

## HYDROCARBON

### Typical end products

High-end and intermediate feedstocks: diesel fuel, jet fuel, naphtha, gas oil, coker feed

### Introduction

Hydrotreating is a refining process used to purify and saturate olefins and aromatics in all final and intermediate refinery feedstocks. These include diesel, jet fuel, naphtha, gas oil, and coker feed. The impurities removed include sulfur, nitrogen and metals. The purpose of saturating the olefins and aromatics is to reduce their presence in the hydrocarbons, and to improve the feed stock to the other refinery processes such as the catalytic cracker. The process also has the benefit of mild cracking of heavier components.

### Application


The hydrocarbon is mixed either with hydrogen or a hydrogen enriched gas and is then heated before entering the reactor. There, the hydrogen reacts with any sulfur to form hydrogen sulphide or with any nitrogen to form ammonia. Any free hydrogen is then available to react, saturating the aromatic and olefin compounds. This reduces the total percentage of aromatics and olefins in the feed.

The K-Patents Process Refractometer PR-23-GP provides a real-time in-line indication of the aromatic content of the hydrocarbon stream. There is a well defined relationship between the Refractive Index and the aromatic content of hydrocarbons. The typical measurement range is between 1.400 and 1.4630 at 25°C (77°F).

### Installation

The K-Patents refractometer is most effective when mounted in the hydrotreater feed stream or when measuring the final product. The output signal from the K-Patents refractometer is used to adjust either reactor temperature, hydrogen make-up ratio or the feedstock blend to achieve the required aromatic ratio.

Appropriate equipment with hazardous and intrinsic safety approvals are available when required. For sensor wetted parts stainless steel 316L SS can be used, unless conditions require the use of special materials. Automatic steam prism wash is recommended.

| <b>Instrumentation</b>  | <b>Description</b>  |
|---|---|
|  <p>The image shows the K-Patents Process Refractometer PR-23-GP. It consists of a white rectangular electronic display unit with a small screen showing the number '25.31'. Attached to the bottom of the unit is a stainless steel probe with a red, cylindrical, threaded section at the end, which is used for clamping onto a pipe or tank.</p> | <p>K-Patents Process Refractometer PR-23-GP is an industrial refractometer for large pipe sizes and tanks, cookers, crystallizers and kettles. Installation through a flange or clamp connection.</p> |
| <p>Area classification:</p>   | <p>Intrinsic safety and hazardous area approvals available.</p>   |
| <p>Measurement range:</p>   | <p>Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 % by weight.</p>   |