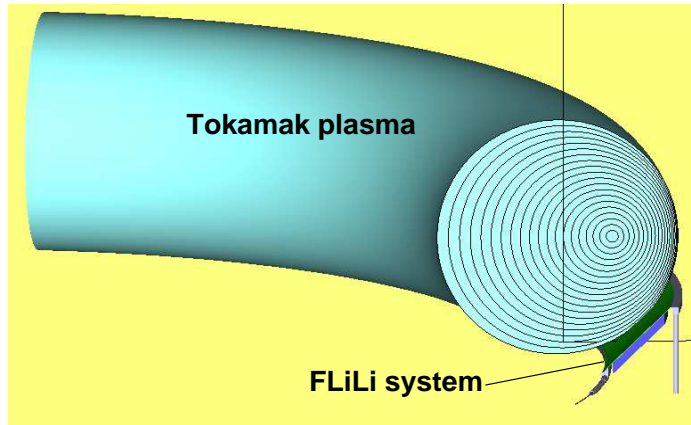


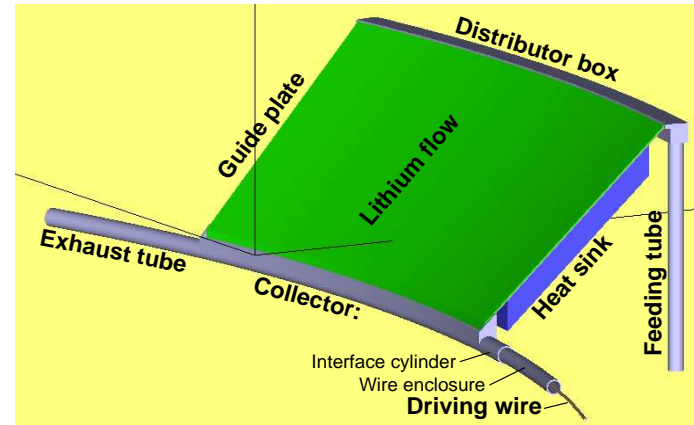
Flowing Liquid Lithium (FLiLi) System

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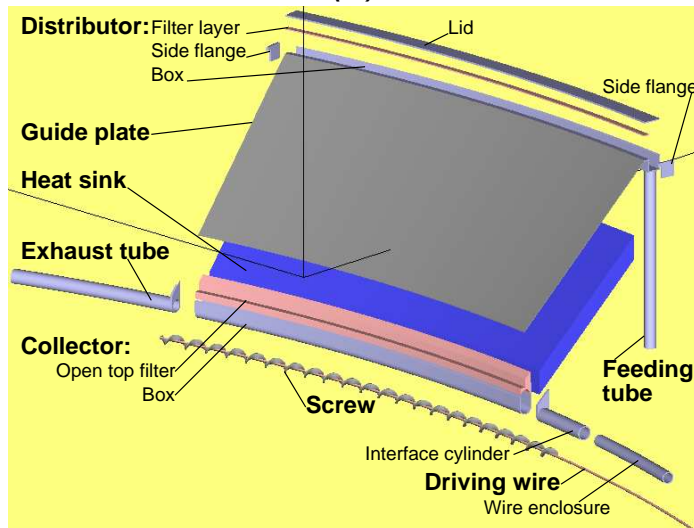
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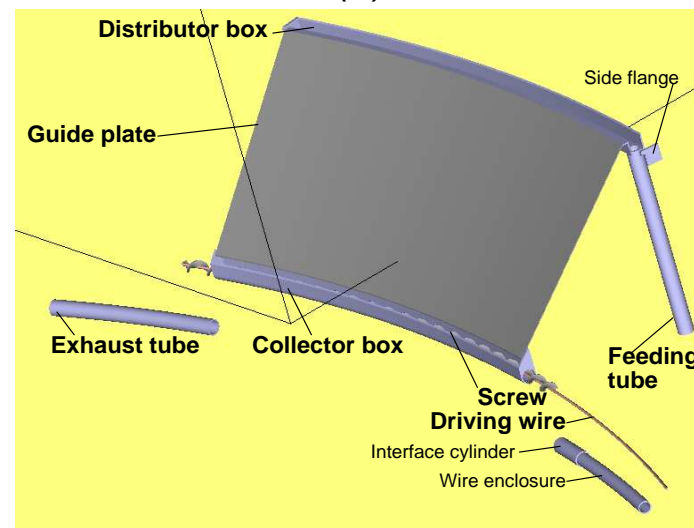
(a)



