



Cutting NEWS

EXOCARB®-WXS END MILLS Proven Technology for the Die/Mold Industry

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Molding Our Lives with Plastic

Mike McQuinley, District Manager



There are many different types of mold in terms of moldmaking. Die cast mold, extrusion mold, and thermoplastic, just to name a few. Plastic components, in particular, are incorporated in a great deal of our lives. If you

take a look in your home, you would notice that we are constantly surrounded by plastics. From a soda bottle to a cosmetic case, to parts on your computer keyboard, are all products made by the die mold industry.

A mold can be a simple piece of equipment that molds simple parts. It can also be a complex piece of equipment that allows functions to be performed inside the mold cavity such as decorating or assembling the part to save time and money on secondary operations. In general, the cost of a mold is determined by its complexity, size, process type, and design requirements of the plastic component being molded.

“If you take a look in your home, you would notice that we are constantly surrounded by plastics.”

Although plastic products have been around for as long as most



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people can remember, moldmaking actually did not become a major industry until the 1940s when thermoplastic was developed. Applications began to flourish after injection molding presses were designed. Since then, molding has grown significantly as plastic products became an integral part of our everyday lives.

As many economists predicted, the moldmaking market this year thus far has been rather dry. The American Mold Builders Association (AMBA) estimates that there are approximately 2,500 to 3,000 mold manufacturing companies in the United States. The recession of 2008 and 2009 caused nearly 500 moldmakers to close their doors, according to AMBA. Although

“Plastic is everywhere, and it will always take a mold to shape their components.”

the economic health of the manufacturing industry is predicted to improve this year, many sectors will remain slow.

Despite such economic turmoil, all is not doom and gloom. Opportunities are created as global manufacturing

expands and evolves. In a 2010 spring business forecast survey conducted by AMBA of existing mold companies, 42 percent rated current conditions as good to excellent. Let’s also take notice that many products around us, like Jelly Belly’s jelly beans and Hershey’s chocolate bars, are manufactured by American mold companies.

Mold manufacturing is a support industry to all other industry segments that make plastic components, parts and products. The world we live in would be quite a different place without mold manufacturers to design and build molds and dies for the various plastic products that surround us. Plastic is everywhere, and it will always take a mold to shape their components.



Short Cuts

Green packaging

The growth of green packaging has been steadily increasing as consumers, retailers, and packaging suppliers adopt packaging solutions that minimize their impact on the environment.

Some methods to reduce this impact include incorporating recycled content and biodegradable materials into the packaging, and developing reusable packaging. Additionally, many converters, including thermoformers and injection molders of plastic packaging, are decreasing the amount of material used in the packaging through thin-walling and/or light-weighting the packaging.



Technical

Is There a Better Shrink Fit System?

Steve McBride, Product Specialist



There are a variety of Shrink Fit Toolholding Systems on the market, all of which use thermal contraction to grip cutting tools. However, while most Shrink Fit holders are one-piece type, OSG has improved upon this design with our “hybrid” Shrink Fit System.

The word “hybrid” is defined as “something of mixed origin or composition,” and this is what OSG has accomplished with our shrink fit system; OSG’s holders have the accuracy and rigidity of Shrink Fit Holders, but also the versatility of Collet Chucks.

HOW DOES THE “HYBRID” SHRINK FIT SYSTEM WORK?

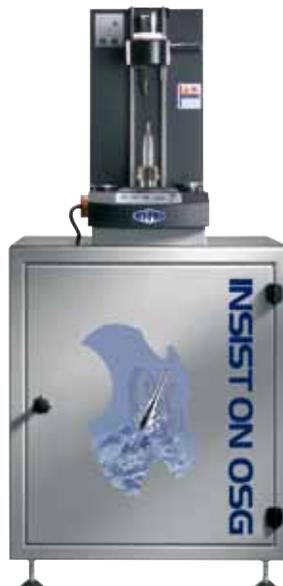
OSG’s Shrink Fit System consists of Base Holders and Shrink Fit Collets:

* **BASE HOLDER:** The Base Holder

fits in between the machine spindle and the Shrink Fit Collet. It has a precision-ground tapered bore and a draw-bar type system to securely and accurately hold the Shrink Fit Collet. OSG stocks Base Holders in standard steep taper (BT and

CT) and HSK styles.

