



# Technical Datasheet

## 3M™ Speedglas™ 9100 Welding Shield

### Description:

The Speedglas 9100 Welding Shield:

- Is suitable for most welding applications up to Shade 13 in the dark state.
- Has permanent protection (Shade 13 equivalent) against harmful UV- and IR- radiation, regardless of whether the filter is in the light or dark state or whether the auto-darkening function is operational.
- Is easy to operate and maintain.
- Has seven different Shade Number settings in the dark state, split into two groups 5, 8 and 9-13.
- Has seven user selectable levels of detector sensitivity to ensure a reliable arc detection.
- Can be locked in a constant dark or light state.
- Has excellent visibility in light state, shade 3, for easy welding preparation and after treatment.
- Has three optical sensors on the welding filter.
- Has multiple adjustments for highest comfort on Shield, Head band and Welding filter.
- Can be used together with 3M Maintenance Free Respirators for welding.
- Solar panel power assistance (except Speedglas 9100XX).

### Applications:

The Speedglas 9100 Welding Shield is designed for most welding processes, such as MMA, MIG/MAG, TIG, plasma welding and oxyacetylene welding/cutting. The Speedglas 9100 Welding Shield can also be used for grinding applications.

### Approvals:

The Speedglas 9100 has been shown to meet the Basic Safety Requirements under the article 10 of the European Directive 89/686/EEC and is thus CE marked. The product complies with the harmonized European Standards EN 175, EN 166, EN 169 and EN 379. The product was examined at the design state by DIN Certco Prüf- und Zertifizierungszentrum (Notified body number 0196)

### Standards:

<u>Speedglas 9100:</u>	<u>Standards:</u>	<u>Class:</u>
Welding Filter	EN 379	1/1/1/2
Outer protection plate	EN 166	1BT
Inner protection plate	EN 166	1S
Welding shield	EN 175	B

#### Auto-Darkening Welding Filter

EN 379:2003 Personal eye-protection – Automatic welding filters.

#### Protection Plate. Clear Safety Lens

EN 166:2001 Personal eye-protection – Specifications.

#### Welding Shield

EN 175:1997 Personal eye-protection – Equipment for eye and face protection during welding and allied processes.

#### Optical class

##### EN 166

1 Optical class

##### EN 379

1/2/2/3	Pos 1	Optical class
1/2/2/3	Pos 2	Diffusion of light class.
1/2/2/3	Pos 3	Variation of luminous transmittance class.
1/2/2/3	Pos 4	Angle dependence of luminous transmittance class (option).

#### Mechanical Strength

##### EN 166, EN 175

No symbol	Minimum robustness
S	Increased robustness
F	Low energy impact (45 m/s)
B	Medium energy impact (120 m/s)
T	Tested at extremes of temperature (-5°C and +55°C)

#### Additional standards:

EN 169:2002 Personal eye-protection – Filters for welding and related techniques – Transmittance requirements and recommended use

EN 61000-6-3:2001 Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments

EN 61000-6-2:2001 Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for Industrial environments

### Materials:

**Protection plates:** Polycarbonate

**Plastics:** PPA, PA, PP, TPE and PE

**Optical Part:** LC-Elements, Glass, Polarizers

**Electronics:** Printed Circuit Board assembly

**Batteries:** Lithium 3V Type CR2032



## User instructions:

### On/Off



Activate by pressing the SHADE/ON button. The welding filter automatically turns OFF after one hour of inactivity.

### Selection of Shade Number setting



Seven different Shade Number settings split into two groups 5, 8, and 9-13 are available in the dark state. In order to see the current shade number setting, momentarily press the SHADE/ON button. To select another Shade Number, press the SHADE/ON button repeatedly while the LED indicators on the display are flashing. Move the flashing LED to the desired Shade Number. To shift between the two shade groups (shade 5, 8) and (shade 9-13) hold the SHADE/ON button down for 2 seconds. In all welding processes the arc should only be viewed with the recommended dark shade. See table.

### Sensitivity



The programming and sensitivity of the optical detector system (which responds to the light from the welding arc) can be adjusted to accommodate a variety of welding methods and workplace conditions. In order to see the current sensitivity setting, momentarily press the SENS button. To select another setting, press the SENS button repeatedly until the LED shows the desired setting.

### Position

Locked in light state (shade 3) at all times. Used for grinding.

