

# Process Design of Oil and Gas Separators and Scrubbers

API RECOMMENDED PRACTICE 12J  
NINTH EDITION, SEPTEMBER 2024



American  
Petroleum  
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# Process Design of Oil and Gas Separators and Scrubbers

## 1 Scope

This recommended practice provides requirements and recommendations for the process design of pressure-vessel-based gas–liquid and gas–liquid–liquid separators operating on static facilities and facilities subject to motion such as floating production, storage, and offloading (FPSO) and tension leg platforms. Separators covered by this document may be vertical (e.g. scrubbers, knockout drums) or horizontal (e.g. free water knockout) and are limited to those containing conventional, longstanding, separation internals such as inlet devices, mist eliminators, agglomerators, and distribution baffles. Other internals such as solids jetting systems are addressed by company requirements and/or technology supplier designs.

As instrumentation is a key part of separator design, guidelines are given for the pressure, temperature, and level sensors necessary for separator process control and troubleshooting.

While there are well-established mechanical design codes for pressure vessels, the process and mechanical designs are related and as such should not be performed as separate exercises. General steps in establishing the parameters to consider when designing the mechanical aspects of the separator are also included.

Separators outside the scope of this document include spherical separators, flare knockout drums, electrostatic separators, inline separators, mono-cyclone separator, filter separators, de-oiling equipment, and de-sanding equipment.

## 2 Normative References

No other document is identified as indispensable or required for the application of this standard. A list of documents associated with API 12J are included in the Bibliography.

## 3 Terms, Definitions, Abbreviations and Symbols

### 3.1 Terms and Definitions

#### 3.1.1

##### **company**

The organization that specifies and purchases a separator for their own use or an intermediary that specifies and purchases the separator for an end user. An intermediary can be a contractor, a packager, a manufacturer, or another similar entity.

#### 3.1.2

##### **technology supplier**

The organization that designs the internal components for a separator and may also provide the complete process design for the separator.

### 3.2 Abbreviations and Symbols

$A_1$	liquid film flow cross-sectional area (m <sup>2</sup> )
$A_{g,h}$	horizontal vessel gas space area (m <sup>2</sup> )
$A_{g,v}$	vertical vessel cross-sectional area (m <sup>2</sup> )
$A_N$	inlet nozzle area (m <sup>2</sup> )