(b)



(c)

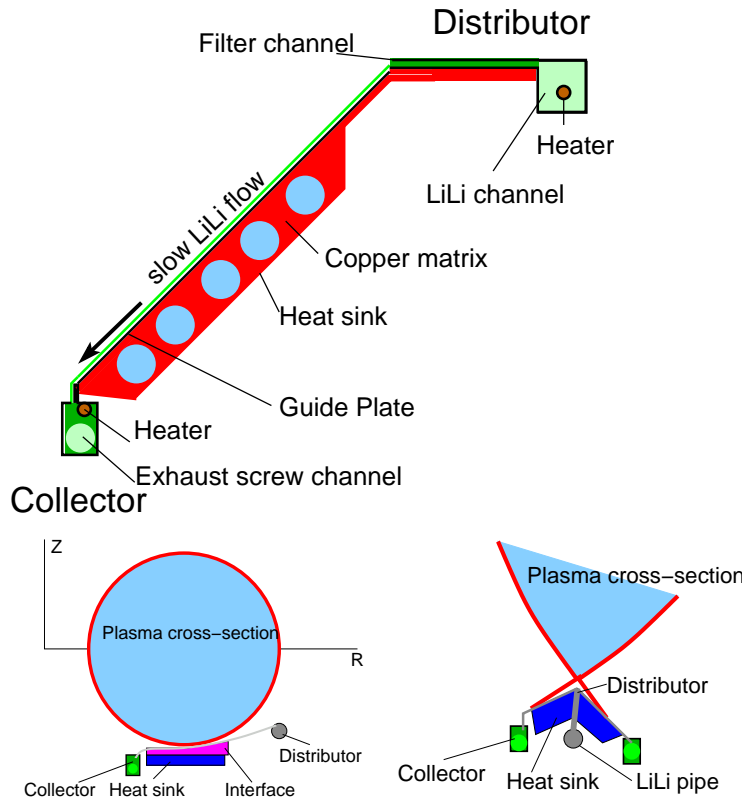


(d)

Conceptual design of the FLiLi system. (a) Example of FLiLi system as a limiter for a tokamak with a circular cross section (e.g., HT-7). (b) Assembly of distributor, feeding pipe, guide plate with LiLi flow (green), heat sink, collector and exhaust mechanism. (c) Separate parts of FLiLi system. (d) guide plated with open boxes of distributor and collector with a flexible screw lithium propelling mechanism.

$$V_{cm/s} = 0.2 - 1, \quad Q_{cm^3/s} = 1 - 2, \quad H_{mm}^{filt} = 1, \quad L_{cm}^{filt} = 2 - 10$$

$$\Delta p_{Pa}^{filt} = 1.6 \cdot 10^2 V_{cm/s}^{filt} L_{cm} B_T^2, \quad \Delta p_{Pa}^{dist} = 1.6 \cdot 10^2 V_{cm/s}^{dist} L_{cm} \frac{d}{w} B_{\perp}^2$$



Design requirement $\Delta p_{Pa}^{filt} > \Delta p_{Pa}^{dist}$

Good properties are countless:

1. FLiLi solves the problem of the Li surface contamination: open loop during machine operation, close loop overnight
2. Flow rate is under external control by pressure in the feeding pipes.
3. The system is scalable in both poloidal and toroidal direction, and from a laboratory test chamber to a real tokamak device.
4. Minimal in-vessel inventory of LiLi. LiLi is supplied from outside and is exhausted to outside the VV.
5. The bulk of LiLi is protected from plasma disruptions by the filter layer.
6. No side walls for LiLi flow, no leading edges.
7. Simple for maintenance, at the end of the campaign can be flushed out by argon and then by vinegar.
8. Is insensitive to yet unknown $j \times B$ forces.
9. Filter channel geometry and orientation is flexible.

FLiLi is compatible with any tokamak, including NSTX-U. The plasma regime, it can provide, is beyond the dreams.

FLiLi is simply amazing.