

90.01 - Optical fibres and optical fibre bundles; optical fibre cables other than those of heading 85.44; sheets and plates of polarising material; lenses (including contact lenses), prisms, mirrors and other optical elements, of any material, unmounted, other than such elements of glass not optically worked.

9001.10 - Optical fibres, optical fibre bundles and cables

9001.20 - Sheets and plates of polarising material

9001.30 - Contact lenses

9001.40 - Spectacle lenses of glass

9001.50 - Spectacle lenses of other materials

9001.90 - Other

This heading covers :

(A) **Optical fibres and optical fibre bundles, as well as optical fibre cables other than those of heading 85.44.**

Optical fibres consist of concentric layers of glass or plastics of different refractive indices. Those drawn from glass have a very thin coating of plastics, invisible to the naked eye, which renders the fibres less prone to fracture. Optical fibres are usually presented on reels and may be several kilometers in length. They are used to make optical fibre bundles and optical fibre cables.

Optical fibre bundles may be rigid, in which case the fibres are agglomerated by a binder along their full length, or they may be flexible, in which case they are bound only at their ends. If coherently bundled, they are used for transmission of images, but if randomly bundled, they are suitable only for transmission of light for illumination.

Optical fibre cables of this heading (which may be fitted with connectors) consist of a sheath containing one or more optical fibre bundles, the fibres of which are not individually sheathed.

Optical fibre bundles and cables are used primarily in optical apparatus, particularly in endoscopes of heading 90.18.

(B) **Polarising material in sheets or plates** which consist of specially treated sheets or plates of plastics, or of sheets or plates in which a layer of "active" plastics is supported on one or both sides by other plastics or by glass. This sheet or plate material is cut to shape to make the polarising elements described at Item (6) below.

(C) **Optical elements of glass, optically worked, not permanently mounted.** In order to distinguish between optical elements of glass of this heading and those of **Chapter 70** it is necessary to determine whether or not they have been optically worked.

The optical working of glass is usually performed in two stages, viz., the production of the surfaces to the shape required (i.e., with the necessary curvature, at the correct angle, etc.), and the polishing of these surfaces. This working consists of grinding the surfaces by means of abrasives, rough at first, then gradually finer, the successive operations being roughing, trueing, smoothing and polishing. Finally, in the case of lenses required to be of an exact diameter, the edges are ground; this is known as the centring and edging operation. This heading applies only to optical elements of which the whole or part of their surface has been polished in order to produce the required optical properties. It applies therefore to elements which have been ground and polished as described above, and also to elements which have been polished after moulding. The heading **does not apply** to unpolished elements having undergone merely one or more of the processes which precede polishing. Such elements fall in **Chapter 70**.

- (D) **Optical elements of any material other than glass, whether or not optically worked, not permanently mounted** (e.g., elements of quartz (other than fused quartz), fluorspar, plastics or metal; optical elements in the form of cultured crystals of magnesium oxide or of the halides of the alkali or the alkaline-earth metals).

Optical elements are manufactured in such a way that they produce a required optical effect. An optical element does more than merely allow light (visible, ultraviolet or infrared) to pass through it, rather the passage of light must be altered in some way, for example, by being reflected, attenuated, filtered, diffracted, collimated, etc.

Optical elements with a temporary mounting provided **solely** for protection during transport are considered to be unmounted.

Subject to the provisions set out above regarding optical elements of glass, this heading includes :

- (1) **Prisms and lenses** (including compound prisms and lenses assembled by means of an adhesive cement), whether or not with unfinished edges.
- (2) **Plates and discs with plane or plane-parallel faces** (e.g., proof planes or optical flats for checking the flatness of a surface).
- (3) **Ophthalmic lenses**. These lenses may be aspherical, spherical, spherocylindrical, uni-focal, bi-focal or multi-focal. They also include **contact lenses**.
- (4) **Mirrors constituting optical elements**. These are used, for example, in telescopes, projectors, microscopes, medical, dental or surgical instruments, and sometimes as vehicle rear-view mirrors.
- (5) **Colour filters** (e.g., for photographic cameras).
- (6) **Polarising elements** (for microscopes or other scientific instruments; for sunglasses; for spectacles for viewing three-dimensional cinematograph films, etc.).
- (7) **Diffraction gratings**. These may be :
 - (a) Highly polished glass on which parallel lines have been cut close together at regular intervals (e.g., 100 lines per millimetre).
 - (b) "Replica" gratings consisting of a thin film of plastics or gelatin on a support such as a plate of glass. The thin film bears an impression of the lines of an original ruled grating.

These gratings are used in the same way as prisms for study of spectra.

- (8) **Interference filters.** These consist of alternate very thin films of, for example, magnesium fluoride and silver sandwiched between two plates of glass or between two 45° glass prisms (forming a cube). They are used as colour filters or for splitting a beam of light into two components.
- (9) **Halftone or similar printing screens, generally round or rectangular (including square), of carefully polished glass** (original screens for photogravure or process engraving), consisting of :
 - (i) two plates of glass, etched with very fine parallel lines, rendered opaque with a special varnish, which are then stuck together so that the lines are exactly at right angles; or
 - (ii) a single glass plate on which small hollows, usually square, have been etched and rendered opaque with a special varnish.

Some of the optical elements listed above (lenses, prisms, etc.) may be coloured, or coated with an anti-reflection film of cryolite, calcium or magnesium fluoride, etc. This does not affect their classification in this heading.

The heading **does not cover** :

- (a) Cultured crystals, not being optical elements (generally **heading 38.24**).
- (b) Mirrors of **heading 70.09**, i.e., glass mirrors not optically worked. Simple plane or even curved mirrors (e.g., shaving mirrors and mirrors for powder compacts) are therefore classified in **heading 70.09**.
- (c) Optical elements of glass of **heading 70.14**, i.e., elements not optically worked (generally moulded) (see Explanatory Note to heading 70.14).
- (d) Glasses of **heading 70.15**, not optically worked (e.g., blanks for contact lenses or for corrective spectacle lenses, for goggles, for protecting the dials of measuring instruments, etc.).
- (e) Mirrors, not constituting optical elements, of precious metal (**Chapter 71**), or of base metal (**heading 83.06**).
- (f) Connectors for optical fibres, optical fibre bundles or cables (**heading 85.36**).
- (g) Optical fibre cables made up of individually sheathed fibres (**heading 85.44**).