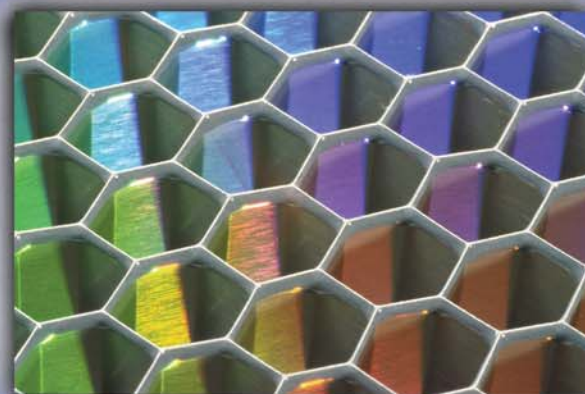
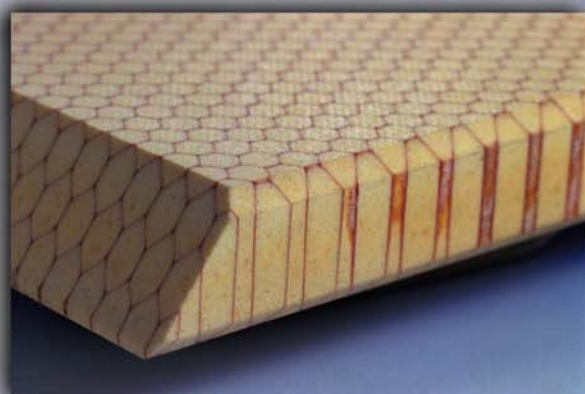


Hysol®

Core Splices



Core Splices

Description – Core splices are a class of foaming film adhesives that expand during heat cure up to 2-3 times their original size. Core splice adhesives are typically epoxy-based and use a combination of either a blowing agent that releases a gas during heat cure or an expanding filler.

Purpose of Core Splices/Foaming Adhesives – The purpose of a core splice is to evenly transfer load from one section of core to another section of core and to fill the gap up to the skin surface. This assures a good load transfer and also serves as a method of preventing moisture ingress in honeycomb-stiffened parts through the core splice joint.

Open vs. Closed Cell Expansion:

- ◆ Closed-cell means that there are no continuous pockets of porosity resulting from the expansion process. Closed cell foaming adhesives typically show better resistance to moisture ingress or water penetration than open cell foaming adhesives. Closed cell core splices have a slight advantage on consistency of expansion and in some cases higher compressive strengths.
- ◆ Open-cell foams (see cover photo) have the appearance of a sponge with numerous areas of porosity. Both open cell and closed cell core splices provide good mechanical tube shear values.

Key Features:

- ◆ **Uniform Expansion** - The ideal characteristics for a core splice adhesive is uniform expansion. Expansion is controlled by the type of expanding agent used, the percentage, its potency as well as its expansion temperature. Wide variations in heat of a part can lead to inconsistent expansion.
- ◆ **Pliability** - The softer the core splice, the easier it to insert into core gaps improving worker productivity.
- ◆ **Mechanical Strength** - Mechanical strength of a core splice is typically measured by tube shear strength. Tube shear strength is determined by the strength of the resin under its expanded condition, the uniformity of the expansion and the amount of material or density of the tube shear specimen. Henkel has one of the broadest selections of core splice and expanding adhesives to meet the needs of the aerospace industry.
- ◆ **Sag Resistance** – Sag resistance is important is a core splice because the material must expand fully in a relatively open space and then cure in place. Excessive amounts of sag would adversely affect the ability of the core splice to maintain a good gap fill.

Product	Chemistry	Resistant to Moisture Penetration	Key Features	Product Configuration	Cure	Comments
Latest Generation Core Splices						
PL 685	Expanding Epoxy Film	Yes	Latest generation core splice	50 mil or 100 mil	250°F or 350°F	Higher expansion than MA 562, more pliable so easier to insert into core.
PL 7002	Expanding Epoxy Film	Yes	Black version of PL 685	50 mil or 100 mil	250°F or 350°F	Black version of PL 685, improved pliability for core embedding and easier shop floor cutting.
2nd Generation Core Splices						
MA 562	Expanding Epoxy Film	Yes	Industry standard, most widely qualified, second generation core splice	50 mil or 100 mil	250°F or 350°F	Industry standard. Value solution. Offered in most slit widths and configurations. New applications should migrate to PL 685 or PL 7002.
MA 562S	Expanding Epoxy Film	Yes	Slightly higher expansion	50 mil or 100 mil	250°F or 350°F	The "S" version has slightly higher expansion potential than MA 562.
MA 562SFR	Fire Retardant Epoxy Film	Yes	Features 60 second vertical burn and slightly higher expansion than MA 562	50 mil or 100 mil	250°F or 350°F	Capable of meeting 60-second vertical burn and has slightly higher expansion than MA 562.
1st Generation Core Splice						
MA 557	Foaming Epoxy Film	No	First generation open cell foaming core splice	50 mil or 100 mil	250°F or 350°F	Black in color, new users should migrate to PL 7002.
High Temperature Core Splices						
Hysol EA 9833.1	Foaming BMI film	No	High temp performance	50 mil or 100 mil	350°F/415°F postcure	Used for high temperature core splicing engine nacelles.
Expanding Pastes						
PL 460	Expanding Epoxy Paste	Yes	Non structural expanding paste	50 mil or 100 mil	250°F or 350°F	For edge close-out applications, BMS 5-90 Type 4.
Hysol EA 9815	Expanding Epoxy Paste	Yes	250°F service structural paste adhesive.	50 mil or 100 mil	250°F or 350°F	Expanding adhesive qualified to BMS 5-90 and meets requirements of BMS 5-101.
Structural Core Splices and Core Fill Materials						
SynSpand 9899CF	Expanding Syntactic Epoxy Film	Yes	Structural compressive strength	50 mil or 100 mil	250°F or 350°F	Used for core fill and edge fill applications. Possesses high degree of compressive strength. Good resistance to sonic fatigue, which makes it more adaptable to nacelle usage.

