

The Use of Tritium in Plastic Watches

This information sheet has been developed by the Radiation Safety Program of the Department of Human Services in response to newspaper articles on radiation exposure from wearing plastic luminous dial watches containing tritium.

Introduction

On 8 January 1994, *The Age* newspaper ran an article on the use of the radioactive material tritium in plastic watches¹. The tritium is used in luminous dial watches to cause the luminous material to glow in the dark. The newspaper article was based upon a report published in the British medical journal *The Lancet*² (which was not available in Australia at that time) which stated that wearing plastic watches which contain tritium increased the wearer's exposure to radiation. It had been found that the tritium is absorbed by the wearer through skin contact with the back of the plastic watch.

This news article caused some members of the public to be concerned about the level of exposure received from wearing such watches and whether they should continue to wear such watches.

Tritium Use and Exposure

The only known user of tritium luminous compound in plastic watches is the Swatch watch company. Information sought from the Swatch company indicated that the use of tritium was within European standards and not hazardous. It was also stated that tritium had not been used in Swatch watches since February 1993.

The original report from *The Lancet* has now been obtained. It outlined the analysis performed on the watches, tests conducted on a sample of people wearing luminous plastic watches, and the reported resultant dose received from wearing a plastic watch containing tritium.

Radiation Dose Units

Radiation dose is expressed in units called *microsieverts*. The microsievert measures

effective dose which takes into account the type of radiation and which parts of the body are being irradiated. The estimated annual effective dose was up to 20 microsieverts for a person who wears a luminous plastic cased watch all the time. The mean annual effective dose for those tested was four microsieverts.

The table overleaf compares the effective dose from wearing a plastic watch containing tritium to that from other common situations.

Examples of Radiation Exposure	Effective Dose (microsieverts)
Typical annual dose from wearing a plastic watch containing tritium	4
Radiation dose from cosmic rays in air travel, Melbourne to Perth	13
Average chest X-ray dose	20
Average annual dose from natural background radiation	2100

Conclusion

The increase in radiation exposure from wearing the above watches is considered negligible in comparison with background radiation levels and hence the luminous Swatch watches do not present a health hazard. The wearers of such watches do not need to dispose of their watches or change their wearing habits on the basis of the *Lancet* article.

References

- ¹ Ewing, T. 1994, 'If it's plastic and glows in the dark, watch out', *The Age*, 8 January.
- ² Brunner, P., Schneider, P., Scheicher, H., Seyerl, G., Kurnik, P., Ennemoser, O., & Ambach, W. 1994, 'Tritium exposure from plastic case watches', *The Lancet*, Volume 343, Number 8889, 8 January.

Further Information

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