
# PolymerLink: Your Solution Provider For Rotomoulding Needs

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# MALAYSIA: KEY DEMOGRAPHIC & ECONOMIC INDICATORS

A QUICK SNAPSHOT

## DEMOGRAPHIC PROFILE

### TOTAL POPULATION

EST. 34+ MILLION (2024)

- Citizens: ~90%
- Non-Citizens: ~10%

### ETHNIC DENSITY


### AGE STRUCTURE

- 0-14 (Young): ~22-26%
- 15-64 (Working): ~70%
- 65+ (Elderly): ~7-8%

### RELIGIOUS ADHERENCE

| MUSLIM: | BUDDHIST: | CHRISTIAN: | HINDU: | OTHERS: |
|---|---|---|---|---|
| ~61-63% | ~19-20% | ~9-10% | ~6% | ~2% |

## ECONOMIC PROFILE

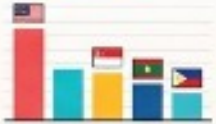
### GDP (GROSS DOMESTIC PRODUCT)

EST. GDP GROWTH (2024): 4-5%

GDP SIZE: ~RM 1.6 - 1.9 TRILLION

### GDP PER CAPITA

EST. NOMINAL GDP PER CAPITA: ~USD 11,800 - 13,000



### LABOR MARKET

- UNEMPLOYMENT RATE: ~2.9 - 3.2% (LOW)
- LABOR FORCE PARTICIPATION: ~70%

### KEY ECONOMIC SECTORS (by GDP)

| SERVICES: | MANUFACTURING: | MINING & QUARRYING: | AGRICULTURE: | CONSTRUCTION: |
|---|---|---|---|---|
| ~55-58% | ~22-24% | ~6-8% | ~6-7% | ~4-5% |

*Figures are estimates based on 2024 data and subject to revision.*

Data from source: Department of Statistics Malaysia (DOSM) & World Bank.

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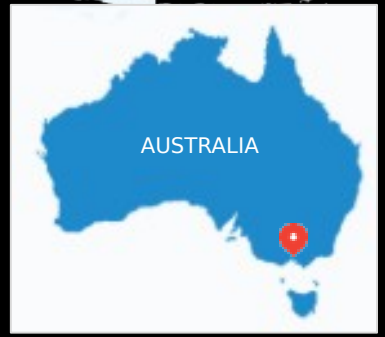



# Leading Experts in Polymer Compounding and Raw Material Supply for Rotational Moulding

Founded in the year 2014, our headquarters is located in Port Klang, Malaysia, as well as local presences in the Philippines, Australia and India with a team of over 60 dedicated professionals.

- **Polymer Link Sdn. Bhd.**
- **Polymer Link India Pvt. Ltd.**
- **Polymer Link Philippines Inc.**
- **Polymer Link Specialities Inc.**
- **Polymer Link Australia Pty Ltd.**

# BEYOND STANDARD SUPPLY

## In-house Masterbatch & Additives

We provide a closed-loop solution by developing functional modifiers within our own facilities.

- **Custom Colors:** Precision matching for industrial branding.
- **UV Stabilization:** UV20+ ratings for extreme outdoor exposure.
- **Performance Additives:** Anti-fungal, conductive, and flame retardant compounds.
- **Grinding:** Exact particle size control for flawless moulding.

# THE "SOLUTION PROVIDER" PHILOSOPHY

## R&D Partnership

Co-developing custom formulations for niche applications rather than selling generic products.

## Troubleshooting

On-the-floor technical support to optimize machine parameters and eliminate scrap rates.

## TCO Optimization

Focusing on Total Cost of Ownership by reducing cycle times and improving yield.

# CASE STUDY: HD6756

# The Challenge: The Processing Paradox

## The LLDPE Standard

Conventionally, linear low-density polyethylene (LLDPE) with a **Melt Flow Index (MFI) of 3–5** is the industry standard for rotational moulding due to its flexibility and impact resistance.

However, in the most demanding applications, standard LLDPE lacks the structural strength to survive harsh environments.

## The Material Gap

Low MFI = High Molecular Weight. This creates a paradox for engineers:

- **Good Mechanicals:** Excellent chain entanglement yields high strength and toughness.
- **Poor Processability:** Low flowability in the molten state makes molding complex geometries highly difficult.

# The Solution: Hyperene HD6756

## Bridging the Gap

**Hyperene HD6756** is a premium High-Density Polyethylene (HDPE) formulated to break the paradox. It delivers a **high MFI** alongside elevated mechanical properties.

- **Superior Processability:** Effortlessly covers complex geometries. And no warpage.
- **Uniformity:** Maintains highly consistent wall thickness.
- **Efficiency:** High flowability potentially reduces cycle times.

