**PREMP (Pressure systems) Cheat sheet**

**Sample Environment Systems:**

1. **Gas, liquid, clamp cells**

Status: preliminary design complete, detailed design pending IK deal.

Current cell suite:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cell class** | **material** | **ID (mm)** | **OD (mm)** | **K** | **MOP\* (MPa)** |
| **Gas** | TiZr | 10 | 30 | 3 | 437 |
|  | TiZr | 7 | 21 | 3 | 437 |
|  | Al | 10 | 30 | 3 | 362 |
|  | Al | 7 | 21 | 3 | 362 |
|  | CuBe2 | 7 | 21 | 3 | 714 |
| **Liquid** | TiZr | 10 | 30 | 3 | 437 |
|  | TiZr | 7 | 21 | 3 | 437 |
|  | Al | 10 | 30 | 3 | 362 |
|  | Al | 7 | 21 | 3 | 362 |

1. **Paris-Edinburgh cells**

Status: preliminary design complete, detailed design pending IK deal.

Includes:

* 2 VX-type PE cells, both capable of vertical and horizontal geometries
* A dedicated PE cryostat (spec not defined)
* Gas loading capability for PE cells and other HP devices

Supported by this anvil inventory:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Anvil type** | **Maximum operating pressure (MOP)** | **Cycles to failure**  **75% MOP** | **Cycles to failure**  **100% MOP** | **suite** |
| **Single toroid WC** | 10 | 40 | 15 | 0 |
| **Single toroid ZTA** | 7 | 40 | 15 | 5 pairs\* |
| **Single toroid cBN** | 9 | 40 | 15 | 4 pairs |
| **Double toroid SD** | 20 | 20 | 10 | 2 pairs |

Also have a plan to develop an alternative anvil geometry with greater angular aperture (standard PE anvils limited to ± 7°)

1. **Diamond anvil cells**

Status: Primary design complete and hot commissioned. Continuing to work on new concepts

* 4 ORNL type membrane driven DACs, and ~10 pairs of anvils.

**Lab and Ancillary Support Systems:**

1. Gas and hydraulic laboratory supporting PE, gas, liquid and clamp cells. Including calibrated presses, manual and automatic pumps, pressure measurement, tooling for custom pressure systems
2. DAC laboratory able to fully support DAC (and other small sample) loading inc: Ruby pressure measurement, gasket hole drilling (Ø1.00 to Ø0.15 mm).
3. Scanning system for (λ-dependent) beam profile characterisation and alignment