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THE UPS AND DOWNS OF VALVES

product design, Honan says, "Hollow stem valves continue to be more common place with high-end engine builders. These have the benefits of mass reduction and column strength compared to a smaller diameter stem option. Xceldyne employs specialized machining, such as custom-built CNC control gun drilling machines and other proprietary I.D. finishing techniques in order to control surface finish and concentricity of the hole. Xceldyne

continues to refine its design and manufacturing process of hollow stem intake valves, and has also seen a significant increase in the use of sodium-filled hollow stem exhaust valves"

How is the racing market changing? "We are finding that as engine builders and race teams push higher rpms, they continue to look for the lightest weight, most reliable valvetrain components. Many grassroots racers might like to run lighter weight combinations but it all depends on the rules set by their sanctioning body whether they are able to use titanium components."

SB International cuts a wide swath in the market by offering general automotive, heavy-duty diesel, agricultural and marine valves, as well as a performance line aimed more at the local Saturday night racer.

The majority of SBI's sales are for popular auto, truck, import, and heavy-duty diesels. "When it comes to units sold," says SB's Brian Bender, "it's the 60-series Detroit Diesel and the second position is the Chevy 350 and then the 71-series Detroit four valve. Other popular engine configurations are the 16-valve 2.4L and 3.0L 24-valve single overhead cam Chryslers."

SB's newest effort is aimed at the big diesels, but Bender says it's a tough proposition. "If I compare the diesel market to the automotive market, I see the demand for valves declining." He cites reclaiming or remanufacturing, recycling junkyard parts and the fact that engines are just lasting longer. "We're starting to release valves for the Cummins ISX and ISM. Heavy-duty diesel, due to regulations, more people are rebuilding older engines. Newer engines have a high price tag."

Bender says he sees two distinct types of customers. "One will buy for quality and the other buys for price. Or, in some cases, they reclaim parts."

Looking forward, Bender says, "It's still too early to tell about hybrids." But, he points out, "Flex fuel engines use 238N (ultra high stainless steel) and inconel valves. And there are some new materials being used in valve seat inserts. The old material used to be cobalt-based alloys, but due to the price of cobalt, some companies have designed proprietary iron-based alloys to replace it in the alloy."

Schumann's Dynamic Performance (SDP) does 90 percent of its work in racing parts with oil pumps, pushrods and valve train pieces making up their top three sellers. SDP offers 23 degree SBC high performance valves in 5000, 7000 and 9000 Series models to professional engine builders. The number of the 5000 and 7000 series corresponds with the amount of valve spring pressure rated (i.e., 7000 Series is for 700 lbs. of valve spring pressure). Verne Schumann says its 5000 Series valves are made with conventional Hard Chrome straight stems with a micro finish that ensures long lasting valve guides. They can be used on hydraulic or flat tappet solid lifter racing camshafts up to 7,000 rpm.

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These valves are forged non magnetic 21-4N one piece construction with optimum grain flow patterns throughout the valve. "They are compatible with the 1,400° F exhaust valve temperatures of today's racing engines," says Schumann.

By comparison, the Schumann 7000 Series is engineered for 700 lbs.-plus roller cam valve springs. The Extra Duty Series exotic alloy valves are compatible with 1,600° F ultra high temperatures that can be experienced in today's extreme output performance engines. The one-piece forging has absolute grain flow throughout hard chrome stems with micron finish and have extreme undercut profile for ultra high air flow.

Schumann explains that "taper stem technology" helps provide more consistent in-service operation. "Most valves are made with a straight stem," he explains. "They can get tight at the bottom of the guide as they expand from the heat. Scuffing on the bottom more than the top of the valve equals an inconsistent clearance. Tapered exhaust stem expansion is .0008" to .001". And tapered intake stem expansion is .0002" to .0003". There can be a 300° F temperature difference at the guide, which then cools down as you approach the keepers. So as the valves warm up, heat-compensated guide-to-valve stem clearance means they are accurate."

Schumann's 9000 Series high nickel content stainless steel (1,800° F racing temp.) valve is precision forged for optimum grain structure and solution heat treated for total penetration. "The valve stems are Melonite processed at 1,000 Vickers hardness and offer up to 10 times oil retention over hard chrome finish. Taper stem technology is used here, too. Open radical camshaft lobe designs and open limit valve spring pressures are acceptable for the 9000 Series."

Tony Avila of Precision Engine Parts says his company's product catalog has grown to include over 10,000 part numbers, including racing and OEM parts, as well as a new line of Rheanflo valves. "These valves came out last year and use a unique knurled pattern for contact with valve guides. Currently they're only available for small- and big-block Chevys, but they're very popular," says Avila. "It's fair to say they are flying out the door - we're

shipping them as fast as we can make them."

Avila explains the valve's design has been field-proven - literally. "The design came from Israeli tanks that are air cooled. I know the grooved guides have been around but customers either love it or hate it."

Precision Engine Parts also offers a new titanium valve design that came from Germany. Used successfully in Viper series racing, this valve design is comprised of 10-11 percent aluminum and are available for small- and big-block Chevys.

Looking down the road for trends, Avila says, "I see every one using 8mm guides and valves. I think the whole industry will change from 11/16" before too long. This will also yield lighter retainers and valve springs."

Multi-valve heads are among PEP's customer's requests this year. "I'm being asked more for the Ford 4.6L valves, especially the three- and four-valve than the two valve configurations. I attribute it to the drag racing guys. They are racing new stuff."

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