

MEDICAL DEVICES : Guidance document

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GUIDELINES RELATING TO THE APPLICATION OF :
THE COUNCIL DIRECTIVE 90/385/EEC ON ACTIVE IMPLANTABLE MEDICAL DEVICES
THE COUNCIL DIRECTIVE 93/42/EEC ON MEDICAL DEVICES

“USE-BY” DATE”

1. Requirements

The medical devices directives (MDD, AIMD, [draft IVD]) each require a statement given on the label and/or the information provided with the device on any time limitation on the safe use of the device. Although the wording differs, each addresses the need to provide this information:

MDD, annex I, 13.3:	AIMD, annex 1, 14:	[IVD (draft 13 May 1997), annex 1, 13.4]:
"The label must bear the following particulars: ... (e) where appropriate, an indication of the date by which the device should be used, in safety, expressed as the year and month; ..."	"Every device must bear ... : ... - an indication of the time limit for implanting a device safely."	"The label must bear the following particulars ... : ... (e) if necessary, an indication of the date by which the device or part of it should be used, in safety, expressed as the year, the month and, where relevant, the day, in that order; ..."

2. Purpose of this recommendation

In the case of devices covered by the AIMD, a time limit must always be given.

In the case of devices covered by the MDD [and the draft IVD], a time limit is only required where "appropriate" [or "necessary"]. The purpose of this recommendation is to

- a) assist the manufacturer in deciding whether a "use-by" date is required for his particular device and
- b) indicate what information is required to support his decision.

Note: The "use-by" time limit relates to the period before the first use of the device. It does not relate to the number or period of subsequent uses (the "lifetime" of the device).

If the device is reusable, the MDD separately requires (annex I, 13.6 (h)) "... information on ... any restrictions on the number of reuses."

If the device is for single use, but over a prolonged period, any limitations on what would be the expected pattern of use would be required as "... special operating instructions" or "... warnings and/or precautions to take" (MDD, annex I, 13.3 (j) and (k) respectively).

Note: There is nothing in the medical devices directives which prohibits a manufacturer voluntarily recommending a "use-by" date, even though the performances and characteristics are not in fact affected by the passage of time.

3. How to decide if a "use-by" date is required

A “use-by“ date is required where a safety-related characteristic or claimed performance is likely to deteriorate over time.

In deciding whether there is such a "safety-related" deterioration, the manufacturer must have regard to the results of the risk analysis and measures taken to manage risk.

- a) The risk analysis will identify *those performances and characteristics* necessary for the safe use of the particular device.
 - For example, the risk analysis may indicate that sterility is necessary for safe use. Equally, the risk analysis would not cover the colour of the device if this is purely aesthetic, but it might cover the colour of the device if that colour has a purpose related to safe use of the device (e. g. the colour signifies the size of the device).
- b) The risk analysis and measures taken to manage risk will also identify the *level or extent* of performance or characteristic but only in so far as they are relevant to safe use of the device.
 - For example, the level of resistance to gas flow or rate of leakage from a breathing system, or the probability of non-sterility.
- c) The risk analysis and measures taken to manage risk will also identify the *period* over which the relevant performance or characteristic would be expected to be maintained for safe use, including the shelflife and intended period of use.
 - For example, the period over which a pacemaker battery maintains sufficient energy to function after implantation as long as intended by the manufacturer.

4. Information that is required to support the decision

4.1 Information necessary if a “use-by“ date is given

The manufacturer must demonstrate that the relevant performances and characteristics of the device are maintained over the claimed shelf life which the “use-by“ date reflects.

This may be achieved by

- a) prospective studies using accelerated ageing, validated with real time degradation correlation; or
- b) retrospective studies using real time experience, involving e.g. testing of stored samples, review of the complaints history or published literature etc.; or
- c) a combination of a) and b).

4.2 Information necessary if a “use-by“ date is not given

As the absence of a “use-by“ date constitutes an implicit claim of an infinite shelf life, the manufacturer must demonstrate either

- a) that there are *no* safety-related performances or characteristics which are likely to deteriorate over time (3a above), or
- b) that the *extent* of any likely deterioration (3b above) does not represent an unacceptable risk, or
- c) that the *period* over which unacceptable deterioration occurs is far beyond the likely time of the first use of the device (3c above), e.g. 30 years.

In doing so, the manufacturer must consider, amongst other

- materials of the device itself and those used in manufacture, including adhesives, coatings, packaging etc.
- methods of manufacturing, (e.g. attachment of components, package sealing process);
- methods of protecting the device or parts thereof from deterioration (e.g. packaging, storage instructions);
- if relevant, state in which the device is maintained prior to first use (e.g. without battery fitted)
- the potential for inherent time dependent material degradation (e.g. due to long term effects of sterilisation on materials such as that of free radicals from gamma irradiation leading to polymer degradation).

If the manufacturer cannot meet the requirements of either 4.2a or 4.2b or 4.2c above, a “use-by“ date must be given.

5. Examples

5.1 Cardiac catheter with latex balloon

[Only aspect considered in this example: time-related deterioration of the balloon]

A cardiac catheter incorporates a latex balloon to locate the catheter tip within, and temporarily occlude, a blood vessel. The ability of the balloon to withstand certain pressure is necessary for safe use. The latex of the balloon, however, deteriorates over time. The packaging and the storage instructions to protect the device from light reduce the rate of deterioration, but do not prevent it. It is therefore necessary to give a “use-by“ date.

The manufacturer must demonstrate that

- *the latex balloon remains able to withstand the relevant pressure over the claimed shelf life, when the device is stored in accordance with the manufacturer's instructions.*

5.2 Orthopaedic hip joint implant (supplied sterile)

[Only aspect considered in this example: time-related deterioration of the sterile packaging]

A metal and ceramic orthopaedic implant is supplied sterile in a composite plastic/paper unit container. The ability of the packaging to maintain sterility is necessary for safe use. Whilst the maintenance of sterility is in part event-related (i.e. a function of the actual storage and handling conditions), it is also a function of time, due to e.g. the reduction in flexibility and seal strength of the package material over a period rendering it more susceptible to the events which may compromise sterility.

Moreover, as such implants are available in a variety of sizes to suit different clinical applications, a particular device may remain in the store over a long time until needed for implantation.

It is therefore necessary to give a “use-by“ date. In the case of maintenance of sterility, the “use-by“ date will reflect a combination of

- a) the time-related deterioration in the performance of the pack, e.g. seal strength, seal integrity and resistance to penetration of particles carrying micro-organisms,*
- b) the probability of events occurring during transport and storage which compromise sterility, but are not evident and therefore where the warning not to use the device when the package is opened or damaged will not assist.*

The manufacturer must demonstrate that

- *the packaging material is able to maintain device sterility over the claimed shelf life, when stored in accordance with the manufacturer's instructions.*

5.3 Implantable cardiac pacemaker

[Only aspect considered in this example: battery lifetime]

An implantable cardiac pacemaker is supplied with a battery fitted and sealed into the device. Due to self-discharge, all batteries have a limited life even if not used. The period for which the battery maintains sufficient energy for the device to function as intended by the manufacturer following implantation is important to avoid the need for a surgical operation to explant and replace the device unnecessarily soon. It is therefore necessary to give a “use-by“ date.

The manufacturer must demonstrate that the battery retains sufficient energy to function for the manufacturer's claimed operating time even if implanted at the end of the claimed shelf life.