

# Frequently asked questions

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## Questions and answers on the mechanical MLC CobraLeaf®

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**1. How does CobraLeaf<sup>®</sup> perform Leaf-Movement without any motors?**

The CobraLeaf<sup>®</sup> contains a closed-loop pneumatic system, which is connected with a sealed air-container which acts as an “air-spring”. This innovative drive supplies a constant pressure to move the leaves towards their specific location in the field.

**2. What are the main properties of the CobraLeaf<sup>®</sup>?**

The CobraLeaf<sup>®</sup> is a single-focus, mechanical driven, power-independent Multileaf-Collimator for Cobalt-60 teletherapy. It is used for 3D conformal radiotherapy and can therefore replace custom made blocks. Its unique design makes it more reliable and cost-effective than any other Multileaf-Collimator.

**3. How are individual field shapes generated in CobraLeaf<sup>®</sup>?**

The result of the treatment planning, whether it is done with a computerized treatment planning system (TPS) or with a digitizer, the file (a contour for each treatment field) is transferred to a tabletop, stand-alone 2D-milling machine (CNC) which comes with the CobraLeaf<sup>®</sup>. A raw PMMA slab is then automatically shape into the individual field. In a quick and easy procedure, this “field template” is then mounted in the collimator and exchanged for each treatment position during treatment.

**4. How is the field form template inserted into the CobraLeaf<sup>®</sup>?**

A template holder, which is also equipped with electrical interlock for additional safety, will hold the individually milled shape and assure centralization and the right orientation. It will remain in the beam during irradiation, which results in filtering of the electrons from the source. The additional attenuation due to approximately 10mm of PMMA material in the beam will be accounted for in the dose calculation by adjusting the tray factor.

**5. How much time does it take to change from one field to the other?**

The time it takes to change the fields is crucial for a high patient throughput. For the CobraLeaf<sup>®</sup>, this should be roughly the same as changing the custom made blocks. Depending on the workflow in the clinic, an additional 15 seconds per field change plus the time it takes to enter & exit the room should be possible.

**6. Will there be an interlock to guarantee the application of the right fields?**

Yes, the individual field template is mounted on an electrically-coded holder, which will act as a pre-defined accessory specifically for the particular field of that particular patient. A printed label on the field template can be used for further safety.

**7. What is the material of the field templates?**

The field template is made out of clear PMMA slabs.

**8. What is the design of the leaves?**

The leaves of the CobraLeaf<sup>®</sup> are single focused with a partly rounded front side for minimal penumbra.

**9. Does the CobraLeaf<sup>®</sup> have focused leaves?**

Yes, the leaves have single focus with a partly rounded front side for minimal penumbra.

**10. What is the weight of the CobraLeaf<sup>®</sup>?**

The approximate total weight of the collimator is 45kg.

**11. How is the CobraLeaf<sup>®</sup> adapted to the Cobalt machine's head?**

The CobraLeaf<sup>®</sup> comes with a special adapter which slides directly in the "lower enclosure" of the therapy head so it will directly under the inbuilt jaws and allow for maximum clearance.

**12. Which machines can I adapt the CobraLeaf<sup>®</sup> on?**

In general, the adaptation is not specific to a machine, as it does not require electronic communication or external power. Currently the physical adapter is designed for Theratronics machines but is scheduled to be available for other machines very soon. Please contact us to find out if it is available for your machine as well.

(Please note, that the focusing of the leaves and its dosimetric properties are specific to the distance to the source)

**13. What is the clearance with the CobraLeaf<sup>®</sup>?**

The total height of the CobraLeaf<sup>®</sup> is approx. 120mm. The clearance is therefore decreased by this height. Therefore - for some treatments – non-isocentric irradiation techniques may be required.

**14. Where has the CobraLeaf<sup>®</sup> already been tested?**

During the development the CobraLeaf<sup>®</sup> was tested on various Theratronics machines in Germany and Canada. Please contact us for the up-to-date reference user list.

**15. What are the costs involved with the CobraLeaf<sup>®</sup>?**

As we focused on minimal costs from the first day of the development, the CobraLeaf<sup>®</sup> offers the chance to acquire a modern MLC for the cost of mold room equipment. Another advantage is, that there are no installation costs involved due to the electronic and mechanical independence + there are minimal or no maintenance costs.

Please contact your local distributor for a detailed quotation for your site.

**16. When will the CobraLeaf<sup>®</sup> be available?**

The scheduled worldwide availability is by the middle of 2013. Please contact your local distributor for more specific information.

**17. What is the leakage of the CobraLeaf<sup>®</sup>?**

The average leakage of the collimator is approximately 1.5% of the dose. Please find more detailed information on the dosimetric properties in the current scientific publications.

**18. Where can I find scientific studies on the CobraLeaf<sup>®</sup>?**

The first scientific publication was given during the AMPICON 2012 conference in Mangalore, India. Our information material contains a summary of the contents in the respective poster. Please contact us for the current compilation of scientific material available.

**19. How is the air container filled?**

The air container is filled with compressed air by an easy portable pneumatic pump (look & feel of any standard portable drill) which comes with the CobraLeaf<sup>®</sup>. This process takes about 1 minute and no further action is required for the set-up of the collimator as the air is now in a sealed closed-loop system.

**20. How can CobraLeaf<sup>®</sup> claim to be power-independent, if it has to be filled externally with compressed air?**

The trick is that the CobraLeaf<sup>®</sup> only has to be set up once by filling the air container! After that, it works without any external electrical or pneumatic power.

**21. Can't you connect the pneumatic system of the CobraLeaf<sup>®</sup> with the pneumatic system of the Cobalt-machine?**

Yes, we could. But we want the CobraLeaf<sup>®</sup> to be fully independent. Also the pneumatic system of the Cobalt-machine is crucial for a safe storage of the source in case of a power failure, so any interference with this may not be for the patient's benefit, which is the ultimate goal of any of our medical devices!

**22. Will I be able to use the light field with the CobraLeaf<sup>®</sup>?**

The collimator is orientated in such a way, that the light field can be used.

**23. Why should I choose the CobraLeaf<sup>®</sup> instead of custom made blocks?**

The main advantages of the CobraLeaf<sup>®</sup> collimator over the custom made blocks are the avoidance of a mold room, the better dosimetric features and the great enhancement of the workflow (Making the PMMA field template is much easier and quicker than foam cutting + melting, not to mention the aspects of storage and hazardous material.)

**24. Why should I choose the CobraLeaf<sup>®</sup> instead of a motorized MLC?**

The main advantages of the CobraLeaf<sup>®</sup> collimator over a motorized MLC are the tremendously lower costs, low maintenance costs (no motors to be replaced) and independence of software (TPS), electronics and reliable power supply.

**25. What is the purpose of the CobraLeaf<sup>®</sup> and why do you put development work into improving Cobalt-Radiotherapy?**

The purpose of the CobraLeaf<sup>®</sup> is to provide high quality radiotherapy also for patients, who are treated with Cobalt-Radiotherapy.

According to the IAEA, there are more than 2000 Co-60 machines in use worldwide and with an increasing number of cancer incidences in Low-and middle income countries, we recognize the need for an efficient (in terms of cost, time and reliability) treatment. Despite the effort the development of CobraLeaf<sup>®</sup> brought along, we still think the benefit in treatment is worth it.