Engineering solutions for people, by people

CONSER helps organizations achieve the highest standards of manufacturing excellence with an integrated comprehensive approach to process design and safety.

With over 45 years of experience in the industrial sector, CONSER is able to deliver innovative and creative solutions tailored to the client needs.

Some of the services provided by CONSER process department are basic design, Operation analysis, do bottlenecking and revamping and RMA.

In addition to a unique portfolio of petrochemical licenses and technologies, CONSER is now able to provide additional industrial consulting services like HSE, Energy Saving opportunities, and solution for the mitigation of the environmental impact of plant operations.

Leading the change in the process engineering design

CONSER, as an independent process engineering design company, is devoted to the build up and license of advanced technologies. We focus on processes development, driving forward to meet customer requirements.

CONSER stands out in the scene of Italian process engineering companies for its faith in research, shown by its countless investments in this field. The company reputation and success is confirmed by the excellent performances of the plants brought on stream following its design and the satisfaction of the clients that have chosen CONSER.

With the aim to provide a service with optimum quality characteristics, all the project phases are managed. Starting with feasibility studies, process development, licensing of processes and know-how transfer, process design, package preparation, supervision of detailed engineering and construction, we follow our client up to and including assistance to initial startup. This is valid both for new plants and for existing plants which require debottlenecking to improve performances and enhance profitability.
**Butyl and Halobutyl-Rubber - process introduction**

Butyl rubber (IR) is an elastomeric copolymer of isobutylene and isoprene generally offered in a wide variety of polymer grades. Halogenating the isoprene groups of the IR produces a rubber, which constitutes the main building blocks of several elastomers such as NR (Natural Rubber), BR (Butadiene Rubber) and SBR (Styrene-Butadiene Rubber) while preserving the essential properties of the original IR.

In several applications, the halogenated version of the rubber, like Bromobutyl (BIR) or Chlorobutyl (CIR) rubbers are preferred due to their easier vulcanisation and finishing. The IR thanks to its high retention to gas and liquids, excellent mechanical properties preserved in a wide range of temperature, good resistance to fatigue, and an elevated resilience to most chemicals, find a large spectrum of application like, among others:

- Tire curing blocks
- Adhesives
- Protective clothing
- Sealants
- Fuel additives
- Vibration damping devices

**Butyl and Halobutyl-Rubber - process features**

The major characteristics of the CONSER IR / HIR process are:

- Advanced product quality and properties
- Low utility consumptions and feedstock optimisation
- Safe and reliable design
- Extended catalyst life
- Lower emission and reduced environmental burden

The IR/HIR CONSER technology has been developed on the worldwide well-established slurry-polymerisation process, practised by the international leading butyl-rubber producers with the support of experienced experts and consultants in order to guarantee the highest standards of quality and efficiency.

**Butyl and Halobutyl-Rubber - product specification**

Information available upon request, please email us at conses@consenspa.com

**Butyl and Halobutyl-Rubber - references**

The high quality of CONSER IR process permitted to CONSER to assure a leading position as independent licensor proven by following reference list:

<table>
<thead>
<tr>
<th>Company</th>
<th>Location</th>
<th>Plant Capacity (t/yr)</th>
<th>Rubber Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHANGBRO</td>
<td>China</td>
<td>5000</td>
<td>IR / BIR</td>
</tr>
<tr>
<td>SIRCHES</td>
<td>China</td>
<td>10000</td>
<td>IR / BIR</td>
</tr>
<tr>
<td>SYNTHOS</td>
<td>Europe</td>
<td>10000</td>
<td>IR / BIR</td>
</tr>
<tr>
<td>YNCC</td>
<td>China</td>
<td>10000 (3 steps)</td>
<td>IR / BIR</td>
</tr>
<tr>
<td>SIR</td>
<td>Korea</td>
<td>5000</td>
<td>IR / BIR</td>
</tr>
<tr>
<td></td>
<td>Italy</td>
<td>3000</td>
<td>IR</td>
</tr>
</tbody>
</table>

**process description**

The butyl rubber technology offered by CONSER is based on the following main steps:

- Polymerisation
- Recycle compression and purification
- Finishing

**Polymerisation**

The butyl rubber is produced by copolymerizing isobutylene with a small amount of isoprene in a solution with methyl chloride, at low temperature (close to -30°C) and with aluminium chloride as a catalyst. In the flash vessel, water replaces the organic solvent, thus producing a water slurry that is subsequently sent to the finishing section.

**Recycle compression and purification**

Unreacted monomers and solvent are flashed, compressed, dried and fractionated in a sequence of distillation columns to recover solvent and isobutylene, both recycled to the polymerization section, while the reduced amount of impurities are purged out.

The solvent recovery unit has been optimized in order to achieve a higher degree of solvent recovery, an extended life for the drying agent and limiting the utilities consumptions and gas emissions.

**Finishing**

The water polymer slurry from the reaction section is sent directly to the finishing, where it is dried, pressed, baled and packaged.

The finishing line guarantees a strict quality control of the final product including: colour, general physical and mechanical properties.

**HIR Process**

Part of the water polymer slurry from the polymerization is fed to the halogenation section. Here the water is replaced with halogen to produce a polymer solution which is fed also to the halogenation reactors and then to the neutralization system.

The halogenate is removed and replaced again with water.

The water slurry is dried, pressed, baled and packaged in a second finishing line.