## Kayak Engineering Focus

In extreme water sports, HD6756 provides critical structural advantages over LLDPE:

- **High Flexural Modulus:** Withstands higher load capacities without bending.
- **Impact Strength:** Survives heavy collisions and drops onto rocks without cracking.
- **High Tensile Strength:** Prevents hull flexing and eliminates the dangerous **'oil-canning'** phenomenon.

# SOLUTION

**Hyperene™ HD6756 HDPE**

Bridging the technical gap between molecular weight and flowability.

$$\text{MFI} \propto \frac{1}{M_w}$$

- **Rigidity:** 1250 MPa Flexural Modulus.
- **Efficiency:** 7.0 MFI for 15% cycle time reduction.
- **Durability:** Survives -40°C impact without cracking.

# Integrated Masterbatch Excellence

## UV Stabilised

Integration of our UV stabiliser shields kayaks from severe radiation exposure, ensuring they maintain structural integrity and vibrant colours over years of outdoor use.

## Thermal Stabilised

Prevents polymer degradation during high-heat processing. This allows a significantly wider processing temperature range, further easing manufacturability.

## Custom Colour

In-house custom masterbatch brings adventurous aesthetics while serving as a crucial safety feature for high visibility in low light, fog, or rough seas.

**The Final Result :** Hyperene HD6756 bridges the gap between high processability and extreme durability

# CASE STUDY: Rotolining Grade

## Rotolining Series

High mouldability rotomoulding raw for durable quality pipelines.

**Polystik (Natural)**

# The Challenge: Performance vs. Cost

## The Premium Dilemma

High-performance fluoropolymers like **PTFE** and **ETFE** set the industry standard for chemical and thermal resistance in rotolining.

However, for moderate-exposure applications, these materials are heavily **over-engineered and cost-prohibitive**.

## The Market Gap

Industries required a mid-tier solution that bridged the gap between expensive fluoropolymers and standard polyethylene.

- Standard PE cannot bond to metal without costly primers.
- Primer applications add severe labor and material costs.
- Market needed a material balancing **moderate resistance with maximum economic value**.

# The Solution: PolyStik™

## Chemically Modified Innovation

PolyStik™ is an engineered polyethylene tailored specifically for pipe, tank, and vessel rotolining.

- **Direct Adhesion:** Chemically modified matrix establishes direct bonds to metal substrates, eliminating the need for complex primer systems.
- **One-System Economy:** Simplifies processing, heavily reducing multi-step material and labor costs.
- **High Melt Flow Index (MFI):** Ensures superior processability, allowing for smooth, uniform internal coatings.

## One-System

No Primer. No Delamination.

Bridging the gap for smart, economical rotolining.

# Controlled 3-Step Implementation

To ensure consistent quality and maximum adhesion, PolyStik™ utilizes a precise, three-step rotolining thermal process.

1

## Pre-heat Phase

Promotes uniform heat distribution across the metal pipe or vessel.

Prepares the substrate's surface energy for an even, flawless polymer coating.

2

## Melting Phase

Oven temperatures are slightly increased to activate the high MFI matrix.

Facilitates the smooth melting and coating of the internal surface by PolyStik™.

3

## Curing Phase

A final temperature increase enables full cross-matrix chemical bonding.

Allows PolyStik™ to reach its optimal mechanical integrity and permanent adhesion.

# CASE STUDY: XL828

## Crosslink Series

Superior strength and performance through advanced crosslinking technology.

XL828

# THE XLPE ADVANTAGE

## Molecular Superiority

Cross-linked Polyethylene (XLPE) offers an irreversible chemical bond that standard HDPE lacks, providing enhanced thermal and chemical stability.

## Metal Replacement

Designed to replace traditional steel and fiberglass tanks, offering 20% weight reduction and zero corrosion risk over its 20+ year lifespan.

# The Standard XLPE Challenge

## Industry "Pain Points"

- **Pungent Odour:** Peroxide-based chemical reactions generate hazardous gases, impacting operator safety and workplace environment.
- **Coining (Surface Pitting):** Inconsistent flow characteristics lead to "orange peel" textures and surface pockmarking.
- **Dedicated Parameters:** Narrow processing windows force molders to use specific machines and ~20% longer cycle times.

