

The Details Behind Building High Quality Yachts

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What does it take to build some of the highest quality production yachts in the world? Having worked on and crawled through the bowels of hundreds upon hundreds of boats, production and custom, power and sail, recreational, commercial and military, I have developed strong opinions regarding that question, and its answer.

Among other things it takes skilled craftsmen and women, an able engineering and administrative staff and a willingness to constantly critique your own product, embrace constructive criticism from others, and of course carry out continuous improvement.

I believe there's one more facet that's required; it's one that's often overlooked or minimized by many boat builders and frequently unappreciated by boat buyers; it involves compliance with established, recognized boat building standards established and/or administered by independent, third party organizations.

For Vessels Sold in the United States and Canada

When I discuss the subject of boat building with clients, particularly when analyzing the specifications for a new build, or when reviewing an existing vessel's systems, the dearth of government-mandated requirements often comes as a surprise. For better or worse, the United States marine industry operates in a somewhat *laissez-faire* environment. This is especially so

for diesel-powered, recreational vessels (gasoline-powered vessels are subject to more and stricter standards).

While a handful of requirements are mandated for these vessels via the United States Code of Federal Regulations, navigation lights, fire extinguishers, distress signals and items of that sort, most boat builders are essentially on their own when it comes to designing and building a seaworthy, reliable and safe product. While it's in their best interest to do so, many don't and are not compelled, other than by competitive market pressure, to do otherwise. Reputable builders, however, recognize the value in complying with accepted standards, even if they are voluntary.

Fortunately, there are such standards, which are established by a standards-setting body, one that many boat buyers and owners have heard of, even if they aren't entirely certain of the role it plays; "The American Boat and Yacht Council", often referred to by its acronym ABYC. Warning, from this point forward the discussion regarding standards and compliance is fraught with an alphabet soup of acronyms; I'll make every effort to keep it understandable.

The organization was formed during the recreational boating industry's exponential growth of the 1950's. Fiberglass was a revolutionary product in this day; most boats were still built using timber, caulk and enamel paint. In 1950, members of the 'Motorboat and Yacht Advisory Panel' of the 'US Coast Guard's Merchant Marine Council' were tasked with creating an organization that would provide boat builders, equipment manufacturers and repair yards with critical safety

related information. With this mandate, the American Boat and Yacht Council was born, convening its first meeting at New York City's Lexington Hotel in April of 1954.

The ABYC has come a long way since then. The initial standards were a scant few pages. Now, its phone book-like tome, officially referred to as the "Standards and Technical Information Reports for Small Craft" or STIR, is comprised of over sixty chapters detailing design and installation requirements that include everything from battery chargers and inverters, to seat structures and exterior windows, windshields and hatches. Still, for diesel-powered recreational vessels it remains largely voluntary, in the United States the Coast Guard or marine police won't cite you, or a boat builder, because your vessel fails to comply with one of the ABYC's many standards. Vessels may be ABYC compliant, however, contrary to popular belief, there is no such thing as an ABYC "certified" vessel per se, although there are programs wherein a vessel may be certified using ABYC Standards.

Enter the NMMA or National Marine Manufacturers' Association. A marine industry organization comprised of marine equipment manufacturers and boat builders, the NMMA and ABYC have teamed up to create the 'NMMA-Certified Vessel Program'. Once again, it remains voluntary, however, it affords builders the opportunity to let would be buyers know that their products are built to a recognized standard. Vessels that comply with the requirements of the program may display a "NMMA Certified Using ABYC Standards" decal or plaque. I routinely point out

the value of this collaborative program to boat buyers, in that it essentially means the boat builder is placing his or her reputation on the line, declaring that the vessel is designed and built to meet the most important ABYC standards.

Manufacturers that participate in the program must be members of both the ABYC and NMMA, the former affords them access to the standards, as well as certification for their staff, while the latter enables them to submit their product for approval. Once a builder is confident that his or her boat is ABYC compliant, it is then submitted for review by a NMMA inspector. Upon successful completion of the inspection, the builder may then display the certification decal or plaque.

Provided the builder agrees to build the same model, with no substantive changes, the certification may be extended forward to each successive hull number, in what's known as a 'type certification'. The honor system plays a big part in the success of this program; with a builder's reputation riding on how often vessels are submitted for inspection, a process for which the builder must pay.

Fleming Yachts participates in the NMMA-Certified Vessel Program, and has done so since early 2009, and all Fleming models sold in the United States proudly display the 'NMMA Certified Using ABYC Standards' plaque.

The Canadians have upped the compliance stakes for boat builders offering their products in this region. Recreational vessels sold in Canada must, as of April 2010 meet 'TP 1332 E – Small Vessel Regulations', as well as complying with a host of documentation and paper-work

requirements, including a Declaration of Conformity and Application for Compliance.

