**1. Overview of the Redefined LPC System**

The **Redefined LPC System** offers a structured and precise method to classify products based on their inherent logistical attributes. This system is divided into three primary layers:

1. **Product Classification Layer**: Assigns an LPC to each product, encapsulating its inherent logistical attributes.
2. **Shipment Details Layer**: Captures specific shipment information, such as total weight and volume.
3. **Logistics Matching Layer**: Dynamically matches product and shipment details to the most suitable transportation modes and vehicles.

**2. LPC Code Structure**

**2.1. LPC Code Format**

The LPC code is a unique identifier assigned to each product, capturing its key logistical attributes. The structure is as follows:

*[PC]-[TS]-[ES]-[HC]-[PT]-[SHR]-[CPR]-[ARC]-[MUF]-[SA]*

**2.2. LPC Code Segments**

Each segment represents a specific logistical attribute of the product:

1. **Product Category (PC)**
2. **Temperature Sensitivity (TS)**
3. **Environmental Sensitivity (ES)**
4. **Hazard Classification (HC)**
5. **Packaging Type (PT)**
6. **Special Handling Requirements (SHR)**
7. **Compliance/Permit Requirement (CPR)**
8. **Accessibility/Route Constraints (ARC)**
9. **Material Unloading Factor (MUF)**
10. **Stacking Ability (SA)**

**3. Detailed LPC Code Segments**

**3.1. Product Category (PC)**

Identifies the general category of the product being transported.

|  |  |
| --- | --- |
| **Code** | **Description** |
| CON | Concrete |
| STE | Steel Products |
| LUM | Lumber/Wood |
| CER | Ceramics/Tiles |
| GLA | Glass |
| INS | Insulation Materials |
| BRI | Bricks |
| AGG | Aggregates (Sand, Gravel) |
| ELE | Electrical Wires and Cables |
| PLU | Plumbing Supplies |
| PNT | Paints and Coatings |
| FIX | Fixtures and Fittings |
| ADH | Adhesives and Sealants |
| DRY | Drywall and Plaster |
| ROO | Roofing Materials |
| PVC | PVC Pipes and Fittings |
| COM | Composite Materials |

**3.2. Temperature Sensitivity (TS)**

Indicates the product's sensitivity to temperature variations during storage and transport.

|  |  |
| --- | --- |
| **Code** | **Description** |
| T00 | No temperature control needed |
| T01 | Protected from freezing |
| T02 | Heat-sensitive |
| T03 | Requires specific temperature range |
| T04 | Requires both heating and cooling depending on conditions |

**3.3. Environmental Sensitivity (ES)**

Covers the product’s sensitivity to moisture, water, and environmental exposure.

|  |  |
| --- | --- |
| **Code** | **Description** |
| E00 | No special conditions required |
| E01 | Requires dry conditions |
| E02 | Water-resistant |
| E03 | Waterproof |
| E04 | Requires protection from extreme moisture |
| E05 | Water-resistant but sensitive to prolonged exposure |
| E06 | Requires both dry and waterproof conditions |

**3.4. Hazard Classification (HC)**

Addresses whether the material is hazardous and the type of hazard it represents.

|  |  |
| --- | --- |
| **Code** | **Description** |
| H00 | Non-hazardous |
| H01 | Flammable |
| H02 | Corrosive |
| H03 | Toxic |

**3.5. Packaging Type (PT)**

Describes how the product is packaged for transport.

|  |  |
| --- | --- |
| **Code** | **Description** |
| P01 | Palletized |
| P02 | Bulk |
| P03 | Crated |
| P04 | Bagged |
| P05 | Loose |
| P06 | Coiled |
| P07 | Boxed |
| P08 | Modular |
| P09 | Assembled |
| P10 | Bundled/Stacked (e.g., MS rolled sheets) |
| P11 | Straight Bundled (e.g., TMT rebars) |

**3.6. Special Handling Requirements (SHR)**

Reflects specific handling needs.

