

Designing the Future

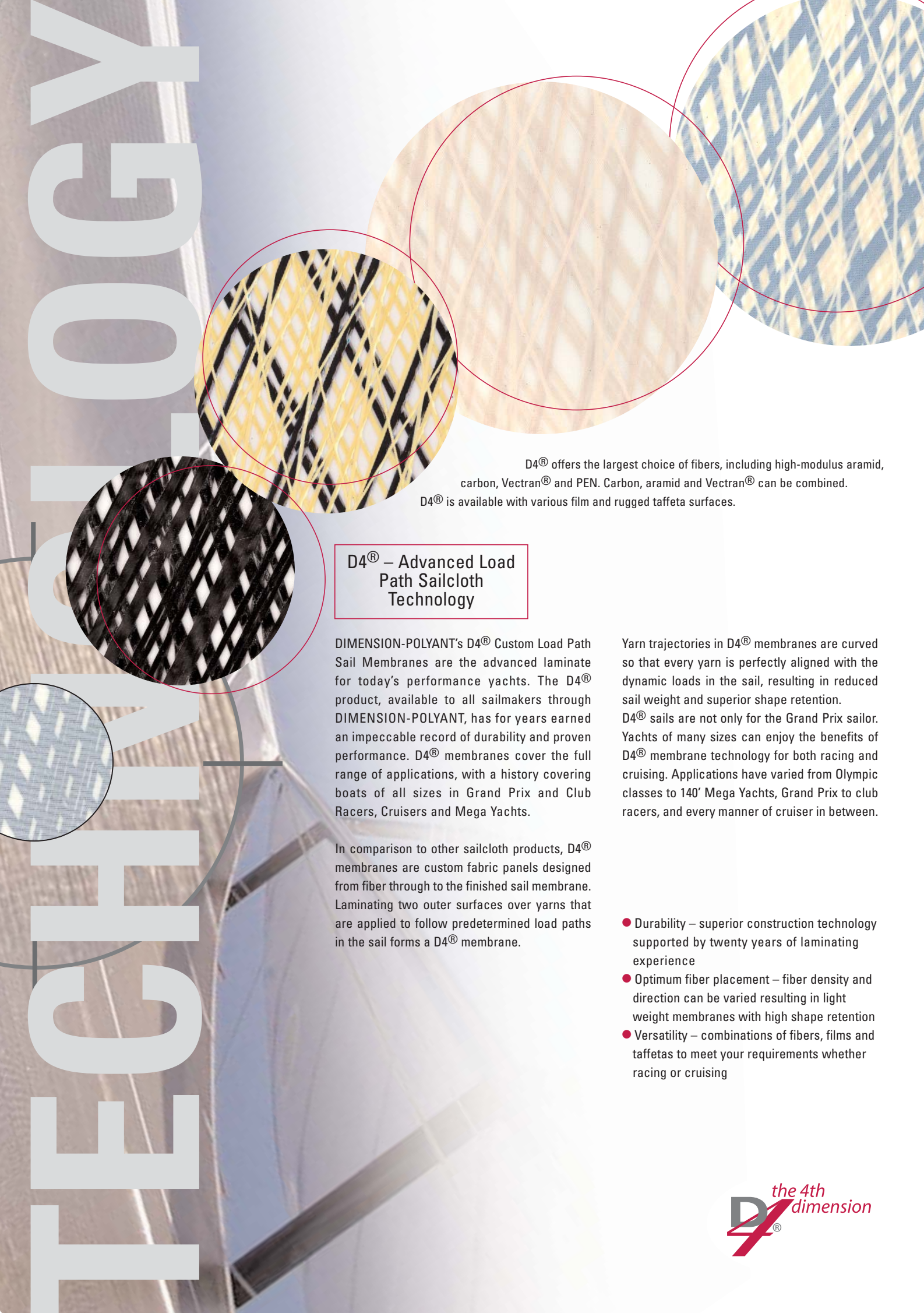
*clear ahead*



*D4<sup>®</sup> Custom Load Path Sail Laminates*



X-PLY<sup>®</sup> · DC-Line<sup>®</sup> · HydraNet<sup>®</sup> · FLEX<sup>®</sup> · Wovens · D4<sup>®</sup> Membranes · HydraNet<sup>®</sup> radial · GraphX<sup>®</sup> Carbon · DYS<sup>®</sup> Offshore · X-Tech · HTP<sup>®</sup> plus · INSERT<sup>®</sup>