Established and administered by 'Transport Canada' (the Canadian equivalent of the US Department of Transportation, the umbrella under which the US Coast Guard once fell, until it was absorbed by the Department of Homeland Security), TP 1332 E "Construction Standards for Small Vessels" is an amalgam of ABYC and ISO (International Standards Organization) guidelines, the latter being used by European boat builders, more on them in a moment. ABYC Standards are referenced throughout TP 1332 E, and thus, with the exception for the mandate for

compliance, there are many similarities with the approach used for boats sold in the United States. Among other differences, there is a requirement for English and French labeling contained within the Canadian standard.

All Fleming models sold in Canada comply fully with TP 1332 E. Fleming Yachts are believed to be the first production yacht builder to fully comply with Transport Canada's Declaration of Conformity and Application for Compliance.

The Europeans

Requirements for selling recreational vessels in the European Union (EU) are just that, requirements, they are mandatory and strictly enforced, it being virtually impossible to import a non-compliant vessel into the EU for sale, and no vessel may be sold in the European Union unless it carries the Conformité Européenne or CE symbol, which in turn means it complies with a raft of regulations that encompass the vessel, its design, construction scantlings and virtually every piece of gear aboard.

Standards for the vessels built to comply with EU requirements, or for those being sold in the European market, must comply with guidelines contained in the Recreational Craft Directive (RCD), which includes what the EU refers to as EN-ISO harmonized standards. The RCD is similar to ABYC's Standards and Technical Information Reports. In fact, a great deal of effort has been, and continues to be, put forth in an effort to harmonize the RCD-CE standards, in an effort to make life somewhat easier for boat builders like Fleming Yachts, who sell products into multiple markets.



Depending upon the region for which a Fleming is built, it may be required to display builder's plates like those shown here, certifying in this case that the vessel meets both Australian and CE construction standards.



While most seacocks look alike, few meet the demanding requirements established by the American Boat and Yacht Council. Yet, in order for a vessel to display the ABYC/NMMA approval placard, only seacocks meeting these standards may be used.

The primary difference between RCD-EU and the NMMA-ABYC programs is the mandate and enforcement established by the former, vessels sold in the EU must comply, period. There's more, not only must they comply, they must be inspected and certified, typically by an approved third party contractor, often referred to as a 'notified body'. Fleming Yachts utilize a specialist contractor who provides this service on a regular basis, for each and every Fleming built to CE standards.

Similar to the ABYC-NMMA program, the notified body inspector inspects and provides a type certification for a production vessel, one whose design and systems remain essentially unchanged from hull to hull. Typically, inspections for the first vessel of a new model, or one that's been substantially changed, occur at the factory, enabling the inspector to verify structural details and fiberglass lamination schedules, as well as the factory's overall operation during the build.

At this time yet another requirement of the CE certification process comes into play, documentation, and lots of it, creating what's known as the Master Technical File (I've resisted the temptation to refer to this as a MTF). When complete, the file represents virtually every important aspect of the build process including electrical system, structural, bilge pump, fire and carbon monoxide alarms, fire suppression systems, engine installation, fuel delivery and storage, man overboard prevention and recovery, encompassing virtually every RCD-ISO standard. Each new vessel of a specific model has information regarding any changes in design, construction or equipment added to the Technical File, fully documenting these modifications, with major changes requiring a re-certification rather than simply updating of the file. For example, when the Fleming

75 was fit with a bustle, morphing into the Fleming 78, a full structural analysis and stability inclination trial had to be carried out in order for it to retain its CE certification. The Master Technical File also forms the basis for the EU Declaration of Conformity or DoC, which in turn is signed by the boat builder, with authorization of the notified body, for each and every completed CE compliant vessel.

The CE certification process doesn't end here. When the vessel is launched, a representative from the notified body will carry out yet another inspection, which includes yet another review of the vessel's Technical File, ensuring its accuracy and completeness, as well as confirming key afloat factors such as the full stability inclination trials and subsequent calculations for the CE Ocean Rating, which includes A-Ocean, B-Offshore, C-Inshore and D-Sheltered Waters (the descriptive terms, ocean, offshore etc, are being phased out by the ISO in the belief that they may be misleading, the letter categories and their requirements will remain). In spite of the fact that it's not required for non-CE certified vessels, all Fleming Yachts built since 1999 structurally meet CAT A, however, small CE specific requirements, deadlights or covers on port lights for instance, are not fitted to non-CE vessels unless requested.

