



# Asphaltene Stability Using TURBISCAN LAB following ASTM D7061

## CONTEXT

The stability of **asphaltene**-containing crude oils is critical for refining, transportation, and storage. Instability can lead to flocculation and phase separation, resulting in operational issues such as fouling, sludge formation, and blending incompatibilities.

ASTM **D7061** is a widely used method to evaluate the stability reserve of heavy fuels and crude oils. It relies on asphaltene destabilization induced by the addition of *n*-heptane. The resulting flocculation and sedimentation are monitored through the evolution of optical transmittance profiles using **TURBISCAN**-based instruments (CLASSIC, HEAVY FUEL, or OIL SERIES). Results are expressed as the **Separability Number (SN)**, which quantifies the tendency of a sample to phase separate over time.

| Separability number | Oil Stability Reserve |
|---------------------|-----------------------|
| High                | Poor                  |
| Low                 | High                  |

Based on the same measurement principle as ASTM D7061, **TURBISCAN LAB**, as a new-generation instrument, provides results correlated

with Separability Number (SN) values while offering enhanced sensitivity to early destabilization phenomena within the standard **15-minute test** duration.

## EXPERIMENTAL RESULTS

**Five crude oils** were analyzed. Sample preparation was performed following **ASTM D7061** protocol:

- ✓ Dilution of crude oil in toluene following ASTM D7061 recommendation
- ✓ Addition of *n*-heptane
- ✓ Rapid transfer of the mixture into the measurement cells: 7mL in TURBISCAN CLASSIC OIL SERIES and 25mL in the TURBISCAN LAB vials.
- ✓ Recording transmission and backscattering values all over the sample height every minute for 15 minutes in both instruments.

The figure below represents the transmission (top graph) and backscattering (bottom graph) variation as a function of the sample height for Crude oil 4. The first scan is shown in blue and the final scan in red, enabling visualization of the destabilization phenomena occurring over time.