Contrasting free (Joule) & QuasiStatic expansion

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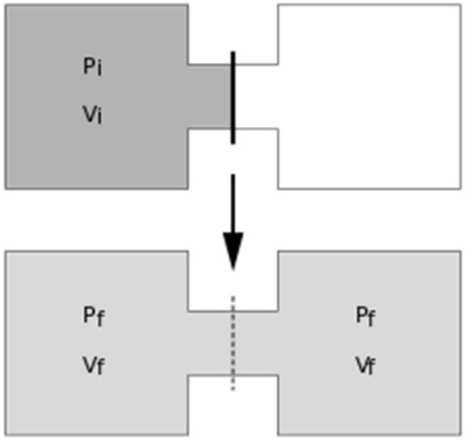
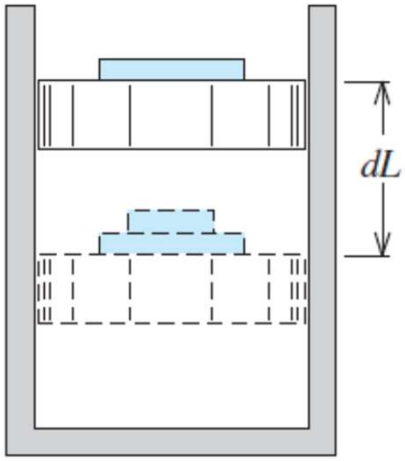
Generalized forces & displacement

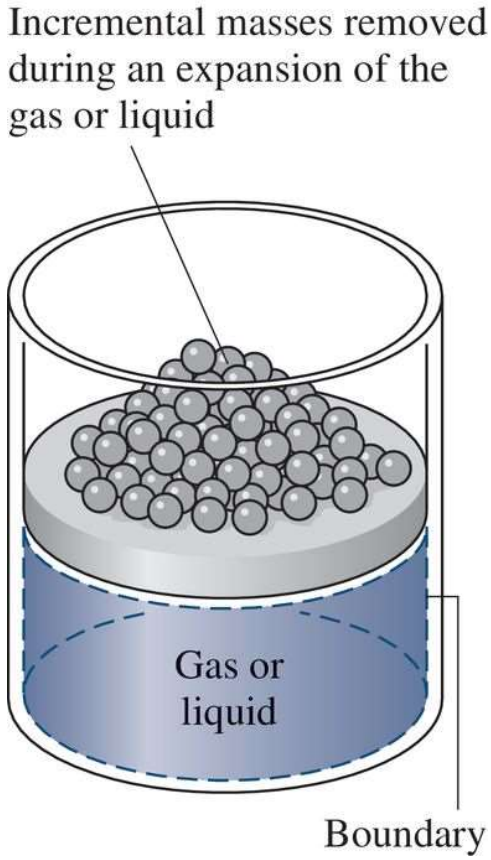
- W=p*dV-σ*d(A)-v*dq-μH*d(vM) -E*d(vP)...
- Generalized force-Intensive
- Generalized displacement-Extensive
- "Reversible transformation": Infinitesimal...While undertaking Cyclic transformation both the system & surrounding should come to the same state...All *states* should be represented in the state diagram during the transformation

Quasi-Static PV work transformation

- Free expansion or Joule expansion
- TD variables cannot be defined during Free/Joule expansion
- "Reversible transformation": Infinitesimal...All *states* should be represented in the state diagram during the transformation







https://en.wikipedia.org/wiki/Joule_expansion
Fig: Borgnakke & Sonntag: TD, Moran & Shapiro: TD