

# Instructions for Handling Optical Elements AR Coated for 10.6 Microns

## 1. Introduction

The high-quality IR anti-reflective coatings of the type AR 10.6 contain trace amounts of the radioactive substance thorium.

The thorium layer is embedded between other thin layers and thus forms a "closed radioactive source". That means that in an undamaged state no radioactive material can escape from the coating. The outermost layer of the coating consists of a non-radioactive material, that was chosen to protect the underlying layers effectively due to its good mechanical properties.



## 2. Instructions for Normal Handling of Coated Parts

There is NO RISK OF RADIOACTIVE RADIATION during normal handling or cleaning of the optics.

The thorium layer, see above, is potentially hazardous to health when inhaled or swallowed. Eating, drinking, and smoking is not recommended in the affected work areas. After every skin contact with the coated components, the corresponding body area should be thoroughly washed immediately. Care must be taken when touching or cleaning the optics. Vinyl gloves are quite sufficient.

## 3. Handling Instructions for Scratched AR 10.6 Coatings

The handling of scratched coatings is generally associated with a very low risk. Nevertheless, it should be pointed out that through scratches in the coating, small amounts of thorium can be released, which are hazardous to health when inhaled or swallowed.

When handling scratched optics, it is advised, despite the low level of radioactivity, to use a protective mask or respirator filter to prevent inhalation or ingestion of thorium. In addition, hands should be thoroughly washed after coming into contact with a scratched coating. A complete protective suit is not required. Any material, such as used cloths, gloves, and masks, should be disposed of in a plastic bag, packed and sealed after use.

#### 4. Instructions for Handling Broken Optical Elements with AR 10.6 Coating

In addition to the hazards described in section 3, broken elements may cause skin damage. If a broken optical element has caused a skin injury, the wound must first be medically treated and closed before the clean-up procedure is started.

The fragments themselves represent closed radioactive sources. Only a small part of thorium can be released by a broken lens. However, to prevent small lens fragments from sticking to clothing during the cleanup, a paper body cover is recommended together with a respirator filter and gloves. Blowing up dust should also be avoided as far as possible when sweeping up the shattering dust.

The fragments, brooms, shovels, respirator filters, gloves, and paper coating must put in a box that is wrapped in a plastic bag and sealed. Then it must be brought to disposal. The legal framework conditions for disposal are laid down in the Radiation Protection Ordinance.