Optimising the Blow Molding Progess With Deformable Die Ring Systems

For almost 30 years deformable die ring systems have been helping moulders save material, achieve critical wall thickness and meet the stringent requirements for automotive components and UN/DOT certified containers.

The conventional die is replaced with a die made from a special flexible alloy that is squeezed and stretched into ovality by two or more servo-cylinders. The effect is to vary the parison wall thickness radially and in conjunction with the 'standard' parison programmer, a much greater degree of wall thickness control can be achieved. This is particularly useful for asymmetric mouldings like automotive fuel tanks.
A controller almost identical to a standard parison programmer is used to flex the die through a sequence of shapes which can be a simple ovalisation or complex shapes with a combination of ovalisation and shifting.

Perfect parison wall thickness control...
The key to meeting critical specifications

Staying competitive means *minimizing* material usage, ***reducing*** cycle time and ***eliminating*** scrap containers.

- ***Minimize*** material usage by programming out needlessly thick sections.
- ***Reduce*** the thick sections that take longer to cool - so you can open the mould sooner!
- ***Eliminate*** rejects by holding wall thickness to closer tolerances

We can provide the compete system consisting of the deformable die ring, servo-cylinders, multi-channel parison programmer and installation assistance.

You can't make a good molding with a bad parison!

It is almost unthinkable to attempt the moulding of complex shaped parts without a parison programmer, and yet this control is only capable of making thickness changes in one axis.

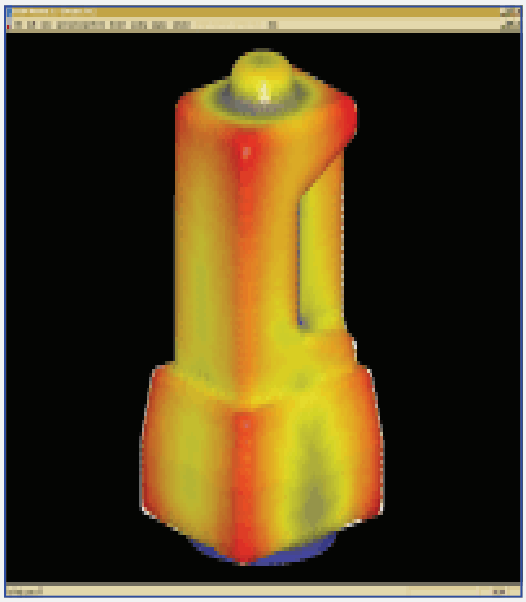
Any moulding that is asymmetrical or has large differences in front-to-back stretch ratio requires another axis of wall thickness control, and this is where our deformable die ring system come in.

By varying the ***shape*** and ***concentricity*** of the die gap you will have a much greater degree of thickness control.

Not only can you shave off vital grams of material, but achieving minimum wall thickness can also be much easier.

Typically, cooling time and distortion can also be reduced.

Payback on investment has been proven time and time again, but how do you put a price on reducing customer complaints, or the damage to your reputation from quality problems?

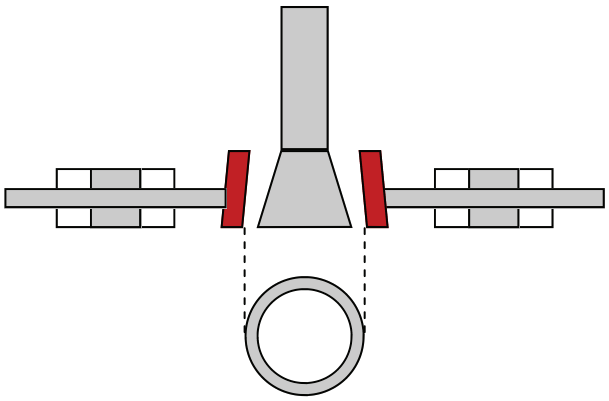


Where does the material go? A simple answer is, - never exactly where you think!
When a tubular parison is stretched into a 3 D shape a complex translation of one 3D shape to another takes place, and carries with it an even more complex variations of wall thickness.

What improvements can you expect from a deformable die ring system?

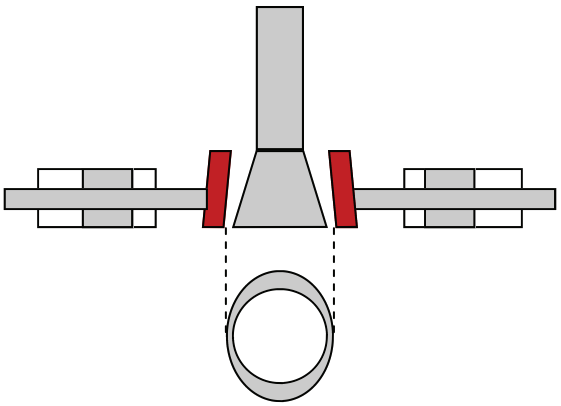
1. Material Saving	Remove material from areas it's not needed. On some parts this can reduce weight by more than 10%
2. Faster Cycle Time	Thick sections take much longer to cool. Eliminating them enables you to open the mold sooner
3. Tighter Specifications	If you're setting the weight of the molding to achieve a minimum wall thickness in specific places then you're probably wasting material in other places
4. Reduced Distortion	Thick sections shrink more than adjacent thin areas which causes distortion and 'paneling' Our 3DX gives you the control needed to eliminate the problem
5. Increased Strength	Excessive wall thickness is one of the most common cause of drop test failure as thinner sections have the ability to absorb energy, like the 'crumple zones on an automobile

