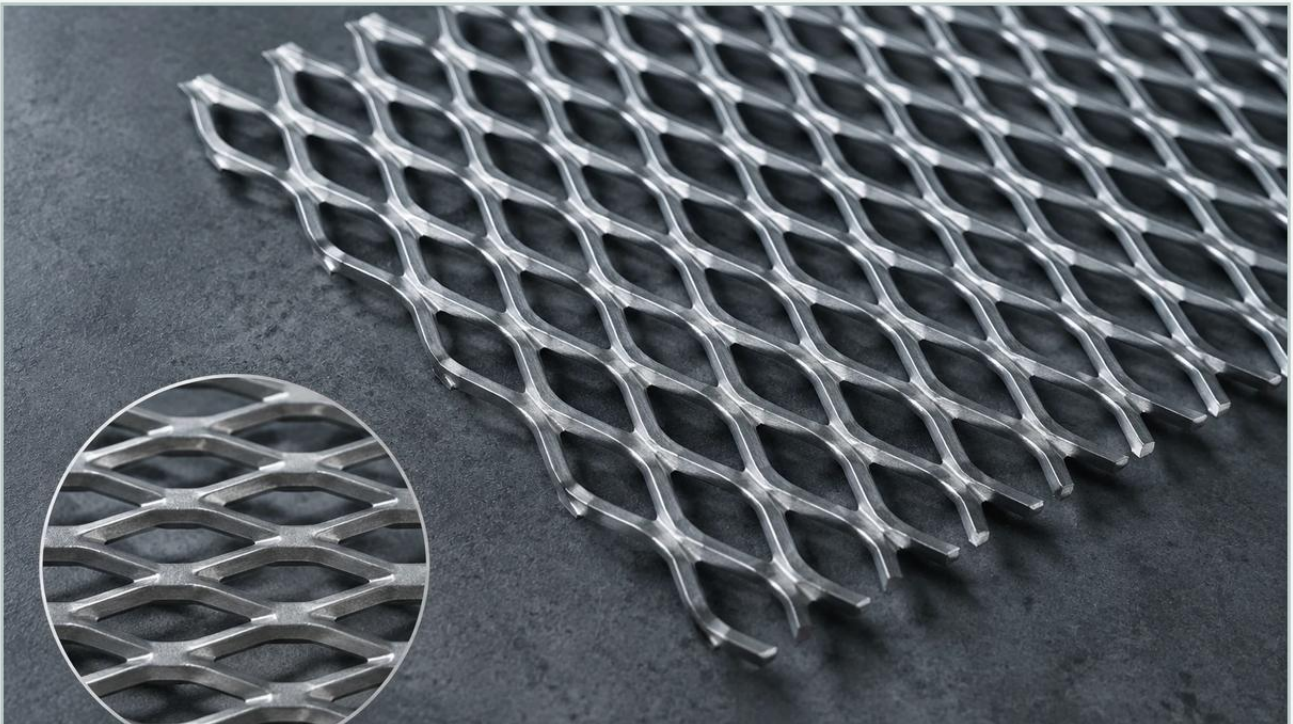


Expanded Metal No 13

A practical guide to expanded metal no 13, covering the reader intent, the relationship to expanded metal no 13, key evaluation criteria, common risks, and the information the intended project audience should confirm before taking the next step.



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Main topic: Perforated & Expanded Metal

<https://www.kaifil.com/products/perforated-expanded-metal/>

In the landscape of industrial materials, expanded metal stands out as a versatile and cost-effective solution for filtration, structural support, and security applications. Among the various specifications available to engineers and procurement specialists, expanded metal no 13 represents a specific category of thickness and weight that balances structural integrity with functional permeability. Understanding the technical nuances of this material is essential for optimizing the performance of industrial filtration systems and mechanical assemblies.

At its core, expanded metal is produced by simultaneously slitting and stretching a solid sheet of metal. This process creates a diamond-shaped pattern of openings, which are integral to the sheet and not joined by welds or fasteners. For high-demand industrial environments, particularly those involving chemical processing or hydraulic systems, the choice of the "No 13" gauge ensures a specific level of durability and resistance to mechanical deformation.

