<b>SITE PREPARATION</b>					
Excavating	Silica dust			● ●	● ●
Excavating-contaminated soils	Organic vapours, chemicals, particles			●	●
Concrete & Masonry	Silica dust			● ●	● ●
Creosoting	Organic vapours			●	●
Underpinning	Dust, diesel fumes (machinery)			●	●
<b>BUILDING CONSTRUCTION</b>					
Grinding	Metal dust			● ●	● ●
Carpentry: natural wood	Fine wood particles			● ●	● ●
Carpentry: engineered wood	Formaldehyde, adhesives, preservatives			●	●
Plastering, drywalling	Fine particles			● ●	● ●
Insulation	Synthetic mineral fibres			● ●	● ●
<b>BUILDING COMPLETION</b>					
Painting, solvent-based (non-isocyanates)	Solvent vapours	●	●	●	●
Coatings, adhesives, sealants, cleaners	Organic vapours	●	●	●	●
Road surfacing	Organic vapours			●	●
Roofing	Organic vapours, particles			●	●
<b>RENOVATION WORK</b>					
Site preparation	Microbiological diseases, particles			● ●	● ●

● JUPITER ● TR-300 ● V-500E /V-200E /V-100E

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**3M™ Versaflo™ S-757 Hood**

**3M™ Versaflo™ M-106 Faceshield**

**3M™ Versaflo™ M-306 Helmet**

**3M™ Versaflo™ M-406 Helmet with Shroud**

# Demolition



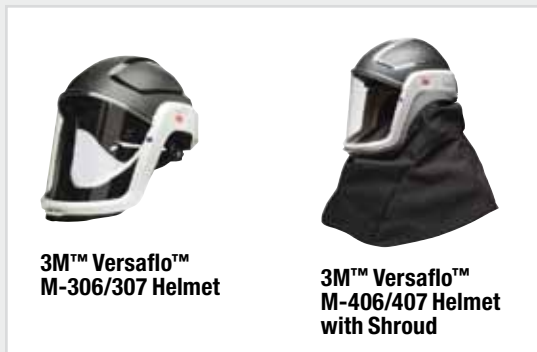
Demolition work can quickly release large quantities of hazardous materials. Common airborne contaminants include silica dust from concrete crushing and lead from pipe cutting. Demolition can also expose workers to microbiological hazards, such as mould, spores, etc. In addition to protecting demolition workers from respiratory hazards, the 3M™ Versaflo™ M-300

Series Helmets provide eye, face and head, protection, with the M-400 Series providing additional neck and shoulder coverage. Of particular interest to demolition workers, the M-300 Series Helmets can be fitted with 3M™ Peltor™ H-31 Helmet-Mounted Ear Muff Assembly Kit.

		M-306	M-307	M-406	M-407
Application	Hazards	3M™ Air Delivery Units			
<b>DEMOLITION WORK</b>					
General demolition	High speed impacts*	● ●		● ●	
Concrete crushing	High speed impacts*, silica dust	● ●		● ●	
Dismantling, moving rubble	Particles	● ●		● ●	
Pipe cutting & removal	Lead		● ●		● ●
Horsehair plaster removal	Particles	● ●		● ●	
Insulation removal	Fibres, asbestos**	● ●		● ●	
Derelict building clearing	Microbiological particles (moulds, spores etc)	● ●		● ●	

● JUPITER ● TR-300 ● V-500E/V-200E/V-100E

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## Dedicated to Worker Protection

3M has a long history of applying its innovative materials to the challenges of worker protection. Today, as one of the world's leading suppliers of respiratory protection, our goal is to ensure that we satisfy your needs through exceptional leadership, expertise, quality and service.

Visit us at [www.3M.eu/versaflor](http://www.3M.eu/versaflor)



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