PRIMARY ELEMENT **SELECTION GUIDE**

Primary elements allow to cover a very wide range of applications.
The below table will help you select the most suitable solution for your installation.

REYNOLDS NUMBER Re_D

$$Re_D = \frac{V_1 D}{\nu_1} = \frac{4 q_m}{\pi \mu_1 D}$$

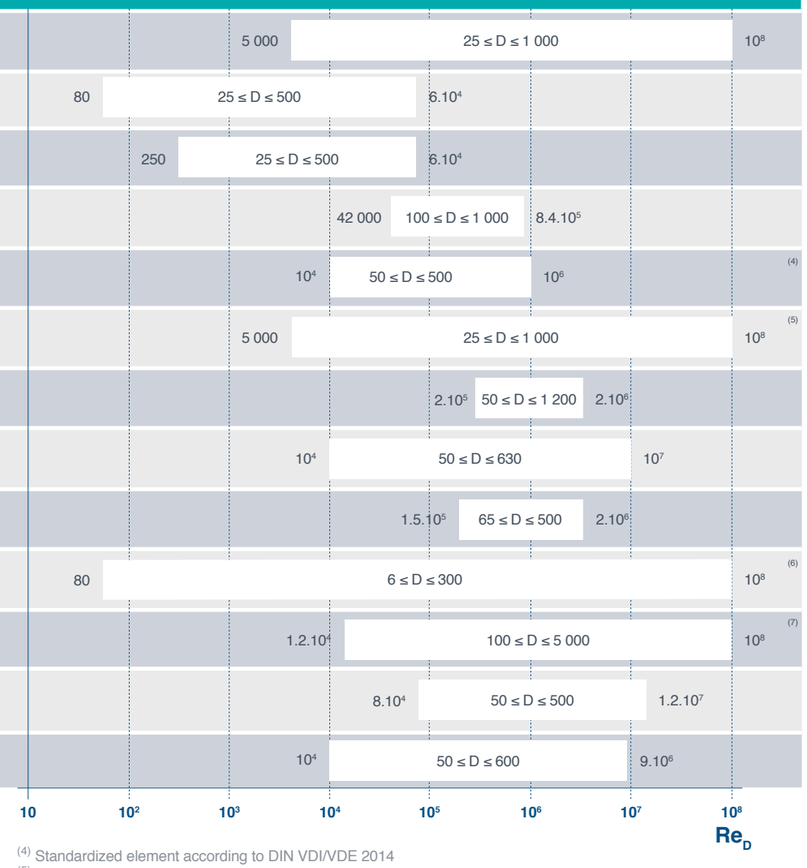
V_1 fluid velocity in m/s
D pipe internal diameter in m
ν_1 kinematic fluid viscosity in m²/s
q_m mass flow rate in kg/s
μ_1 dynamic fluid viscosity in Pa.s

The Reynolds number (Re_D) is a dimensionless parameter which expresses the relationship between the inertia and viscosity forces in a pipe. It qualifies the type of flow (laminar, transient or turbulent).

The below table provides the Reynolds number limitations and the recommended pipe diameter as per the standards. It is possible to extend these values by performing a calibration of the device concerned.

recommended
adapted

		GAS		LIQUID				STEAM	STANDARDIZED VALUES ACCORDING ISO 5167 & ISO/TR 15377: - Reynolds number Re_D - Internal diameter of the pipe D, in mm	MAIN ADVANTAGE	PAGE
		CLEAN	DIRTY	CLEAN	DIRTY	VISCOUS	AGRESSIVE				
ORIFICE PLATE	SHARP EDGE[1]	✓✓		✓✓			✓ [2]	✓✓ [2]	5 000 — 25 ≤ D ≤ 1 000 — 10^8	Economical and reliable	10
	CONICAL ENTRANCE[1]	✓				✓✓	✓ [2]	✓✓ [2]	80 — 25 ≤ D ≤ 500 — 6.10^4	Low flowrate and/or viscous fluid	11
	QUARTER CIRCLE[1]	✓	✓	✓	✓	✓✓	✓ [2]	✓✓ [2]	250 — 25 ≤ D ≤ 500 — 6.10^4	Viscous fluid	12
	ECCENTRIC[1]		✓✓		✓✓		✓ [2]	✓ [2]	42 000 — 100 ≤ D ≤ 1 000 — $8.4.10^5$	Dirty, charged or two-phase fluid	13
	SEGMENTAL[1]		✓✓		✓✓		✓ [2]	✓ [2]	10^4 — 50 ≤ D ≤ 500 — 10^6 [4]	Dirty, charged or two-phase fluid	14
	CONDITIONING[1] SHORT STRAIGHT LENGTH	✓✓		✓✓			✓ [2]	✓✓ [2]	5 000 — 25 ≤ D ≤ 1 000 — 10^8 [5]	Short straight length (2D/2D)	15
	VENTURI TUBE SHORT STRAIGHT LENGTH	✓✓	✓	✓✓	✓		✓	✓	2.10^5 — 50 ≤ D ≤ 1 200 — 2.10^6	Short straight length and low permanent pressure drop	16 à 18
	NOZZLE	✓✓	✓	✓✓	✓	✓	✓✓ [2]	✓✓ [2]	10^4 — 50 ≤ D ≤ 630 — 10^7	Large flowrate	19 - 20
	VENTURI-NOZZLE	✓✓	✓	✓✓	✓	✓	✓✓	✓✓	$1.5.10^5$ — 65 ≤ D ≤ 500 — 2.10^6	Large flowrate and low permanent pressure drop	21
	METER RUN[3]	✓✓		✓✓	✓	✓	✓	✓✓	80 — 6 ≤ D ≤ 300 — 10^8 [6]	High accuracy	22 à 24
	PITOT TUBE	✓✓		✓✓		✓			$1.2.10^4$ — 100 ≤ D ≤ 5 000 — 10^8 [7]	Wide pipe and very low pressure drop	26
	CONE METER SHORT STRAIGHT LENGTH	✓✓	✓	✓✓	✓		✓	✓	8.10^4 — 50 ≤ D ≤ 500 — $1.2.10^7$	Short straight length	27
	WEDGE METER		✓✓		✓✓	✓✓	✓✓	✓	10^4 — 50 ≤ D ≤ 600 — 9.10^6	Fluid charged with impurities	28



[1] All of these primary elements can be integrated in a compact flowmeter version - see page 25.
[2] For a very corrosive / abrasive fluid, provide a resistant material and / or a coating protection on the edge of the restriction : stellite coating, ceramic projection.
[3] The meter run is a complete solution including the primary element, gaskets, flanges, pressure taps, upstream and downstream straight lengths… see page 23.
Special meter run :
- Integrated orifice for diameters up to 40 mm - see page 22.
- High precision measurement tube with differential pressure transmitter and temperature sensor if needed for the most accurate measure of the market - see page 24.

[4] Standardized element according to DIN VDI/VDE 2014
[5] Non standardized element, recommended Re_D and D ranges
[6] From 6 to 40 mm, standardized element according to ASME MFC-14M
[7] Standardized element according to ASME MFC-12M