Understanding Technical Specifications of Expanded Metal No 13

The term "No 13" refers to the manufacturer's standard gauge for the base metal thickness before the expansion process. In the context of carbon steel, 13-gauge material is approximately 0.090 inches thick. When this material is expanded, it is typically categorized by the size of the diamond opening, most commonly found in 1/2-inch and 3/4-inch designations.

Dimensional Terminology

To accurately specify expanded metal no 13, engineers must be familiar with the following metrics:

SWD (Short Way of Design): The distance from the center of a bond to the center of the next bond across the short diamond diagonal.

LWD (Long Way of Design): The distance from the center of a bond to the center of the next bond across the long diamond diagonal.

SWO (Short Way of Opening): The actual width of the opening measured from the inside of the bonds.

LWO (Long Way of Opening): The actual length of the opening measured from the inside of the bonds.

Strand Width: The amount of metal fed into the expanding machine between the slits.

Strand Thickness: The thickness of the base metal (in this case, 13 gauge).

For a standard 3/4" #13 expanded metal sheet, the LWD is typically around 2.0 inches, while the SWD is approximately 0.923 inches. These dimensions determine the percentage of open area, which directly impacts flow rates in filtration applications and visibility or ventilation in architectural or safety settings.

| Material Selection for Industrial Environments

While expanded metal no 13 is frequently produced in carbon steel for general industrial use, specialized applications in the chemical, pharmaceutical, and food and beverage sectors often require stainless steel. As a manufacturer specializing in Perforated & Expanded Metal, Kaifil emphasizes the importance of matching material chemistry to the operating environment.

| Stainless Steel vs. Carbon Steel

Carbon Steel: Suitable for dry environments or applications where the metal will be coated (galvanized or powder-coated). It offers high strength-to-weight ratios but is susceptible to oxidation if left untreated.

Stainless Steel (304/316): Essential for filtration components exposed to corrosive fluids, high temperatures, or strict hygiene requirements. 316 stainless steel, in particular, provides superior resistance to chlorides, making it ideal for marine or chemical processing filters.

Aluminum: Used when weight reduction is a primary concern. While 13-gauge aluminum is lighter, it may not offer the same impact resistance as steel in heavy-duty industrial filtration housings.

| Standard vs. Flattened Expanded Metal No 13

One of the most critical decisions for an engineer is whether to specify "Standard" (raised) or "Flattened" expanded metal. The choice significantly affects the mechanical properties and the fluid dynamics of the system.

| Standard (Raised) Expanded Metal

In its standard form, the strands and bonds are set at a uniform angle to the plane of the sheet. This creates a three-dimensional surface that provides excellent grip (if used for walkways) and high structural rigidity. In filtration, the raised profile can help break up laminar flow, potentially increasing the efficiency of pre-filtration stages by creating turbulence. However, the raised edges can also increase pressure drop across the filter element.

| Flattened Expanded Metal

Flattened expanded metal no 13 is produced by passing the standard expanded sheet through a cold-roll reducing mill. This process flattens the strands and bonds into a single plane, resulting in a smooth, level surface. Flattened metal is often preferred when the expanded sheet serves as a support layer for finer wire mesh filters. The smooth surface prevents the finer mesh from being abraded or punctured by the raised edges of a standard expanded sheet during pressure fluctuations or cleaning cycles.

| Applications in Filtration and Industrial Processing

Expanded metal no 13 is a staple in the design of industrial filtration components. Its primary role is often as a structural skeleton or a protective outer guard for more delicate filtration media.

| Support for Filter Cartridges

In high-pressure hydraulic or liquid filtration, the filter media (such as fine stainless steel wire mesh) lacks the structural integrity to withstand high differential pressures. Expanded metal no 13 is rolled into cylinders to act as an internal core or an external cage. Its high open area ensures that it does not significantly impede fluid flow while providing the necessary resistance to collapse or bursting.