Australia and New Zealand CE with an Oz Twist

Standards governing vessels sold in these countries are very similar to RCD-CE requirements, with similar regulations regarding mandatory compliance and documentation. There are a small number of unique requirements regarding electrical systems function and safety labeling, and the Australian Builder Plate, this is similar to the plate required for CE compliant vessels, which includes information regarding the safe loading

and capacity of the vessel.

International Standards Organization for Manufacturers

Keeping track of the myriad standards for each region can be a daunting task. Not only are their idiosyncrasies and differences among each set of standards, they evolve and are modified on a regular basis. At one time this would have required keeping and updating sets of bound, paper manuals. Today, a Dutch company aptly named 'Rule Finder' provides boat builders like Fleming Yachts with online access to each of the standards, and it's continuously and automatically updated and cross referenced.

Fleming Yachts also uses build software to keep track of a vessel's compliance requirements. Before the first gallon of fiberglass resin is ever mixed, or length of teak milled, the vessel's order identifies the destination to which it will be shipped. Once that's established, a vessel headed for a customer in Sydney for instance, the compliance program then determines what's needed to meet EU and AUS/NZ requirements, ensuring the vessel is fully compliant with the latest standards.

Beyond compliance with voluntary guidelines, and adherence to mandatory regulations, Fleming Yachts also adheres to international standards for the manner in which their business and ship yard are operated. Fleming



The NMMA vessel compliance program is voluntary, builders who choose to meet its standards send a clear message to their customers; quality, reliability and safety are of the highest importance.

Yachts, and the yard where their vessels are built, meet stringent ISO standards, each of which includes a thorough annual audit and inspection.

These include ISO 9001, which specifies how a company's management, employment and documentation systems operate. There's a reason major manufacturers and service providers like Bentley, Disney and Sony have chosen to adopt this exacting international standard. Ultimately, compliance with this standard ensures that an organization has the right systems in place to ensure efficiency, disciplined manufacturing techniques, consistency and a streamlined working environment.

The standard also establishes the roles played by each key individual in the company's management and production structure, thereby making it clear to the entire work force who is responsible for each step required to build a new Fleming, from completing initial material orders and paperwork, to carrying out final quality assurance checks. Ultimately, while obtaining and maintaining ISO 9001 certification is no small feat, the benefits are clear; Fleming Yachts operates more efficiently, while producing a consistently higher quality vessel.

Yet another ISO standard which Fleming has chosen to meet is 14001, it establishes criteria for environmental stewardship. Compliance with ISO 14001 means the vessels are built using less energy, while producing less waste. The standard emphasizes proactive management and employee involvement related to an organization's environmental policies, which in turn lead to greater production accuracy and less re-work, and hence lower energy and material consumption.

Building the Highest Quality Vessels

While membership in, and compliance with the various standards of the aforementioned organizations, ABYC, NMMA, CE, ISO and others, make it possible to build the highest quality vessels, it is by no means a guarantee.

Compliance is but one arrow in Fleming's quiver, as they strive to build each vessel to meet the highest possible criteria of each of the aforementioned guidelines, regions and requirements. This means every Fleming built benefits as a result of these requirements, not just those destined for markets where regulations are more stringent. Doing so requires constant vigilance, from the sales and engineering staff to the craftsmen and women on the shop floor, each is held to the very highest standards, Fleming's own as well as those of third parties. Having made extended offshore passages aboard Flemings, often in tempestuous conditions, I can attest to the value of this quality and compliance oriented approach, as it affords those aboard peace of mind, and confidence in the vessel's seaworthiness.

The resulting product, an amalgamation of Fleming's extensive yacht building and passage making experience, thoroughly vetted designs and high quality construction, as well as compliance with third party standards, comes at a price, albeit one that I believe is well worth paying.



ISO Categories, What Do They Mean?

A: (all Flemings are built to meet this, the highest, standard)

Designed for extended voyages where conditions may exceed wind force 8 (Beaufort scale) and significant wave heights of 4 m and above but excluding abnormal conditions, and vessels largely self-sufficient.

B: Designed for offshore voyages where conditions up to, and including, wind force 8 and significant wave heights up to, and including, 4 m may be experienced.

C: Designed for voyages in coastal waters, large bays, estuaries, lakes and rivers where conditions up to, and including, wind force 6 and significant wave heights up to, and including, 2 m may be experienced.

D: Designed for voyages on sheltered coastal waters, small bays, small lakes, rivers and canals when conditions up to, and including, wind force 4 and significant wave heights up to, and including, 0,3 m may be experienced, with occasional waves of 0,5 m maximum height, for example from passing vessels. Significant wave height is the mean wave height, trough to crest, of the highest third of the waves. Some will be larger; one in 100 may be 50% larger.