|  |  |
| --- | --- |
| **Code** | **Description** |
| S00 | None |
| S01 | Fragile |
| S02 | Heavy lifting equipment required |
| S03 | Moisture protection |
| S04 | Requires specific orientation |
| S05 | Requires vibration damping |
| S06 | Requires shock absorption |
| S07 | Multiple special handling requirements |

**3.7. Compliance/Permit Requirement (CPR)**

Reflects any special permits required for transporting the product.

|  |  |
| --- | --- |
| **Code** | **Description** |
| C00 | No special permits required |
| C01 | Permit for oversized load |
| C02 | Hazardous material transport permit |
| C03 | Multiple compliance requirements |
| C04 | Compliance for restricted materials |

**3.8. Accessibility/Route Constraints (ARC)**

Covers constraints related to transportation routes and delivery access.

|  |  |
| --- | --- |
| **Code** | **Description** |
| A00 | No special constraints |
| A01 | Limited access |
| A02 | Requires off-road capability |
| A03 | Mixed roads |
| A04 | Requires crane for unloading |
| A05 | Multi-modal transport |
| A06 | Seasonal access only |

**3.9. Material Unloading Factor (MUF)**

Reflects the requirements for unloading the material at the destination.

|  |  |
| --- | --- |
| **Code** | **Description** |
| U00 | Standard unloading |
| U01 | Crane required |
| U02 | Forklift required |
| U03 | Manual handling |
| U04 | Specialized equipment required |
| U05 | Requires synchronized unloading |
| U06 | Requires phased unloading |

**3.10. Stacking Ability (SA)**

Indicates the stackability of the product during storage and transportation.

|  |  |
| --- | --- |
| **Code** | **Description** |
| S00 | Not stackable |
| S01 | Limited stackability (e.g., maximum 2 layers) |
| S02 | Stackable (standard stacking) |
| S03 | High stackability |
| S04 | Stackable with interlocking |
| S05 | Requires special supports for stacking |

**4. Example LPC Codes with Descriptions**

**4.1. Example 1: TMT Rebars**

**Product Attributes:**

* **Product Category (PC):** STE (Steel Products)
* **Temperature Sensitivity (TS):** T00 (No temperature control needed)
* **Environmental Sensitivity (ES):** E00 (No special conditions required)
* **Hazard Classification (HC):** H00 (Non-hazardous)
* **Packaging Type (PT):** P11 (Straight Bundled)
* **Special Handling Requirements (SHR):** S02 (Heavy lifting equipment required)
* **Compliance/Permit Requirement (CPR):** C01 (Permit for oversized load)
* **Accessibility/Route Constraints (ARC):** A02 (Requires off-road capability)
* **Material Unloading Factor (MUF):** U04 (Specialized equipment required)
* **Stacking Ability (SA):** S03 (High stackability)

**Assembled LPC Code:**

Copy code

STE-T00-E00-H00-P11-S02-C01-A02-U04-S03

**Description:**

* **Product Category:** Steel Products
* **Temperature Sensitivity:** No temperature control needed
* **Environmental Sensitivity:** No special conditions required
* **Hazard Classification:** Non-hazardous
* **Packaging Type:** Straight Bundled (ideal for TMT rebars)
* **Special Handling Requirements:** Heavy lifting equipment required
* **Compliance/Permit Requirement:** Permit for oversized load
* **Accessibility/Route Constraints:** Requires off-road capability
* **Material Unloading Factor:** Specialized equipment required for unloading
* **Stacking Ability:** High stackability

**4.2. Example 2: MS Rolled Sheets**

**Product Attributes:**

* **Product Category (PC):** STE (Steel Products)
* **Temperature Sensitivity (TS):** T00 (No temperature control needed)
* **Environmental Sensitivity (ES):** E02 (Water-resistant)
* **Hazard Classification (HC):** H00 (Non-hazardous)
* **Packaging Type (PT):** P10 (Bundled/Stacked)
* **Special Handling Requirements (SHR):** S02 (Heavy lifting equipment required)
* **Compliance/Permit Requirement (CPR):** C01 (Permit for oversized load)
* **Accessibility/Route Constraints (ARC):** A02 (Requires off-road capability)
* **Material Unloading Factor (MUF):** U04 (Specialized equipment required)
* **Stacking Ability (SA):** S02 (Stackable)

