**Performance Comparison**

**Siplast Lightweight Insulating Concrete**

- **Hourly Fire Ratings**
  - Siplast lightweight insulating concrete systems provide fire resistant thermal barriers. Numerous hourly ratings are available for separate thermal barriers to the underside of the complete roof insulation system.

- **Slope**
  - Slope is achieved by stair-stepping Insulperm. Specially tapered boards are necessary to achieve slope. This application requires a complex system of numbered, color-coded shapes and sizes to properly match up pieces. No special pieces are required for crickets and saddles.

- **Attachment**
  - Permanent attachment of Insulperm to the substrate is achieved without the use of fasteners. Attachment results from the interaction of Siplast concretes with the substrate. This attachment method achieves FM 1-90 or higher wind uplift resistance.

- **Mechanical Stresses**
  - The encapsulated insulation design provides a stable monolithic surface to accept the roof membrane system. Joints impart mechanical stress to the roof membrane when the insulation board moves.

- **Thermal Stresses**
  - Because of its relatively high density, Siplast Lightweight Insulating Concrete acts as a heat sink, i.e. it is slow to release heat. This "thermal inertia," or mass effect, reduces extreme temperature fluctuations and the resulting thermal stresses which cause membrane fatigue failure.

- **Reroofability**
  - Properly applied Siplast Lightweight Insulating Concrete is highly resistant to damage from moisture, and therefore is reroofable in most circumstances.

- **Stable Insulation Value**
  - Siplast Lightweight Insulating Concrete Systems do not contain any HCFCs to dissipate with time. Therefore, the R-value does not reduce from the time of placement.

- **Environmentally Safe**
  - At the time of reroofing, the insulation system remains in place, thus not contributing to solid waste disposal problems. Siplast Lightweight Insulating Concrete Systems do not contain components harmful to the Ozone layer.

**Ordinary Rigid Board**

- **Hourly Fire Ratings**
  - Most rigid board assemblies have few UL hourly fire ratings. Providing a fire resistant thermal barrier is costly. Numerous hourly ratings are available for separate thermal barriers to the underside of the complete roof insulation system.

- **Slope**
  - Slope is attained by stair-stepping Insulperm. Specially tapered boards are necessary to achieve slope. This application requires a complex system of numbered, color-coded shapes and sizes to properly match up pieces. No special pieces are required for crickets and saddles.

- **Attachment**
  - Permanent attachment of rigid board insulation to the substrate is achieved without the use of fasteners. Boards are not encapsulated and locked to the substrate.

- **Mechanical Stresses**
  - A pattern of continuous joints is inherent in rigid board insulation applications. These joints impart mechanical stress to the roof membrane when the insulation board moves.

- **Thermal Stresses**
  - Because of the very low thermal conductivity of most rigid board insulation, rooftop temperature fluctuations are great, causing thermally induced stress on the roof membrane.

- **Reroofability**
  - Many rigid boards are permanently damaged when exposed to water, requiring costly replacement.

- **Stable Insulation Value**
  - Some rigid board insulations contain HCFCs which can dissipate, reducing R-values over time (thermal drift).

- **Environmentally Safe**
  - At the time of reroofing, rigid board insulation is typically removed and disposed of in solid waste sites.

**Siplast Lightweight Insulating Concrete vs. Ordinary Rigid Board**

Fire resistance, durability, high compressive strength, and excellent resistance to moisture and heat flow are important characteristics of quality roof insulations. In addition to these characteristics, Siplast Lightweight Insulating Concrete Systems offer many advantages that make them superior to ordinary rigid board roof insulation.
A sustainable, high performance roof insulation solution.

Innovation
The lightweight insulating concrete roof insula-
tion solutions offered by Siplast have a long and proud history of over seventy years that began in the 1930s in the northern United States. At that time, building codes requiring the use of lightweight insulating concrete roof decks helped to meet this need. Today there are hundreds of thousands of successful lightweight insulating concrete decks in North America.

