Thermo Engineering Supply Corporation

Our polyurethane
your Green Future

www.apu.com.sg
APU was established since 1985, with a fully equipped facility to tailor polyurethane systems to the needs of our customers. Our products are supplied to our diversified customer base in more than 40 countries all over the world.

In 1995, APU had the honour of being the first polyurethane system house in Asia to be formally accredited with ISO 9001. This accreditation serves as an assurance of the commitment of APU to research and development, quality of product and quality of service. Safety and environmental preservation is equally important to APU and to meet these goals we are also certified to ISO 14001 and OHSAS 18001.

APU has further shown its commitment as a polyurethane company by providing excellent services, innovative products and promoting a creative and innovative culture within the organization. These certifications such as Singapore Quality Class, Service Class, Innovation Class and People Developer have raised our level in term of our service standards; quality and number of new innovative products, as well as improving our cost-effective customize solutions.

To promote the use of polyurethane materials in the construction industry, APU was involved in a project for the first domestic dwelling house. This construction was awarded “Green Mark” under the Singapore Building and Construction Authority scheme, combining recycled and energy saving materials. APU is also certified with Green Label for its product and this has further enhances APU position to go into the “Green” industry.

APU continually strive to reduce cost of customers’ operation by the supply of systems that enhance the productivity or improve on the properties of the polyurethane system. Our partners and customers’ expectation has increased towards better quality, cost-effective products and prompt delivery. As such, APU has to be more nimble, flexible, and service orientated towards our customers and partners. We will continue our journey for business excellence, quality, safety and environmental consciousness.
ADVANCED TECHNOLOGY

Tailored systems
APU brings the latest technology to our customers by having an intimate understanding of the needs and tailoring the system to meet these requirements. This guarantees that our system will run efficiently at our customers’ sites.

Environmentally friendly systems
APU has pioneered and promoted the use of environmentally friendly blowing agents. A variety of blowing agent options is available. We offer systems based on raw materials from renewable resources.

Fully equipped development laboratory
Our laboratory is fully equipped for research and development, testing of qualitative, mechanical and physical properties, and quality control. Production scale high and low-pressure machinery are available for simulation of processing at customers’ conditions during the development phase.

Testing facilities
APU offers in-house testing facilities to our customers that may need reference readings of properties to ensure quality of their production is maintained. This ensures that the quality of our customers’ product will meet their specifications.
Quality control
Our quality control department maintain a tight control of product quality. All incoming raw materials are subjected to stringent quality checks to ensure compliance prior to acceptance. Each batch of outgoing blended system undergoes strict quality assurance checks to ensure trouble free production at our customer sites.

Production facilities
Our production department is fitted with the latest in polyurethane system blending technology. This includes automation and computer controlled stocking items. This ensures that our customers receive a consistent quality product that will offer trouble free processing.

Technical service
APU offers the services of our polyurethane technologists during trials of new materials, at times of production problems and on a regular basis to update customers on new trends, products or production methods.
RIGID FOAM

Rigid polyurethane foam finds its main uses in the area of thermal insulation. One of the reasons for this is the very high insulation efficiency, the highest of any commercial insulating material. Other reasons are the ease of use, the ability for the polyurethane foam to enhance the overall strength of the structure, the low water absorption, excellent adhesion and thermal stability between minus 160°C to 130°C.

APU can supply systems with a variety of environmentally friendly blowing agent technologies, including hydrocarbons and the latest HFA materials.
INDUSTRIES

Food chain
- Insulation of fishing vessel hull and storage areas
- Ice boxes for commercial and domestic purposes
- Cool storage rooms
- Refrigerated containers
- Refrigerated trucks/transportation
- Commercial refrigerated showcase
- Domestic refrigerators

Commercial and domestic building
- Hospitals
- Shopping centres

Specialty pipeline
- Insulation of sub-sea oil pipelines
- Pipe jointing system for protection of welded joint areas

Chemical storage tank insulation
- Brewery tank insulation
- LNG/LPG tankers
- Ammonia storage tanks

Other applications
- Floatation buoys
- Hot water heaters
- Pontoon
- Air filter rims
- Photo/mirror frames
- Cornices/ceiling roses
- Surfboard
HIGH RESILIENCE COLD CURE FOAM

Flexible polyurethane foam are one of the most versatile product types ever created. Every day we are surrounded by it in our life, from the mattresses that we sleep on to the seats in our cars, to the chairs we sit on at work. Polyurethane is the material of choice for cushioning materials for the furniture, bedding and automotive industries.

APU is able to offer a full range of low and high resilience flexible foam, based on full MDI or TDI/MDI mixtures.
INDUSTRIES

Automotive
- Car seats
- Head rests
- Sun visors
- Under-carpet sound insulation
- Firewall
- Headliner
- Motorcycle saddles
- Bicycle seats

Furniture
- Mattresses/pillows
- Sofa
- Theatre seat cushions
- Office chairs

Toys
- Balls
- Figurines
INDUSTRIES

Automotive
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SEMI RIGID INTEGRAL SKIN

A special range of flexible microcellular polyurethane foam that incorporate a high-density skin with a low-density foam core. The skin and core are formed in one single moulding process. The nature of polyurethane processing allows for inserts or structural components to be included during the moulding process.

