

Report to the Tyne and Wear Trading Standards Joint Committee

22 September 2016

Safety of Laser Pointers

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Purpose of the report

To update the Committee on the response provided nationally and locally to the safety issues which concern the safety of laser pointers.

1. The misuse of laser pointers (sometimes referred to as laser pens) reported in the press has generated public concern over the safety of these devices.
2. Laser pointers are small handheld battery-powered devices that project narrow laser beams. Their original purpose was for use in presentations or for pointing out objects. They can come with various beam colours. At low powers, the human eye can only see the dot where the laser beam hits a target. However, high power laser beams can be visible in the air. Astronomers use the laser beam to guide viewers towards stars and other objects in the night sky.
3. Laser pointers have many legitimate uses. In the classroom, teachers can use them for demonstrations of optical principles. They can be used as alignment aids and in construction. However, low power lasers are usually adequate. The technological development in laser technology has decreased the size of laser products, increased the powers, and reduced the cost significantly.
4. Rejected laser components from professional products are being bought by manufacturers of novelty laser products without appropriate quality control and compliance with safety standards. Recently, the low costs of the lasers has made them popular as toys among children and young adults which has led to the lasers being used in ways that are not appropriate. At the time of writing, laser pointers up to 6 watts are readily available over the internet. These are very dangerous for the user and for anyone who may be targeted by the laser beam.

Parliament 15 March 2016

Oliver Dowden MP, Hertsmere

5. *“As the Minister knows, I told her about the case of a seven-year-old boy in my constituency who was almost blinded last year by a laser pen he had purchased at a Christmas fair. The problem is that laser pens are very dangerous but are being marketed to children as toys. Will the Minister further update the House on what the Government are doing to stop this form of marketing?”*

Anna Soubry. Business Minister

6. *I cannot see how that can possibly be legal—actually, I am of the view that it must be illegal—which is why we are contacting trading standards officers and also, of course, the police. I know that my hon. Friend has already contacted his local trading standards officers, who in turn have contacted the police, and an investigation is taking place. As a result, I am confident that the message will be put out so that we can stop the import of laser pens, which is another reason I want to work with the European Union. I cannot see how on earth it can be right that it is legal to sell these pens as toys, because they are clearly not”.*

Government Announcement

Sky News 21 March 2016

7. “Business Minister Anna Soubry has demanded a crackdown on importers and retailers selling illegal lasers as toys.
8. *"You will be aware of recent media reports of young children and teenagers that have suffered permanent eye damage from having laser pens shone directly at their eyes, whether intentionally or not," she wrote in a letter to Trading Standards.*
9. *"I have been made aware of at least 159 such incidents since 2013 and I understand the number is increasing year-on-year. Under the current classification system, any lasers being sold as toys should not be powerful enough to cause any eye damage at all.*
10. However, Ms Soubry said some importers and retailers appeared to be ignoring the legislation.
11. *"I am particularly concerned where these are clearly being marketed at children, for example on market stalls and at school fairs," she added. "I hope you agree with me that urgent action must be taken to stop this from happening. I believe your experience and expertise on toy safety issues and safety campaigns makes you ideally placed to help."*
12. The UK Civil Aviation Authority has recorded more than 8,990 laser incidents across the country between 2009 and June 2015. A 23-year-old man was arrested in Northern Ireland on 12 March, accused of endangering an aircraft after a laser was shone at a police helicopter. In February, a Virgin Atlantic flight to New York has been forced to return to Heathrow Airport after a laser beam was pointed at the plane - prompting urgent action in the cockpit”.

Laser Classification

13. The laser classification scheme was introduced over 40 years ago to provide guidance to users of lasers. The following laser classification scheme is taken from BS EN 60825-1.

Class 1

14. Class 1 lasers are products where the radiant power of the laser beam accessible (the accessible emission) is always below or equal to the Maximum Permissible Exposure value. Therefore, for Class 1 lasers the output power is below the level at which it is believed eye damage will occur. Exposure to the beam of a Class 1 laser will not result in eye injury. Class 1 lasers may therefore be considered safe. However, Class 1 laser products may contain laser systems of a higher Class but there are adequate engineering control measures to ensure that access to the beam is not reasonably likely during normal use.
15. Examples of such products include laser printers and compact disc players, but also high-power materials processing lasers. In practice, most Class 1 laser products do not emit any accessible laser radiation. All toys should be Class 1.