**Position 1** Least sensitive setting. Used if there is interference from other welders arcs in the vicinity.

**Position 2** Normal position. Used for most types of welding indoors and outdoors.

**Position 3** Position for welding with low current or with stable welding arcs. (eg TIG welding)

**Position 4** Suitable for very low current welding, use of inverter type TIG welding machines.

**Position 5** Most sensitive setting. Used for TIG welding where part of the arc is obscured from view.

### Position

Locked in selected dark state. Same function as a passive welding filter.

### Position locked light state



This setting could be used for grinding or other non-welding activities. When the welding filter is locked in the light state (shade 3) the LED under the symbol will flash every 8 seconds to alert the user. The welding filter must be unlocked before arc welding is performed, by choosing a sensitivity setting for welding. When the welding filter turns OFF (after 1 hour inactivity), it will automatically leave the locked state and go to sensitivity 2.

### Position 1-5

If the filter does not darken during welding as desired, increase the sensitivity until the welding filter switches reliably. Should the sensitivity be set too high, the filter may remain in the dark state after welding is complete due to ambient light. In this case, adjust the sensitivity downward to a setting where the welding filter both darkens and lightens as desired.

### Position locked dark state



When the welding filter is locked in the dark state and the welding filter turns OFF (after 1 hour of inactivity), it will automatically reset to sensitivity setting 2.

### Delay



The delay function should be used to set the recovery delay from dark to light of the welding filter according to welding method and current. See table.

**Note** that the Sensitivity and Delay function are using the same LED indicators on the display.

### Comfort mode for tack welding



This setting may help reduce eye fatigue resulting from the eye constantly adjusting to differing light levels during tack welding. Tack welding mode uses an intermediate light state (shade 5). If an arc is not struck within 2 seconds the welding filter will switch to the normal light state (shade 3).

### Low battery indicator



The batteries should be replaced when the low battery indicator flashes or LEDs do not flash when the buttons are pressed.

### Note!

Other light sources with fast flashing light eg warning lights can make the optical detector react and make the filter darken/lighten with the same frequency as the flashing light source.

## Use limitations:

The Speedglas 9100 welding shield is not suitable for laser welding or laser cutting. The welding shield is excellent for all positions except heavy duty overhead cutting/welding operation due to the risk of molten metal.



## Spare parts and accessories:

### Part no.

#### Spare parts

Part no.	Description
50 00 05	SPEEDGLAS 9100V Auto darkening Welding Filter 5, 8/9-13
50 00 15	SPEEDGLAS 9100X Auto darkening Welding Filter 5, 8/9-13
50 00 25	SPEEDGLAS 9100XX Auto darkening Welding Filter 5, 8/9-13
50 11 90	SPEEDGLAS 9100 Shield without headband
50 18 90	SPEEDGLAS 9100 SW Shield without headband
53 20 00	SPEEDGLAS 9100 Silver front
53 30 00	SPEEDGLAS 9100 Headband including assembly parts
53 60 00	SPEEDGLAS 9100 Pivot mechanism, left and right for headband
53 10 00	SPEEDGLAS 9100 Welding filter battery holder pkg of 2
53 61 00	SPEEDGLAS 9100 Headband front part
53 62 00	SPEEDGLAS 9100 Headband back part

#### Consumables

52 60 00	SPEEDGLAS 9100 Outside protection plate standard pkg of 10
52 70 00	SPEEDGLAS 9100 Outside protection plate scratch pkg of 10
52 70 70	SPEEDGLAS 9100 Outside protection plate heat pkg of 10
16 80 15	SPEEDGLAS 9100 Sweatband pkg of 3
52 80 05	SPEEDGLAS 9100V Inner protection plate pkg of 5 marked 117x50
52 80 15	SPEEDGLAS 9100X Inner protection plate pkg of 5 marked 117x61
52 80 25	SPEEDGLAS 9100XX Inner protection plate pkg of 5 marked 117x77
42 20 00	Battery pkg of 2

#### Accessories

16 90 05	SPEEDGLAS 9100 Extended coverage crown in TecaWeld
16 90 10	SPEEDGLAS 9100 Extended coverage neck & ear in TecaWeld
16 91 00	Hood neck/head in TecaWeld
53 20 15	SPEEDGLAS 9100 Coverplate SW
17 10 20	Magnifying Lens 1.0
17 10 21	Magnifying Lens 1.5
17 10 22	Magnifying Lens 2.0
17 10 23	Magnifying Lens 2.5