Both cylinders in the center of their stroke



Material distributed evenly around parison circumference

Both cylinders pushing



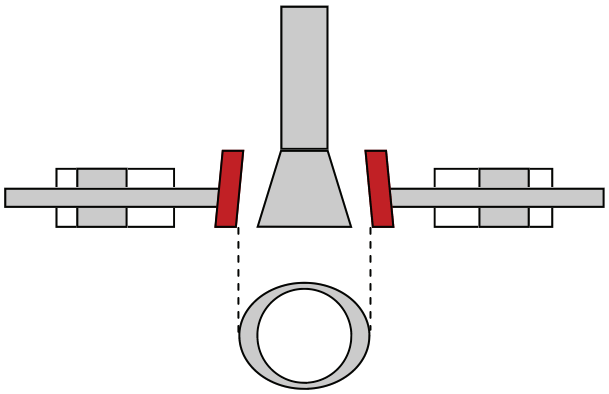
Parison thickness reduced on mould parting line

Machining the die or core shape is one of the techniques moulders have been using for years to improve material distribution, but the shapes profile is only correct in one area of the containers length.

What is often needed is a die shape that changes as the parison extrudes. This is exactly what our 3DX system does. The flexible die, made from a special alloy, is shaped by two servo controlled cylinders.

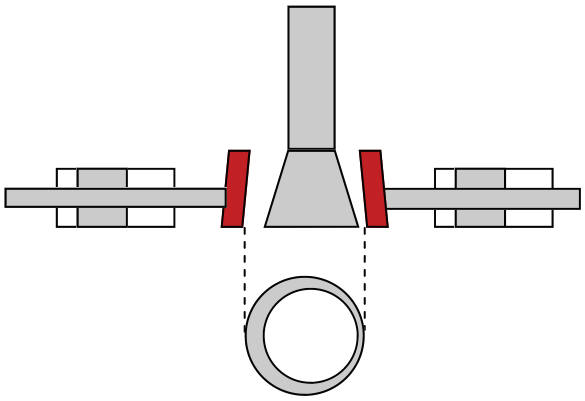
Asymmetric mouldings such as automotive fuel tanks are a perfect application for our 3DX because the die gap changes shape to compensate for the highly irregular contours of these moldings. Even ‘simple’ shaped containers like 55 gallon (210 lt.) ‘L’ ring drums can significantly benefit from the 3DX system.

Both cylinders pulling



Parison thickness increased on mould parting line

One cylinder pulling, the other pushing



Parison thick one side, thin the other

Reducing the excessively thick section near the ‘L’ ring on the mould parting line not only reduces container weight it also improves drop test performance. We can offer systems with die sizes from 80 to 600mm diameter with 2, or more servo-cylinders.

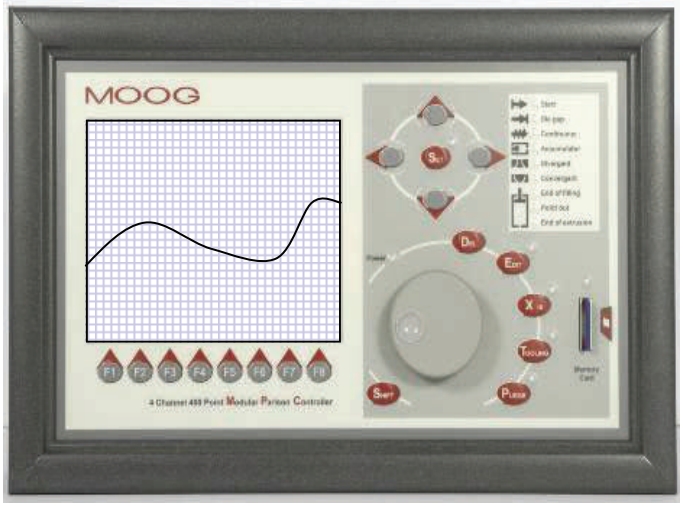
Buying a new machine? - A number of machine builders now can offer our 3DX as a standard option.

Want to upgrade an existing machine? We offer a full turnkey system, no matter where you are!

For over 20 years we have been helping blow moulders to improve the performance of their machines, and we look forward to having the opportunity to help you.

Moog MPC-400 parison programmer... The perfect controller for our 3DX deformable die ring system.

