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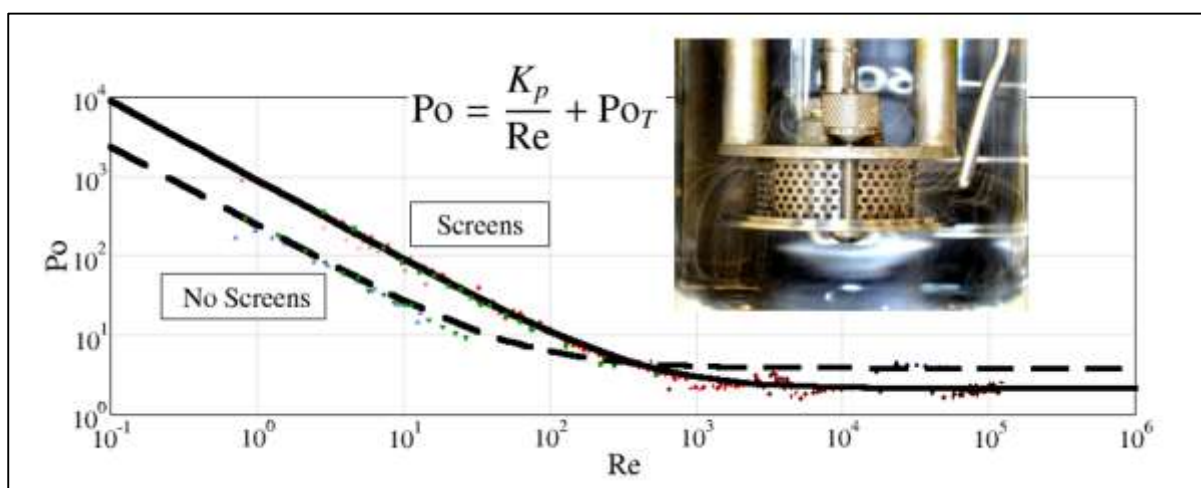
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Graphical abstract



Highlights

- Power constants can be calculated repeatably from torque data
- Batch rotor-stator mixer power number can be given by $Po = K_p/Re + Po_T$
- Removing the screens increases the turbulent power number, decreases the laminar power constant, and decreases the Metzner-Otto constant.
- The laminar power constant and the Metzner-Otto constant increase with increasing scale
- The turbulent power number is dependent on the flow area

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