## Technical specification

<b>Weight</b>	
Welding shield with SideWindows (incl silverfront)	265 g
Welding shield w/o SideWindows (incl silverfront)	240 g
Headband	120 g
Speedglas 9100V Welding filter	150 g
Speedglas 9100X Welding filter	160 g
Speedglas 9100XX Welding filter	185 g
<b>Viewing area</b>	
Speedglas 9100V Welding filter	45 x 93 mm
Speedglas 9100X Welding filter	54 x 107 mm
Speedglas 9100XX Welding filter	73 x 107 mm
<b>Switching time light-dark</b>	0,1 ms (+23°C)
<b>Opening time dark-light</b>	see Recovery Delay table
<b>UV / IR protection</b>	According to shade number 13 (permanent)
<b>Light state</b>	Shade no 3
<b>Dark state</b>	Shade no 5, 8, 9-13
<b>Fail /Safe state</b>	Shade no 5
<b>Battery type</b>	2 x CR2032 (Lithium 3 Volt)
<b>Battery lifetime</b>	
Speedglas 9100V Welding Filter	2800 hours
Speedglas 9100X Welding Filter	2500 hours
Speedglas 9100XX Welding Filter	2000 hours
<b>Operating temperature</b>	-5°C to +55°C
<b>Head sizes</b>	50 – 64

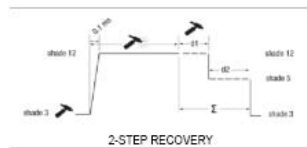
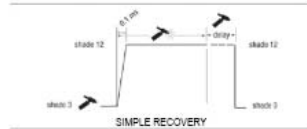
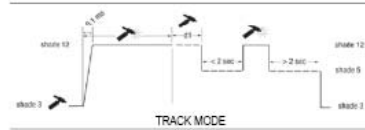


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### Delay (recovery delay)

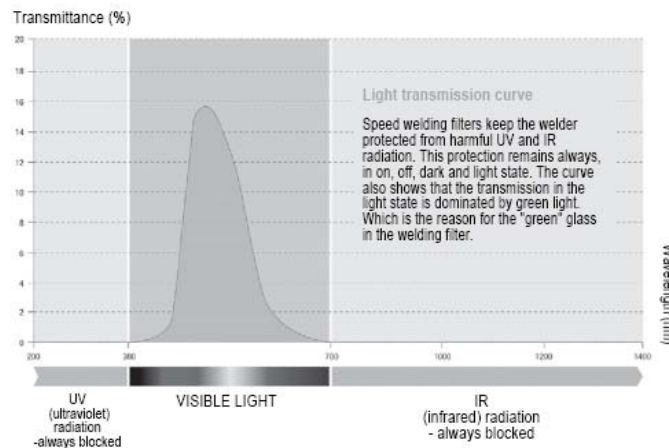
Shade	Delay										
	d1	d1	d1	d1	d1	d2	Σ	d1	d2	Σ	
5	40	40	60	90	130		200			300	
8	40	40	60	100	150		250			400	
9	40	40	60	100	150	200	300	500	375	625	1000
10	40	40	70	150	200	300	300	600	425	625	1050
11	50	50	80	200	300	375	325	700	475	625	1100
12	50	50	90	250	400	475	325	800	575	625	1200
13	60	60	100	300	450	525	325	850	675	625	1300

\*) comfort made for task welding is described in the User Instruction



Welding process	Current in amperes A																					
	1.5	6	10	15	30	40	60	70	100	125	150	175	200	225	250	300	350	400	450	500	600	
MMAW (covered electrodes)			8					9	10		11			12		13			14			
MAG			8					9	10		11			12					13			14
TIG			8		9			10		11			12		13							
MIG								9	10		11		12		13		14					
MIG with light alloys									10		11		12		13		14					
Air-arc gouging					10						11		12		13		14		15			
Plasma jet cutting									9	10	11		12		13							
Microplasma arc welding		4	5	6	7	8	9	10		11		12										

The table recommends best dark shade of welding filter for various working applications. According to the conditions of use, the next greater or the next smaller scale number can be used.



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