A full range of systems is available offering a Shore A hardness range of 25 to 94 and density up to 1,100kg/m³ (RIM). Systems for HCFC141b, cyclopentane and water blown processing are available.
INDUSTRIES

Automotive
- Steering wheels
- Exterior trim
- Gear knob
- Bumper
- Spoiler
- Window encapsulation
- Mud flaps
- Air filter rims
- Bicycle seats

Furniture
- Arm rests
- Chair legs

[Images of various automotive and furniture items]
SPECIALTY PRODUCTS

Polyurea
Polyurea coating have a very fast reactivity and cure rate. During application there are moisture and temperature insensitive. The coating has good chemical and water resistance, excellent adhesion and high abrasion resistance. They are suitable for coating over concrete, wood and metal. Polyurea coating find use in many applications such as car park flooring, truck bed liners, sewer lining, theme park design, roof coating, tank lining and bridge coating.

Elastomer
Single or two component high-density materials with an extremely broad hardness range. From material as soft as an eraser to hard bowling ball. Because of its remarkable abrasion resistance, parts made from polyurethane will often out-wear rubber, plastic, and metal by margins up to 20 to 1. With its high-flex life, cut-resistance, load-bearing capacity and outstanding resistance to weather, ozone, oxygen and radiation, polyurethane elastomers provides unlimited design opportunities. Some common applications for polyurethane elastomers are seals and gaskets, roller coverings, scraper blades, chute linings, internal pipe coating and cutting boards.

Solid polyurethane
A two component elastomeric material featuring permanent flexibility for the pipeline industry. This product is designed for field joint infill on pipelines with high-density insulation systems. Solid polyurethane gives a high strength, mechanically protective coating with good thermal insulation and excellent flexural strength properties.
**SPECIALTY PRODUCTS**

**Syntactic foam**
A high-density elastomeric thermal coating incorporating small, hollow, glass or polymer spheres. Thermal insulation and external anti-corrosion protection of submerged steel pipelines for fluid transport. With its low thermal conductivity, high mechanical resistance and waterproof condition this coating is ideal to be used in deep waters (up to 400 bars) and can be installed with “reel barge” system. Suitable for operating temperatures between minus 40°C and 140°C.

**Adhesive**
Bonding of structural laminates is one possibility to make strong and durable composites. APU has a range of one component, moisture-curing adhesives. These products are suitable for adhering a wide range of materials such as wood, metal, concrete, PVC, rockwool, polystyrene and polyurethane foam.

**Concrete grouting**
Concrete grouting is designed to be injected under pressure through or into leaking structures to form a water barrier. This product can generally be used with great effectiveness in any instance where conventional chemical grouting is considered. Additionally, it will perform under severe conditions of moving water and/or where great strength is required and other systems are not feasible.
## Commodities

### Polyurethane Raw Material & Chemical

<table>
<thead>
<tr>
<th>Product</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>MDI</td>
<td>Methylene diphenyl diisocyanate</td>
</tr>
<tr>
<td>HDI</td>
<td>Hexa methylene diisocyanate</td>
</tr>
<tr>
<td>TDI</td>
<td>Toluene diisocyanate</td>
</tr>
<tr>
<td>NHT513</td>
<td>Slabstock base polyol (Mwt. 3,000)</td>
</tr>
<tr>
<td>NHT3500</td>
<td>Slabstock base polyol (Mwt. 3,500)</td>
</tr>
<tr>
<td>NHT313</td>
<td>Flexible foam base polyol (Mwt. 5,000)</td>
</tr>
<tr>
<td>NHT4113</td>
<td>Polymer polyol (13% solid contents)</td>
</tr>
<tr>
<td>NHT98</td>
<td>Polymer polyol (40% solid contents)</td>
</tr>
<tr>
<td>Aspol S460</td>
<td>Sucrose base polyol</td>
</tr>
<tr>
<td>Aspol SB490</td>
<td>Sorbitol base polyol</td>
</tr>
<tr>
<td>Aspol G400</td>
<td>Glycerine base polyol</td>
</tr>
<tr>
<td>Aspol T400</td>
<td>Toluene diamine base polyol</td>
</tr>
<tr>
<td>33LV</td>
<td>Amine catalyst</td>
</tr>
<tr>
<td>T9</td>
<td>Tin catalyst</td>
</tr>
<tr>
<td>DC5188</td>
<td>Silicone surfactant</td>
</tr>
<tr>
<td>Pigment</td>
<td>Pigment (various colour)</td>
</tr>
<tr>
<td>CRA9700</td>
<td>Concentrate mould release agent for moulded flexible foam</td>
</tr>
<tr>
<td>DRA9750</td>
<td>Ready to use mould release agent for moulded flexible foam</td>
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<tr>
<td>CRA9401</td>
<td>Concentrate mould release agent for rigid integral skin</td>
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<tr>
<td>DRA9451</td>
<td>Ready to use mould release agent for rigid integral skin</td>
</tr>
<tr>
<td>PO</td>
<td>Propylene oxide</td>
</tr>
<tr>
<td>PG (USP)</td>
<td>Propylene glycol pharmaceutical grade (USP)</td>
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</tbody>
</table>