

Welding and Cutting

TABLE 31-B
FILTER LENS SHADE NUMBERS FOR
VARIOUS WELDING AND CUTTING
OPERATIONS (WELDER AND HELPERS)

Type of Operation	Recommended Shade Number
Resistance welding, and for protection against stray light from nearby welding and cutting (if persons are out of the danger zone)	Clear or filters up to No 2
Torch brazing or soldering	3 to 4
Light oxygen cutting and gas welding (to $\frac{1}{8}$ in)	4 or 5
Oxygen cutting, medium gas welding ($\frac{1}{8}$ to $\frac{1}{2}$ in) and arc welding up to 30 amps	5 or 6
Heavy gas welding (over $\frac{1}{2}$ in) and arc welding and cutting from 30 to 75 amps	6 or 8
Arc welding and cutting from 75 to 200 amps	10
Arc welding and cutting from 200 to 400 amps	12
Arc welding and cutting exceeding 400 amps	14

NOTE Flash goggles should be worn under all arc-welding helmets particularly for gas-shielded metal arc welding

Adapted from Welding Handbook, 5th ed American Welding Society

items should conform to ANSI Standard Z2 1, *Safety Code for Head, Eye, and Respiratory Protection*. Table 31-B is a guide for selecting the correct filter lens for various welding and cutting operations. Goggles or spectacles should have side shields. Guidance for lens care is given in Chapter 38, "Personal Protective Equipment."

Protective clothing

Some of the items of protective clothing needed by welders (Fig 31-12) are

- 1 Flame-resistant gauntlet gloves, except on very light work
- 2 Aprons of leather, asbestos, or other flame-resistant material to withstand radiated heat and sparks
- 3 For heavy work, fire-resistant leggings, high boots, or similar protection
- 4 Safety shoes, wherever heavy objects are handled. Low-cut shoes with unprotected tops should not be used because of the spark hazard
- 5 For overhead work, capes or shoulder covers of leather or other suitable material. Skull caps of leather or flame-resistant fabric may be worn under helmets to prevent head burns. Also, for overhead welding, ear protection (wool or rubber plugs or wire screen protectors) is sometimes desirable
- 6 Safety hats or other head protection against sharp or heavy falling objects

Operators and other persons working with inert-gas shielded arc welding should keep all parts of the body which could be exposed to the ultraviolet and infrared radiation covered to protect against skin burns and other types of injuries. Dark clothing, particularly a dark shirt, is preferable to light-colored clothing in order to reduce reflection to the operator's face underneath the helmet.

Cotton clothing disintegrates in from one day to two weeks, presumably because of the high ultraviolet radiation from arc welding and cutting. Wool or leather clothing, therefore, is preferable to cotton because it is more resistant to deterioration.

For gas-shielded arc welding, woolen clothing is also preferable to cotton. It is not readily ignited and protects the welder from changes in temperature. Cotton clothing, if used, should be chemically treated to reduce flammability. In either case, clothing should be thick enough to keep radiation from penetrating it.

Outer clothing should be reasonably free from oil and grease. Sleeves and collars should be kept buttoned. Aprons and overalls should have no pockets, in which sparks could be caught, on the front of them. For the same reason, trousers or overalls should not have turned-up cuffs.