D4® offers the largest choice of fibers, including high-modulus aramid, carbon, Vectran® and PEN. Carbon, aramid and Vectran® can be combined. D4® is available with various film and rugged taffeta surfaces.

### D4® – Advanced Load Path Sailcloth Technology

DIMENSION-POLYANT's D4® Custom Load Path Sail Membranes are the advanced laminate for today's performance yachts. The D4® product, available to all sailmakers through DIMENSION-POLYANT, has for years earned an impeccable record of durability and proven performance. D4® membranes cover the full range of applications, with a history covering boats of all sizes in Grand Prix and Club Racers, Cruisers and Mega Yachts.

In comparison to other sailcloth products, D4® membranes are custom fabric panels designed from fiber through to the finished sail membrane. Laminating two outer surfaces over yarns that are applied to follow predetermined load paths in the sail forms a D4® membrane.

Yarn trajectories in D4® membranes are curved so that every yarn is perfectly aligned with the dynamic loads in the sail, resulting in reduced sail weight and superior shape retention.

D4® sails are not only for the Grand Prix sailor. Yachts of many sizes can enjoy the benefits of D4® membrane technology for both racing and cruising. Applications have varied from Olympic classes to 140' Mega Yachts, Grand Prix to club racers, and every manner of cruiser in between.

- Durability – superior construction technology supported by twenty years of laminating experience
- Optimum fiber placement – fiber density and direction can be varied resulting in light weight membranes with high shape retention
- Versatility – combinations of fibers, films and taffetas to meet your requirements whether racing or cruising



Photo: Gilles Martin-Raget



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## D4® - Superior Results From Superior Technology

Since its inception, D4® has delivered on the promise to provide high performance. Racing results aside, D4® is characterized by an unsurpassed level of durability and shape holding. This standard is due to years of development in fiber layout, lamination and components.

D4® membrane sails are assembled from a minimum number of sections required to exactly replicate the designer's three-dimensional mould. Owing to high-strength bonding systems utilized there is no need for continuous fibres. Instead, an optimum lamination result is achieved by working with flat panels and allowing for maximum pressure applied forming the laminate.

The use of vacuum pressure for the process is another attribute of DIMENSION-POLYANT's dedication to unsurpassed quality. Today's D4® process is a fully integrated design and

manufacturing technology. Each D4® membrane is an individually constructed and well balanced structure, addressing both primary and transverse loading plus load changes whilst racing in order to maintain the designed shape. DIMENSION-POLYANT's long-standing experience in sailcloth design, fiber handling and laminating adds tremendous know-how and patented methods to the successful D4® system, resulting in the most versatile and reliable membrane system in the world. First places in many Grand Prix races both around-the-buoys and offshore give proof of D4®'s superior performance!

- Ultra light weight laminate through combination of high-pressure and vacuum
- Patented X-PLY® and Interply™ yarn arrays absorb off-axis loads
- Modern seam joining technology used for D4® ensures the stretch resistance of continuous yarns

*High-molecular weight resin systems offer the best properties for sailcloth applications, resulting in unsurpassed bond strength and longevity. DIMENSION-POLYANT knows that there is no better recipe for membranes for large, ocean-going yachts.*