* **SHRINK FIT COLLET:** The Shrink Fit Collet locks into the Base Holder and grips the cutting tool. To insert the cutting tool, the collet must be heated up using OSG’s hot air Shrink Fit Unit. As it cools, it grips the cutting tool with a tremendous amount of gripping force and accuracy. Collet sizes range from 3 to 12 mm (or 1/8” to 1/2”) and are available in Standard, Slim, and Coolant-Through configurations.



HOW ACCURATE IS IT?

Since all surfaces are precision ground, OSG’s Shrink Fit System

“OSG’s Shrink Fit System provides maximum accuracy, reach and flexibility.”

maintains a runout accuracy of 5 microns (0.0002”) or less. This accuracy

is consistently repeatable, since our Shrink Fit Collets are made of a stainless steel alloy (rather than tool steel) and our hot air Shrink Fit unit keeps the heat to a manageable level. This high degree of accuracy allows the customer to machine the part to a finished state without worry.

WHAT ABOUT REACH?

Many shops struggle with reach concerns when first analyzing a job. OSG’s Shrink Fit System is the solution, as we can reach it if the part has at least three degrees of draft. All of OSG’s Shrink Fit Collets feature a three degree draft angle, and our Slim Type Collets have the smallest nose diameter of any Shrink Fit system on the market. Using the OSG’s Shrink Fit Holders with standard cutting tools (rather than EDM or special extended-length cutting tools) save customers considerable money. OSG’s Shrink Fit Collets can also be modified to fit extremely tight spaces, providing further flexibility.

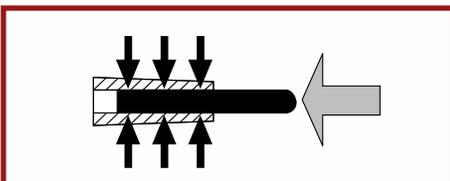
FLEXIBILITY

In addition to accuracy and reach, OSG's Shrink Fit System offers flexibility that others do not. One Base Holder can accommodate a variety of Shrink Fit Collets, allowing customers to keep initial investments low. Also, since Shrink

"In addition to accuracy and reach, OSG's Shrink Fit System offers flexibility that others do not."

MAXIMUM COST SAVINGS

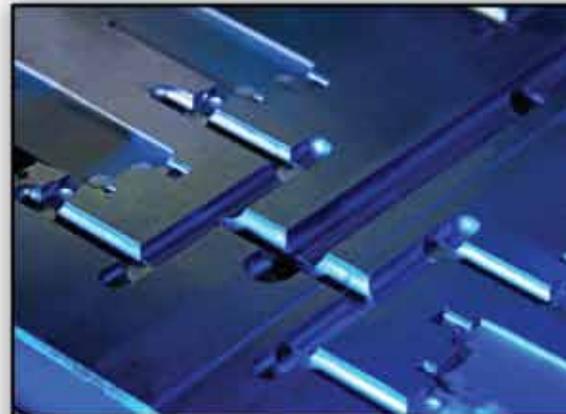
OSG's Shrink Fit System provides maximum accuracy, reach and flexibility, all of which contribute to increased productivity and cost savings. Your customers should consider our system not only for new tooling purchases, but also for improving productivity on existing jobs.



Holding Ability

Compared to other tool holders such as the collet type, this holder has stronger holding ability, and can successfully hold tools during high load operations.

Fit Collets can be used in any Base Holder, customers can use OSG's Shrink Fit System in multiple machines simply by purchasing new Base Holders. This is particularly helpful since a shop can get greater versatility out of existing tooling when they purchase new machines.