# OVERCOMING THE XLPE CHALLENGE

## Solving "Pain Points"

- **Pungent Odour Elimination:** Advanced chemistry reduces peroxide-based off-gassing, improving facility safety.
- **Anti-Coining Surface Tech:** Eliminates "orange peel" textures and surface pockmarking for flawless finishes.
- **Optimized Processing:** Widens processing windows to reduce cycle times by ~20% compared to standard XLPE.
- **Easy release:  Easy demoulding**

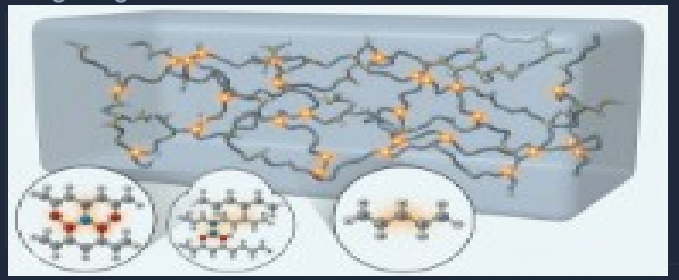
# Re-Engineering the matrix

## Engineering Logic

The goal was to shift from **thermal degradation** to **controlled cross-linking**. By optimizing the additives, we targeted full properties at lower Peak Internal Air Temperatures (PIAT).

## PIAT Optimization

Standard XL grades require over-curing to achieve strength. **XL828** is engineered to develop 100% molecular entanglement at 200 °C, creating a "forgiving" thermal window.



# CORE PERFORMANCE METRICS

## Chemical Inertness

Resistant to a broad spectrum of aggressive chemicals, including diesel, oils, and industrial solvents.

## Thermal Stability

Maintains structural integrity in temperatures exceeding 100°C and sub-zero Arctic conditions.

## Impact Toughness

Superior ESCR (Environmental Stress-Cracking Resistance) compared to standard HDPE.

# XLPE VS. STANDARD POLYMERS

| Property | Standard HDPE | Fiberglass (FRP) | Our XLPE Formula |
|---|---|---|---|
| Chemical Stress Resistance (ESCR) | Moderate | High | **Superior (150%+)** |
| Operational Lifespan | ~10 Years | ~15 Years | **25+ Years** |
| Corrosion Risk | Low | Moderate (Seams) | **Zero (Seamless)** |
| Weight Efficiency | Excellent | Poor | **Industry Leading** |

# CIRCULAR MATERIAL ECOSYSTEM

**Sustainability Without Compromise**

- **EcoFlex™:** 100% Post-Industrial Recycled (PIR) LLDPE for balanced stiffness & impact.
- **Poly Circulo™:** Up to 80% Post-Consumer Recycled (PCR) content, matching virgin grade performance.
- **BioThene™:** Renewable biocomposite blending PE with coconut shell powder.

Helping you meet **European Green Procurement** and CBAM regulatory standards.

# BIOCHAR IN ROTOMOULDING

Sustainable Transformation: Functional Integration, Negative Carbon Credits (ECB/EBC), and Digital Traceability (DPP)

# CARBON-NEGATIVE FRONTIER

### Active Sequestration

Replacing traditional petroleum-based Carbon Black with stable **Bio-Char** derived from biomass pyrolysis.

### Physical Carbon Sink

Every kilogram of Bio-Char locks atmospheric $CO_2$ into the polymer matrix, preventing its return to the air.

### Regulatory Edge

Tangible Scope 3 emission reduction and a hedging strategy against Carbon Border Adjustment Mechanisms (CBAM).

# BIOCHAR INTEGRATION & CARBON CREDITS

- **Functional Performance:** Biochar acts as a high-performance, bio-based filler, replacing fossil-derived Carbon Black in Polyethylene (PE) and Polypropylene (PP) resins.
- **Physical Enhancements:** Improves thermal stability, increases UV resistance, and reduces overall part weight without compromising structural integrity.
- **Negative Carbon Credits:** Verified by the **European Biochar Certificate (EBC)** and **European Carbon Bank (ECB)**.

**C-Sink Potential:** Every tonne of biochar effectively sequesters approximately 2.5 to 3 tonnes of $CO_2$, turning rotomoulded products into active carbon stores.

# DIGITAL PRODUCT PASSPORT (DPP) APPLICATION

## LIFECYCLE TRACEABILITY

Standardized digital record tracking material composition and origin. Ensures "Cradle-to-Grave" transparency for all stakeholders.

## VERIFIED FOOTPRINT

Direct integration with EBC data to provide real-time, audited Carbon Footprint (LCA) metrics and Negative Emission verification.

## CIRCULAR MANAGEMENT

Provides precise instructions for end-of-life recycling and repair, fulfilling EU ESPR mandates for sustainable product design.

*Blockchain-backed Digital Twins ensure the immutability of carbon claims and regulatory compliance.*

# Certifications



# Partnering in Excellence

Smarter Materials. Sustainable Future.

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