Take the HVAC CHALLENGE™

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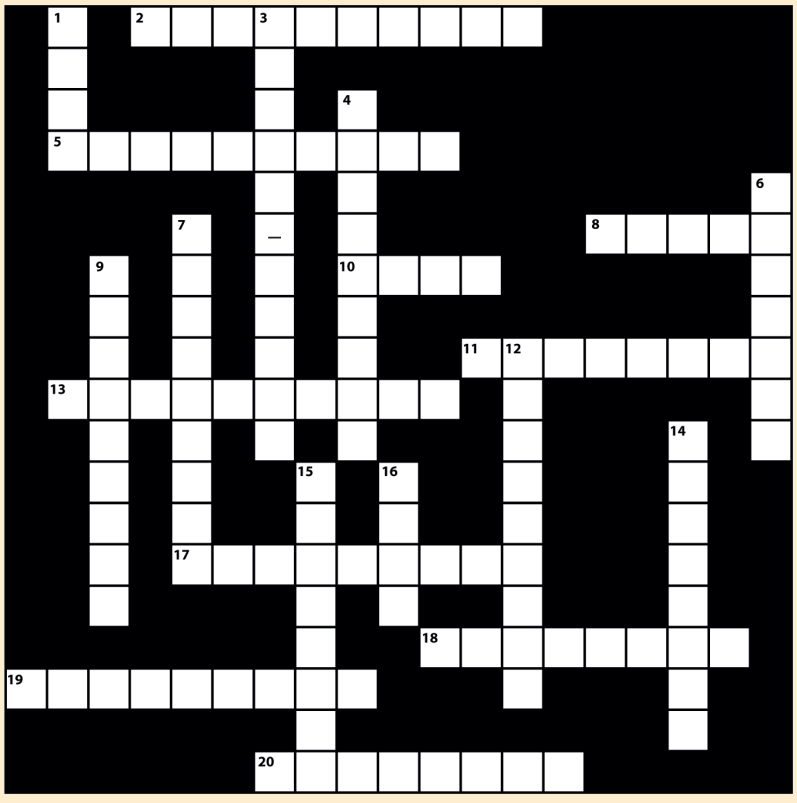
Fluid Flow



ACROSS

2. Sensitivity of a device to cavitation is measured by this index.
5. The pressure difference between this point (total pressure) and that in the ambient fluid stream (static pressure) is used to give a point velocity measurement.
8. This loss prediction is appropriate when an expansion flow, such as from one conduit size to another or at the exit into a room or reservoir, is not included in an analysis.
10. The numeric number that represents the ratio of flow velocity to speed of sound.
11. When this loss is included, incompressible flow analysis applies to compressible fluid analysis until the pressure drop exceeds about 10% of the initial pressure.
13. This region between laminar and turbulent flow occurs when 2,000 < Re < 10,000
17. In these fluids, the rate of deformation is directly proportional to the shearing stress.
18. Liquid flow with gas-filled or vapor-filled pockets can occur if this pressure is reduced to vapor pressure of less.
19. Flow with a Reynolds number greater than 10,000.
20. Laminar and turbulent flows can be differentiated by using this dimensionless relative ratio of internal forces to viscous forces.

DOWN

1. Flow in a system involves interaction between the characteristics of the flow-producing device and these characteristics of the pipeline or duct system.
3. The simplest model used to describe fluid motion.
4. This viscosity is the ratio of absolute viscosity to density.
6. Flow with a Reynolds number less than 2,300.
7. The compressibility effect is often accounted for in this factor.
9. The diameter that is given the term D_h
12. With turbulent flow, friction loss depends not only on flow conditions as characterized by the Reynolds number, but also this height of the conduit wall surface.
14. In a compressible fluid, this velocity is usually high and the conduit length is rather short, so the time of signal travel is negligibly small.
15. The length represented by L_e
16. This small section (contracta), generally has a limiting area of about six-tenths of the orifice opening.

To brush up on the facts behind this month's clues, refer to Chapter 2 ("Fluid Flow") in the *2005 ASHRAE Handbook – Fundamentals.*

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