Short Cuts

Demand for molds in plastic packaging continues to grow

Plastic packaging continues to represent some fair opportunities for injection molders, and greater business for moldmakers.

Thermoforming has evolved into high-speed and deep-draw forming technology that allows for greater volumes, particularly in applications such as Deli containers and containers for margarine and dairy products such as cottage cheese and sour cream, according to The Freedonia Group.



OSG Insider

How Do You Tap Hardened Steel?

Mike Workman, District Manager

In my 11 years of employment as a District Manager at OSG Tap & Die, I am constantly asked, "what do you have for tapping hardened steel?" My first response is always "how hard is the material?"

The answers will usually range between 40 - 60 HRC. Customers often are just trying to open up threads that have shrunk from a heat

treating process. Obviously, there is a great deal of machine time in finished parts. It is nearly impossible to drill and tap the final hardened product after heat treatment. A shop's

worst nightmare is to have finished parts return from the heat treatment process and discover that they left out a threaded hole.

Hardened steels have good dimensional stability combined with high resistance to tempering. Machining these materials is difficult. A careful selection of cutting tools and appropriate machining conditions is critical.

Recently, a die/mold shop in the Northeast region called to ask for a recommendation. Brian, the owner, was looking for tooling to drill and tap A2 tool steel, which was 57 HRC. He was trying to salvage several dies that were missing a 1/2" - 13 threaded hole.

I recommended OSG's EXOCARB®-SH-DRL drill (list 5170) and EXOCARB®-VX tap (list 311). EXOCARB®-SH-DRL is a 2-flute carbide drill with a 12-degree slow spiral and multi-layer TiAlN

coating. EXOCARB®-VX is made of a solid carbide material. It has a rigid straight flute design and is coated with OSG's

special V coating. What makes this combination great is that these two tools are sold together to specifically tackle the impossible task of tapping hardened steel.

Brian's machine setup had to be extremely rigid. His machine was a new Makino with a CAT40 spindle. The drill needed to have minimal runout of less than .0005." As with any tool, excess runout will cause short tool life and even tool failure. Heavy cutting oil was recommended as a lubricant for drilling the hardened steel. Another key factor to successfully tapping hardened steel is the percentage of thread. Drilling the hole size for 55 - 60 percent thread will ensure good tap performance.

For the 1/2" - 13 hole, our choice was an 11.2 mm diameter drill. The recommended speeds and feeds for this drill in A2 tool steel was 375 rpm and .0015" IPR. OSG's SH-DRL was able to make the drilling operation easy even with hardened material at 57 HRC.

Next, the challenge was getting the tap to perform as well as the drill. Once again, the success would rely on a secured machine setup. The Makino had a rigid tapping cycle and the VX tap was held in a rigid tap driver. The tap speed recommended was 5 - 8 SFM with a feed rate of .076" IPR for the hardened steel. A heavy cutting lubricant was recommended for the tap as well.

Brian had 13 die plates that he drilled and tapped successfully. Upon inspection of the drill and tap, it was noted that there was no chipping or signs of wear. The tools looked as if they were never used! Brian was able to salvage all of the hardened parts by using OSG's EXOCARB®-SH-DRL drill and EXOCARB®-VX tap. What was once considered to be an impossible task became a reality with OSG tools!

The use of hardened materials in industrial processes is becoming more prominent, creating great demand for new and innovative designs of cutting tools capable of machining under extreme working conditions.

OSG's EXOCARB®-SH-DRL drill and EXOCARB®-VX tap are specifically designed for hardened materials. They should be of great interest to any manufacturing company working with hardened steels up to 65 HRC.

"A careful selection of cutting tools and appropriate machining conditions is critical."



Twitter

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Follow OSG on twitter at <http://twitter.com/OSGTOOL> to receive instantly updated information from us!



Get updates via SMS by texting follow **OSGTOOL** to **40404** in the United States.