D4® resin system

thermoplastic resin system

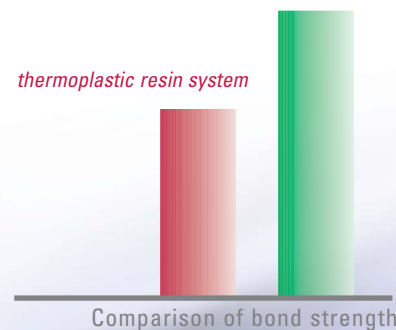


Photo: Tim Wright



Southern Wind Shipyard © Ocean Images / Doyle Palma

## D4® – Cruising Performance Through Load Path Technology

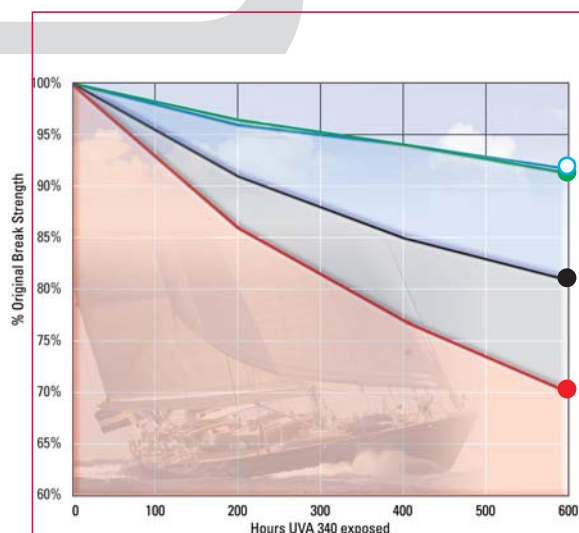
The modern cruising sail represents special challenges for sail designers and sailmakers. Rapidly developing boat design and sail handling systems require sails to be lighter than ever with shape retention that only Grand Prix racing sails have been able to offer, while longevity is the continuing priority. D4® membranes incorporate all three needs in the same sail.

D4®'s load path technology of multi-load-point yarn layouts, combined with DIMENSION-POLYANT's extensive fiber processing experience, result in extremely light yet rugged membranes. D4® features yarn trajectories that not only address

loads radiating from the corners but also those concentrating at reef points and furling reef points. Ensuring the proper thread orientation for the load paths decreases overall off line degradation, adding to the life of the sail.

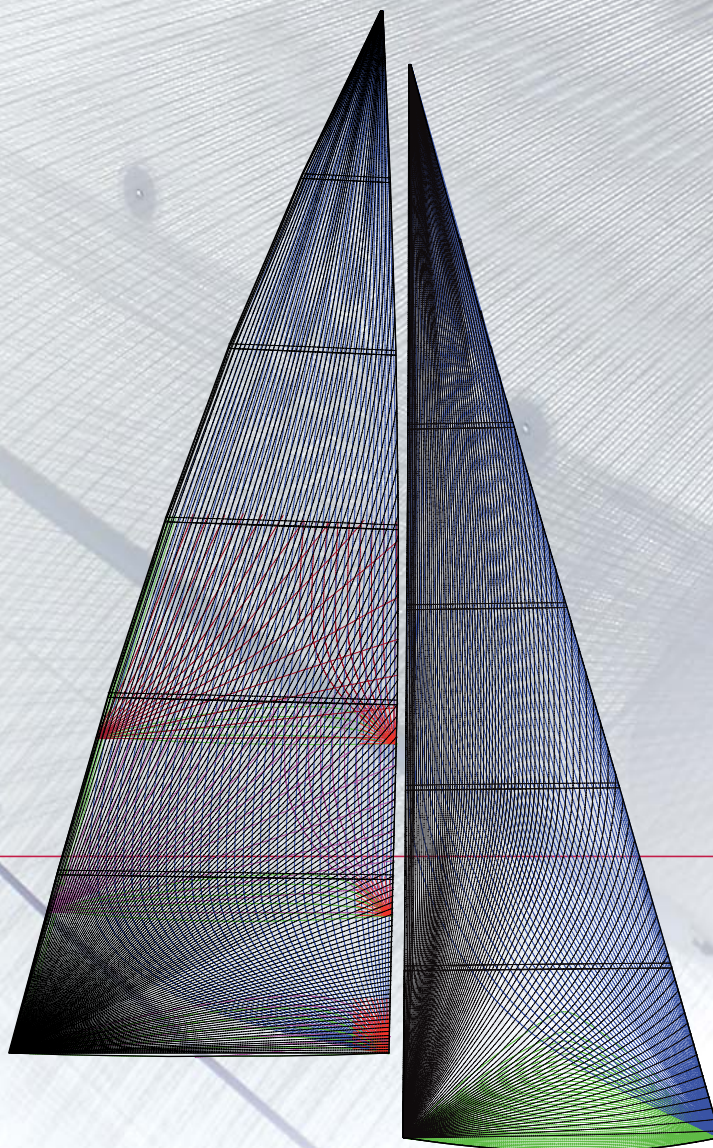
A large choice of surfaces and fibers, including Vectran® and carbon blends, allows the sailmaker to build membrane sails for the intended use, for both performance and offshore cruisers. Rugged taffetas feature anti-microbial coatings to address mildew while a UV resistant TiO<sub>2</sub> coating on the taffetas, fibers and adhesives protect both internal and external fibers.