Advantages
Siplast Lightweight Insulating Concrete Systems combine the unique properties of Lightweight Insulating Concrete and Siplast Lightweight Insulating Concrete Systems. These independent professionals have met the qualifications of the toughest contractor certification programs in the industry—thus they prove their skill and dedication have demonstrated that they regard themselves as members of a team dedicated to installing great roofing and waterproofing systems. Siplast is committed to placing the same level of responsibility from a single manufacturer. rooftopability of the insulation should the roof membrane remains leak free) and the responsibilities from a single manufacturer.

Siplast Lightweight Insulating Concrete Systems provide high performance roof insulations that combine SB7 modified bitumen membranes with the stability, and thermal performance of light-
weight insulating concrete. This single source of material ensures quality products designed and produced to work together. Siplast Lightweight Insulating Concrete, used together with high performance roof membranes and fasteners, creates a complete system with total responsibility from a single manufacturer.

Products
Siplast Lightweight Insulating Concrete is available in four thicknesses: NBS, Siplast, Insulperm, and Zonocel. The four designs represent a range of compressive and tensile strengths, allowing a choice of system based on substrate and project circumstances. Each design encapsulates Insulation Board Insulation Board in insulating concrete. This provides the protection, prevents an infiltration, and bonds the system to the substrate.

ZIC
The standard ZIC mix is a 1:6 ratio of Portland cement volume to ZIC Concrete Aggregate volume. ZIC is used in new construction applications over densified preformed metal decking. ZIC contains a minimum 2-inch thickness over the top of the Insulperm Insulation Board. An RW variant is 1:6 mix, required for roof concrete aggregate volume. ZIC is engineered for use over non-venting substrates and in re-roofing and re-cover applications. Because of its higher compressive and tensile strengths, ZIC requires only a 1-inch minimum thickness on the top of the Insulperm Insulation Board.

Zonocel
The Zonocel mix is a combination of insulating rigid preformed cellular foam and ZIC Concrete Aggregate. Zonocel is used in new construction applications over densified preformed metal decking. Zonocel contains a minimum 6-inch thickness over the top of the Insulperm Insulation Board.

Insulperm
Insulperm is a premium-quality, CFC-free, expanded polypropylene insulation designed with a nominal 1-inch density specifically designed for use in Siplast Lightweight Insulating Concrete Systems. It provides non-load-bearing substrate for rigid base and reroofing projects. This lightweight preformed metal decking is applied directly to the surface of newly poured Insulperm Insulating Concrete. It is resistant to the thermal gradient, and the special formulation makes it possible to achieve edge patches to zero thickness and skim-coat rough surfaces.

NVS
Siplast Lightweight Insulating Concrete and Siplast Rigid Insulation Board Insulation Board insulations are an ideal choice for roof and ceiling assemblies. Siplast Lightweight Insulating Concrete provides fire protection, durability, high compressive and tensile strengths, and excellent resistance to moisture and heat flow are important factors in the repair of new and existing lightweight insulating concrete. Each base sheet fastener is sized for its terms, Siplast guarantees the roof insulation system and offers a complete roof system package that combines the unique properties of Lightweight Insulating Concrete and Siplast Lightweight Insulating Concrete Systems.

In each base sheet fastener is used for its specific application. The Zone-nil vertical expansion joint is designed for use with ZIC, Insulperm, and Zonocel concrete. The NVS vertical reroofable joint is for use with Siplast Systems. A specially designed reroofing joint allows achievement of FM Approvals 1-60 or higher wind uplift resistance. The NVS base sheet fasteners are engineered to place the special fasteners where required. Zonocel is a unique mixture of cementitious binder, low-density foams, and proprietary additives formulated for use with lightweight insulating concrete surfaces. It is resistant to the thermal gradient, and the special formulation makes it possible to achieve edge patches to zero thickness and skim-coat rough surfaces.

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