Short Cuts

Injection grades of Mirel granted FDA food-contact certification

Two injection molding grades of Telles' polyhydroxyalkanoate (PHA) Mirel bioresin have received U.S. Food and Drug Administration (FDA) clearance for use in food-contact applications. Effective May 11, Telles' Mirel F1005 and F1006 received FDA clearance.

Specific to non-alcoholic products, potential applications for the newly cleared grades could include injection molded forks, spoons, knives, tubs, trays, hot cup lids, and caps and closures. Given Mirel's properties, usage conditions can run the gamut from frozen food storage to boiling water up to 212° F and microwave reheating. Commercial grades of Mirel are available for injection molding, cast sheet, thermoforming, and film applications.

Catalog Corrections

2010 Cutting Tool Solutions Catalog Corrections

Page# 71: List 233 has a point angle of 150° not 118°.

Page# 453: List 7230 had incorrect table headers. The following chart has been corrected:

List 7230 ULTRA SPEED CARBIDE REC 30° FIT

Die/Mold Series, Regular Length, 2 or 4 Flutes, Ball End



EDP Number	Major Diameter		Length of Cut	Shank Diameter	No. of Flutes	Tolerance		List Price (Each)
	D	L				Plus	Minus	
72300116	1/64	1-1/2	3/64	1/8	2	0	-0.0004	143.77
72300216	1/32	1-1/2	3/32	1/8	4	0	-0.0004	131.27
72300416	1/16	1-1/2	3/16	1/8	4	0	-0.0004	131.27
72300516	3/32	1-1/2	3/8	1/8	4	0	-0.0004	131.27
72300616	1/8	1-1/2	3/4	1/8	4	0	-0.0004	137.51
72300716	3/16	2	3/4	3/16	4	0	-0.0004	150.01
72300816	1/4	2-1/2	1	1/4	4	0	-0.0007	181.26

Testimonial

Score a Bull's-eye with OSG's Bull Nose End Mill

Jacob Van Oost, District Manager

The die and mold industry is a very competitive sector to be in. Shops are constantly striving to outperform competitors by quoting shorter delivery time, better finish and lower cost per unit. With OSG's EXOCARB®-WXS High Feed Bull Nose End Mill, shops are able to achieve faster feed rates, superior surface finishes and better overall cycle times.

A month ago I visited an account that does a great deal of automotive work in Muskegon, Mich. The engineer there asked if OSG had a tool that could speed up a process he thought could be improved. After evaluating the application, we concluded that OSG's EXOCARB®-WXS High Feed Bull Nose End Mill would be a perfect fit.

"EXOCARB®-WXS can help you go faster and also get rid of extra processes along the way."

gasket track going around the hole part. The customer originally had it

programmed with a .25" end mill and was taking 3.25 hours to put in the grove in P-20. After switching to OSG's High Feed Bull Nose End Mill, the program time was reduced to merely 35 minutes!!

We were initially going to start the tool at 1,300 rpm and 715 ipm. As we looked into this program more, however, the engineer said that the machine for this job could not handle such an aggressive feed rate. We decided instead to cut everything in half to 650 rpm and 357 ipm. With a light depth of cut, this part of job was completed two hours faster

than the original method, leaving the customer more pleased than ever.

OSG's EXOCARB®-WXS High Feed Bull Nose End Mill can be applied to many applications in die/mold shops. For detailed 3-D contoured parts, it can be used in conjunction with the true 4-flute ball mill. OSG's Bull Nose leaves smaller scallops and has faster metal removal rates than that of a ball nosed end mills, making it ideal for roughing. Smaller scallops makes finishing with the true 4-flute easier and faster. In addition, this Bull Nose allows applications to go from roughing straight to finishing, bypassing semi-roughing altogether!

OSG's EXOCARB®-WXS High Feed Bull Nose End Mill is very rigid and has a long reach capability. The reverse taper on the cutting edge prevents chattering and eliminates dwell marks on side walls. Last but not least, Bull Nose's new WXS® coating oxidizes at around 1,300 degrees centigrade, allowing it to withstand much greater heat than competitor tools that are treated with TiAlN.