- Largest choice of fibers and rugged taffeta surfaces
- Extra yarn arrays radiating from reef points absorb and disperse loads of reefed sail of both standard and furling sails
- Anti-microbial and anti-UV TiO<sub>2</sub> treated components



Every resin used in the D4® process contains UV inhibitors and anti-microbial additives thus maximising the life of your D4® membrane sail. Woven surfaces ('taffetas') are treated with top coatings containing both titanium dioxide and anti-microbial for unequalled protection from UV and mildew.

| Description/Hrs exposed      | 0    | 200 | 400 | 600 |
|------------------------------|------|-----|-----|-----|
| ○ DIMENSION-POLYANT Taffetas | 100% | 96% | 94% | 92% |
| ● DIMENSION-POLYANT UV films | 100% | 97% | 94% | 91% |
| ● Generic Taffeta            | 100% | 91% | 85% | 81% |
| ● Generic Film               | 100% | 86% | 77% | 70% |



## D4® – Versatility, Proven Performance and Durability

Accurate yarn placement within the D4® sail, based upon realistic analysis of the magnitude and direction of the loads, offers exceptional performance. Fibre count and yarn arrays are precisely placed throughout the membrane to form the optimum sail structure. DIMENSION-POLYAN's lamination techniques result in a lasting membrane fabric, ensuring the quality that is expected from the world's leading sailcloth manufacturer.

Sailmakers and designers can select from a wide range of surfaces and fibres. High tenacity yarns can be applied as a single fibre type or in blended ratios with other fibres. The complex fibre matrix is combined with various film or

taffeta surfaces, depending upon the intended use. With the flexibility of higher or lower yarn counts and differing outer layers, the sailmaker ensures the correct performance characteristics of the membrane for whatever application the customer needs.

Every segment of a D4® membrane is designed to handle not only the principle loads under normal sailing conditions, but also those that are generated when a sail is reefed. Yarn trajectories can radiate not only from the corners of a sail but also from Cunningham and reef locations, accepting and dispersing the loads generated when the sail is trimmed, reefed or furled. D4® membranes for standard and furling mainsails and headsails can be designed to incorporate extra yarn arrays, allowing smooth furling of sails due to minimum thickness.

- Consistent shape retention through accurate yarn placement
- Superior longevity through superior manufacturing methods
- Improved shape retention – intelligent yarn matrix absorbs load changes



Continuous product development of DIMENSION-POLYANT's entire product range ensures the perfect sailcloth is available for the regatta and cruising enthusiast.

D4<sup>®</sup> Custom Load Path Membranes is DIMENSION-POLYANT's latest product line addition and allows sailors around the world to choose the right sail for the right application – from woven polyesters through traditional laminates to D4<sup>®</sup> Custom Load Path Membranes.

DIMENSION-POLYANT always guarantees the highest level of quality for all of its products, owing to vertically integrated and complete in-house production at facilities located in Germany, the United States and in Australia.



sailcloth  
technology

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MARIA CATTIVA/B. KING 39M ©Ocean Images

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Please contact your sailmaker for further information.