Formula 1

Content placeholder

Formula 2

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Formula 3

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Detailed Explanation

ISO 14383 provides a graphical and procedural methodology rooted in empirical and semi-empirical hydrodynamic research, consolidating decades of experimental data from two-phase flow studies. It defines regime boundaries using key dimensionless groups—including the liquid and gas Froude numbers, Lockhart–Martinelli parameter (X), and viscosity ratio—to account for gravitational, inertial, and interfacial forces governing phase distribution. The flowchart is structured hierarchically: users first classify pipe inclination (vertical, near-vertical, horizontal/inclined), then compute required dimensionless numbers, and follow branching logic to assign one of up to eight defined flow regimes. Its standardization ensures interoperability across engineering software, regulatory assessments, and operational procedures—particularly where pressure drop prediction, erosion risk, or separation efficiency depends critically on accurate regime identification. While primarily intended for steady-state, adiabatic, non-reactive gas-liquid flows, ISO 14383 includes guidance on applicability limits and cautions regarding high-viscosity liquids, foaming systems, or three-phase (gas–oil–water) flows where supplementary models may be needed.

Key Components

#	Component

1	Inclination-based classification tree
2	Dimensionless parameter calculation module (Fr_L, Fr_G, X, ?)
3	Regime boundary correlation maps (e.g., Taitel–Dukler extensions)

Applications

#	Application
1	Design and sizing of multiphase pipelines in upstream oil & gas
2	Selection of appropriate pressure drop and holdup correlations in process simulators
3	Risk assessment of flow-induced vibration and liquid slugging in subsea tiebacks

Related Concepts

#	Concept
1	Two-phase flow modeling
2	Taitel–Dukler flow regime map
3	Multiphase flow metering

Tags

> multiphase flow, ISO standard, flow regime