If you are in a die/mold shop and want to stay ahead of your competitors, I recommend taking a look at OSG's EXOCARB®-WXS High Feed Bull Nose End Mill. It is a tool that can help you go faster and also bypass extra processes along the way. Take advantage of OSG's guaranteed test order (GTO) today and see what you have been missing!

There was a .25" wide



Industry News

Working Smarter, Not Harder

Mike Duggan, District Manager

In recent years, more and more mold business has been lost to low cost manufacturers overseas. Moldmakers are the first wave of manufacturers affected by the outsourcing trend that pushed manufacturing into China and other offshore locations. With a majority of mold work moving overseas, U.S. mold shops need to become more competitive not just by working harder, but smarter.

In addition to overseas competition, one of the major challenges in the current market is constant demand for shorter lead times. Meeting delivery deadline is utmost critical in today's market. Shops need the capacity to manufacture multiple mold programs concurrently to accommodate today's demand. Often times large mold projects can bog down work flow. A flexible schedule would allow manufacturers to take advantage of any holes and expedite deliveries.

On one of my recent visits to a customer that does metal stamping and plastic injection mold work, I noticed large square blocks of aluminum being left on a bench at their mold department.

The engineer there explained to me that the aluminum blocks are for prototype inserts for prototype parts. They were for the first shot of parts to be assembled and tested. After the prototypes receive approval from the inspection department, the shop would then build steel inserts for the

mold to run production.

Aluminum is a cheap and easy to machine material. Creating the prototype insert and part in aluminum can ensure accuracy while minimizing cost. Once the part criteria are met, the steel mold can then be mass produced to expedite production and delivery. The shop manager has been trying hard to cut cost across the board, and this is the method he finds most effective in getting parts out the door.

As customer demands evolve and market opportunities shift from one place to another, businesses must be willing to reinvent themselves or risk losing out to emerging opportunities and even existing customers. Moldmakers who have developed a clear-cut process to control part supplies and cycle times will have the most success in capturing business in the current economy.



Short Cuts

Steel prices set to climb after new deal

CNBC.com reports that global steel prices are set to increase by up to a third as miners and steelmakers agreed to a groundbreaking change in the iron ore price system. The new deal will raise the cost of anything that uses steel, including molds.

The new price system will lift the cost of iron ore to Asian steelmakers to about \$110 to \$120 a ton during the April-June period, up between 80 percent and 100 percent from the \$60 level at which the 2009-2010 annual contracts were settled. Prices are expected to continue to climb over the summer, according to analysts.

Testimonial

Cutting Ribs, Cost and Time

Ron Portwine, District Manager



During a recent visit with a tool and die/mold manufacturer in North Tonawanda, N.Y., I spoke with the Shop Manager Jason about shortening his cycle times on the EDM machine. Jason's shop has been manufacturing high quality precision cutting tools for the metal cutting industry for over 30 years. They serve throughout the United States and internationally in industries such as aerospace, automotive, marine, firearms and defense.

Jason was looking for ways to save money in the downturn and his focus was on the amount of time the EDM machine is running. Their shop just started building a die cast mold for an electric motor end housing, and the run time has gotten out of control with the EDM.

"If you can show me a way to cut the time quoted for this job it would be a

great help," Jason said.

The mold Jason had on the bench had 16 ribs that were .375" tall, .060" wide at the bottom with 1 degree of taper per side, and 1/2" long. The ribs also needed a .030" radius at the top of the molded part. Fortunately, his tolerances were all plus or minus .010" on the ribs, which gave him some leeway when choosing an end mill for the application.

According to Jason, their biggest profit eater was the amount of time it would take to EDM the ribs and then polish them. The shop recently had completed a similar mold and the EDM time was 43.5 hours, including making the electrode, and another 28 hours for polishing the EDM finish out. To resolve their dilemma, I explained that OSG has a Rib Processing end mill that can do the machining of

"...their biggest profit eater was the amount of time it would take to EDM the ribs and then polish them."

exact track of the hours for both machining time and polishing time. The bet was on with a goal set to 43.5 hours of machining and 28 hours of polishing.