**Assembled LPC Code:**

Copy code

STE-T00-E02-H00-P10-S02-C01-A02-U04-S02

**Description:**

* **Product Category:** Steel Products
* **Temperature Sensitivity:** No temperature control needed
* **Environmental Sensitivity:** Water-resistant
* **Hazard Classification:** Non-hazardous
* **Packaging Type:** Bundled/Stacked (ideal for MS rolled sheets)
* **Special Handling Requirements:** Heavy lifting equipment required
* **Compliance/Permit Requirement:** Permit for oversized load
* **Accessibility/Route Constraints:** Requires off-road capability
* **Material Unloading Factor:** Specialized equipment required for unloading
* **Stacking Ability:** Stackable

**4.3. Example 3: Ceramic Tiles**

**Product Attributes:**

* **Product Category (PC):** CER (Ceramics/Tiles)
* **Temperature Sensitivity (TS):** T00 (No temperature control needed)
* **Environmental Sensitivity (ES):** E01 (Requires dry conditions)
* **Hazard Classification (HC):** H00 (Non-hazardous)
* **Packaging Type (PT):** P01 (Palletized)
* **Special Handling Requirements (SHR):** S01 (Fragile)
* **Compliance/Permit Requirement (CPR):** C00 (No special permits required)
* **Accessibility/Route Constraints (ARC):** A00 (No special constraints)
* **Material Unloading Factor (MUF):** U02 (Forklift required)
* **Stacking Ability (SA):** S02 (Stackable)

**Assembled LPC Code:**

Copy code

CER-T00-E01-H00-P01-S01-C00-A00-U02-S02

**Description:**

* **Product Category:** Ceramics/Tiles
* **Temperature Sensitivity:** No temperature control needed
* **Environmental Sensitivity:** Requires dry conditions
* **Hazard Classification:** Non-hazardous
* **Packaging Type:** Palletized
* **Special Handling Requirements:** Fragile
* **Compliance/Permit Requirement:** No special permits required
* **Accessibility/Route Constraints:** No special constraints
* **Material Unloading Factor:** Forklift required for unloading
* **Stacking Ability:** Stackable

**4.4. Example 4: Adhesives and Sealants**

**Product Attributes:**

* **Product Category (PC):** ADH (Adhesives and Sealants)
* **Temperature Sensitivity (TS):** T01 (Protected from freezing)
* **Environmental Sensitivity (ES):** E00 (No special conditions required)
* **Hazard Classification (HC):** H01 (Flammable)
* **Packaging Type (PT):** P07 (Boxed)
* **Special Handling Requirements (SHR):** S00 (None)
* **Compliance/Permit Requirement (CPR):** C02 (Hazardous material transport permit)
* **Accessibility/Route Constraints (ARC):** A00 (No special constraints)
* **Material Unloading Factor (MUF):** U00 (Standard unloading)
* **Stacking Ability (SA):** S02 (Stackable)

**Assembled LPC Code:**

Copy code

ADH-T01-E00-H01-P07-S00-C02-A00-U00-S02

**Description:**

* **Product Category:** Adhesives and Sealants
* **Temperature Sensitivity:** Protected from freezing
* **Environmental Sensitivity:** No special conditions required
* **Hazard Classification:** Flammable
* **Packaging Type:** Boxed
* **Special Handling Requirements:** None
* **Compliance/Permit Requirement:** Hazardous material transport permit
* **Accessibility/Route Constraints:** No special constraints
* **Material Unloading Factor:** Standard unloading
* **Stacking Ability:** Stackable