| Pre-Filtration and Coarse Screening

In water treatment or intake systems, expanded metal serves as a primary barrier against large debris. The 13-gauge thickness ensures that the screen can withstand the impact of solids without deforming. Because the metal is expanded from a single sheet, there are no welds that can fail under the stress of constant vibration or heavy loads.

| Catalyst Support and Heat Exchange

In chemical reactors, expanded metal sheets can be used to hold catalyst beds in place. The uniform diamond pattern ensures even distribution of gases or liquids through the catalyst. Additionally, the increased surface area of raised expanded metal can assist in heat dissipation in certain industrial cooling applications.

| Key Evaluation Criteria for Engineers

When selecting expanded metal no 13 for a project, engineers should evaluate the following factors to ensure long-term reliability and cost-effectiveness:

1. **Percentage of Open Area:** This is the ratio of the area of the openings to the total area of the sheet. For filtration, a higher open area reduces pressure drop but may decrease the structural strength of the component. Engineers must find the "sweet spot" that satisfies both flow requirements and mechanical loads.

2. **Load-Bearing Capacity:** Unlike perforated metal, expanded metal has a directional strength. The sheet is significantly stronger across the SWD than the LWD. Proper orientation during installation is critical for components subjected to mechanical stress.

3. **Tolerances and Flatness:** For OEM applications where the expanded metal must fit into a precision-machined housing, specifying tight tolerances on the sheet thickness and diamond dimensions is necessary. Flattened metal generally offers more predictable thickness tolerances.

4. **Edge Conditions:** Expanded metal naturally has "random" edges where the diamonds are cut. For safety or assembly purposes, engineers may require "bond edges" (where the cut happens at the junction of the diamonds) or specialized framing to eliminate sharp points.

| Customization and OEM Solutions

Standard off-the-shelf expanded metal may not always meet the specific needs of complex industrial systems. Customization is often required to optimize the performance of filtration components. As a professional manufacturer, Kaifil provides tailored solutions that go beyond standard catalog dimensions.

Customization options include:

Specific Alloy Selection: Utilizing exotic metals or specific grades of stainless steel to meet chemical compatibility requirements.

Custom Diamond Sizes: Adjusting the slit length and expansion width to achieve a precise open area percentage or to trap specific particle sizes.

Secondary Processing: This includes shearing to exact sizes, rolling into cylinders, welding, and surface finishing (such as passivating stainless steel to improve corrosion resistance).

By working closely with a manufacturer during the design phase, engineering teams can reduce the total cost of ownership. For example, selecting a more durable 13-gauge stainless steel expanded metal for a filter cage might involve a higher initial cost than carbon steel, but it significantly extends the replacement cycle and reduces maintenance downtime in corrosive environments.

| Procurement and Quality Assurance

Before finalizing a purchase order for expanded metal no 13, the following information should be confirmed with the supplier to ensure the material meets the application's demands:

Exact Material Grade: Confirm the specific alloy (e.g., SS304 vs. SS316L).

Style Designation: Clearly state if the requirement is for "Standard" or "Flattened."

Direction of Diamonds: Specify if the LWD should run parallel or perpendicular to the length of the sheet.

Surface Finish: Determine if the material requires degreasing, pickling, or electropolishing, especially for pharmaceutical or food-grade applications.

Quality assurance is paramount. Reliable manufacturers provide material test reports (MTRs) to verify the chemical composition and mechanical properties of the steel. This documentation is often a requirement for compliance in regulated industries such as aerospace, medical, and oil and gas.

| Conclusion

Expanded metal no 13 remains a fundamental component in industrial engineering due to its unique combination of strength, permeability, and resource efficiency. Whether it is used as a robust support core in a high-pressure filter cartridge or as a protective screen in a chemical processing plant, its performance is dictated by the precision of its specifications. By understanding the dimensional characteristics, material options, and manufacturing variations like flattening, engineers can select the optimal expanded metal solution to meet their specific technical challenges. For those seeking specialized guidance or custom-fabricated components, partnering with an experienced manufacturer like Kaifil ensures that the filtration and structural needs of the project are met with technical expertise and high-quality manufacturing standards.