The Rib Processing end mill chosen was the EXOCARB®-SHP (list 4181) with 1.6 mm OD, 12 mm LOC, and 1

degree angle. The work material was H13 at 38-42 RC. After purchasing the end mills, Jason and I sat

down to discuss all the speeds and feeds options to best utilize his Haas VF3 in order to obtain the shortest run time possible. The max revolutions per minute (rpm) was 10,000 in Jason's Haas, which concerned him because OSG's Rib Processing end mill was recommended to run at 11,000 rpm and 20.9 ipm at .0013-.0031 DOC.



the ribs, cut his EDM time completely out, and decrease his polishing time in half. Although Jason was skeptical, he agreed to purchase two end mills for testing and would keep

With his machine having 10,000 rpm max, we decided to run at 9500 rpm and maintain the DOC at the recommended rate of .0013, giving him a feed rate of 12.35 ipm. With the cavity set in the machine, the program loaded, and the new end mill in the spindle, Jason decided to let the machine run overnight. He set the timer to keep track of the total run time for all the ribs. Once the cycle start button was pushed, he verified that everything was working properly

and left for the evening.

The next morning Jason came in not knowing what to expect. He was surprised to find the machine had



completed the whole rib milling operation with the end mill still in good shape. He checked all the dimensions and found everything to be per print. Then Jason looked at the timer and realized the operation completed in 9 hours and 42 minutes! He was very impressed with the run time, the finish, and the lack of significant wear on the end mill.

The next test was polishing time. The tool maker polishing the ribs tracked

every minute. When completed, the polisher noted that it took only 9 hours to polish the ribs to the required finish. He stated that it polished out very easily. He only had to do a draw polish so the molded part would pull out cleanly because the finish after machining was exceptional and needed very little polishing done.

Jason and I sat down to calculate his savings. He was able to cut off nearly 78 percent of the EDM time and 68 percent of the polishing time. This came out to be 52 hours and 48 minutes of time saved from the job. Using the average area shop rate of \$65, Jason's shop saved approximately \$3,400!

OSG's Rib Processing end mill helped Jason and his shop cut costs when the economy is down. Jason agreed that if money had been placed on the bet he would have lost. Jason's shop was also able to utilize the end mills on several other applications, driving costs further down.

At the end of the

day everything came out to this customer's advantage, and has proven that OSG's Rib Processing end mill is the superior way to do ribs in all types of molds!

"At the end of the day everything came out to this customer's advantage, and has proven that OSG's Rib Processing end mill is the superior way to do ribs in all types of molds!"



Short Cuts

Rib Cutters – superb performance end mills for milling

OSG's Rib Cutters are commonly used for milling ribs and small features in small to large mold cavities and cores. What distinguish OSG's Rib Cutters from competitors are their OSG patented nanotechnology coating, accuracy and rigidity.

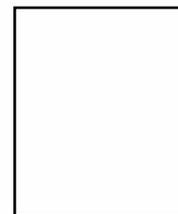
Special features include:

- Seamless ball tangency
- Five-micron radius accuracy
- Multiple stocked lengths of cut
- Ultra-fine micrograin carbide
- WXS and WXL coating

Contact OSG at **1-800-837-2223** today for more information.



OSG TAP & DIE, INC
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Glendale Heights, IL 60139



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BUT DO YOU HAVE OSG QUALITY?

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www.osgtool.com/CN4



ENGINEERED Peace of Mind

In the last 5 years, OSG has released 153 new products or 4824 new items.

Featured Above: New Product #137-138, EXOCARB®-WXS® End Mills

The latest innovation in Hard Milling technology, featuring OSG's proprietary WXS® nano-coating, which yields higher oxidation temperatures and higher hardness for accelerated performance in materials 55-70HRC.

threading drilling »milling