Class 1C

16. Class 1C lasers are intended for use on the skin. They are safe to the eye due to safety measures that identify when the laser applicator is on contact with the skin. Class 1C lasers are used for applications, such as hair management. Class 1C products are not yet available, but are likely to appear on the market later in 2016 or early 2017. Products that are likely to be Class 1C are currently Class 3B or Class 4.

Class 2

17. Class 2 lasers are limited to a maximum output power of 1 milliwatt, one-thousandth of a watt (abbreviated to mW) and the beam must have a wavelength between 400 and 700 nm. A person receiving an eye exposure from a Class 2 laser beam, either accidentally or as a result of someone else's deliberate action (misuse) will be protected from injury by their own natural aversion response. This is a natural involuntary response which causes the individual to blink and avert their head thereby terminating the eye exposure. Repeated, deliberate exposure to the laser beam may not be safe, but no injuries have been reported. Some laser pointers and barcode scanners are Class 2 laser products.

Class 1M

18. Class 1M lasers are products which produce a large diameter beam. Therefore, only a small part of the whole laser beam can enter the eye. However, these laser products can be harmful to the eye if the beam is viewed using magnifying optical instruments. Some of the lasers used for fibre-optic communication systems are Class 1M laser products.

Class 2M

19. Class 2M lasers are products which produce a large diameter beam in the wavelength range 400 to 700 nm. Therefore, only a small part of the whole laser beam can enter the eye and this is limited to 1 mW, similar to a Class 2 laser product. However, these products can be harmful to the eye if the beam is viewed using magnifying optical instruments or for long periods of time.

Class 3R

20. Class 3R lasers are higher powered devices than Class 1 and Class 2 and may have a maximum output power of 5 mW or 5 times the Accessible Emission Limit for a Class 1 product. The laser beams from these products exceed the maximum permissible exposure for accidental viewing and can potentially cause eye injuries for extremely long-term viewing, although the risk of injury is still low. Examples of Class 3R products include some laser pointers and some alignment products used for home improvement work.

Class 3B

21. Class 3B lasers may have an output power of up to 500 mW (half a watt). Class 3B lasers may have sufficient power to cause an eye injury, both from the direct beam and from reflections. The higher the output power of the device the greater the risk of injury. Class 3B lasers are therefore considered hazardous to the eye. However, the extent and severity of any eye injury arising from an exposure to the laser beam of a Class 3B laser will depend upon several factors including the radiant power entering the eye and the duration of the exposure.

22. Evidence suggests that an eye exposure to a laser beam above about 10 mW is likely to cause an injury. Examples of Class 3B products include lasers used for physiotherapy treatments and many research lasers. Some of the laser pointers found on the market are also Class 3B laser products.

Class 3B lasers are not suitable for general use by consumers.

Class 4

23. Class 4 lasers have an output power greater than 500 mW (half a watt). There is no upper restriction on output power. Class 4 lasers are capable of causing injury to both the eye and skin and will also present a fire hazard if sufficiently high output powers are used. Lasers used for many laser displays, laser surgery and cutting metals may be Class 4 products. A number of laser pointers found on the market have been Class 4.

Class 4 lasers are not suitable for use by consumers.

24. Public Health England (PHE) advice is that if only lasers up to 1 mW are generally available to the public, we can guarantee safety. PHE are not saying, and never have said, that products that exceed 1 mW are necessarily dangerous (or not safe as defined in the GPSR) until the powers reach about 10 mW. Having said that, most applications that a member of the public will have for laser products can be adequately carried out with a Class 1 or Class 2 laser product, and occasionally with a Class 1M, 2M or 3R laser product. There is rarely any justification for a member of the public to have a Class 3B or Class 4 laser. At work, employees would be required to be trained and suitable safety measures used to ensure that people are not at risk of injury.

1. Project Key activities and timeframes

Activity	Resource	Notes
Research and analyse issue and prepare project plan	Project plan developed.	Plan developed
Obtain, analyse and review all available market data including the retail sector online.	Project Lead	Evaluation undertaken
Development of Guidance document with Public Health England	Project Lead.	Guidance document developed and published on national product safety database.
Highlight issue with Safety at Ports and Border Points	Project lead	Contact made and request made through. Work underway.
Development of warning poster to be branded with partner agencies and promoted through social media and public health partners. BIS, RoSPA, CAPT and NTS all participating.	Project Lead	Developed and published on national product safety database.
To carry out sampling and testing programme.	Project Lead	Regional application bid for funding to BEIS successful. Sampling programme began with 60 samples purchased online. Testing of the samples to begin.

Recommendation

25. The Committee is asked to note the information.