If your interest in our 3DX is for retrofit then your machine will probably need two extra channels of parison programming to control our deformable die ring cylinders.
Wherever possible we work with machinery manufacturers to upgrade your existing controls, but if this is not practical we recommend the Moog MPC-400 parison programmer



The new Moog MPC programmer has up to 400 points of parison profile (user selectable) and can control up to 4 channels.
This means that it can replace your existing parison programmer *and* control the 3DX cylinders.

This 'state of the art' programmer has features such as program storage on internal memory and standard SD memory stick.
The parison marking feature helps identify where the profile is located on the moulding, it also allows you to 'slide' the profile onto the correct position to the mould cavity.

The programmer can also be linked to a weigh scale for automatic weight correction. This feature enables you to run nearer to the 'bottom limit' without risking underweight rejects.

The Moog MPC-400 is also an ideal replacement for machines with obsolete parison programmers like the old Hunkar 320, 311 and Moog pin matrix models. Machines producing containers from 25 Lt (5 gallon) upwards can often benefit from more program points, and the MPC-400 is an excellent technology upgrade.

The system is compatible with existing servo valves and transducers, and trade-in's may be available for your old programmers.

Statically Deformable Core

Eliminates tedious shape machining, enables faster, more accurate optimization

Complementary to our 3DX deformable die ring, the SDC device enables you to shape the inner tooling to the ideal profile for jerry cans and other non-round shapes. Instead of die-grinding the profile which can absorb hours of skilled time, this device enables the profile to be optimized simply by setting a series of screws. Unlike machining, adjusting too far is not a problem because the adjustment can always be turned back.

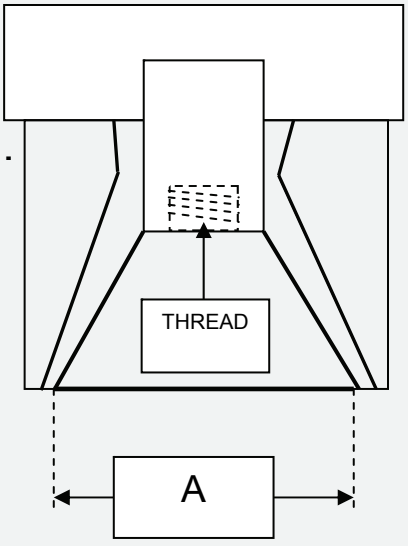
The flexible section is made of the same special material we use on the dynamically flexible die, so the shape always returns to its round condition if the adjusting screws are loosened. The device requires no maintenance and is available in a range of standard sizes for containers as small as 5Lt (1 Gallon) 'F' style jerry cans to automotive fuel tanks and flat panels.

Even if your die tooling already has a profiled shape it is still possible that further weight savings could be made by our SDC because the easier optimization inevitably enables more accurate settings to be achieved. The SDC is available as a standalone device without the dynamically deformable 3DX system.

Want a quote for a SDC?

Send us a drawing of your existing die tooling. For quotation purposes we only need some basic information.

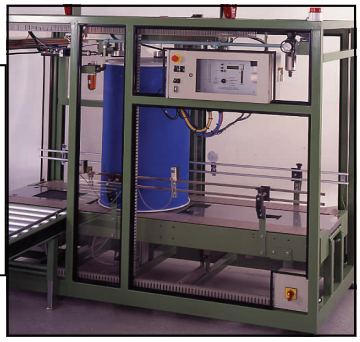
To supply the SDC we will need accurate dimensions!



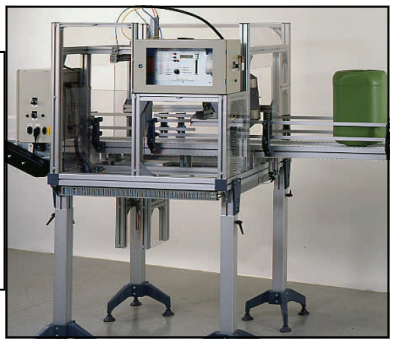
BMC PRESENTS…

Some of our other products

Leak Testers can do **much more** than just find leaks.
This fully Automatic 'L' ring drum tester that rotates the drum to align the necks with the test heads. Automatic check weighing so you never ship an out-of-weight product again. We can even correct the parison programmers setting to maintain container weight to tighter limits.



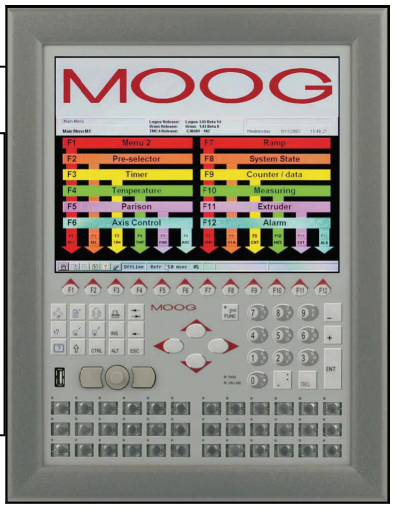
Fully automatic or hand loaded, high tech or basic, we have a model to suit your needs.
Small bottles or 1000 lt IBC's
Free standing, or integrated into your trimming/down stream automation.
Calibrated to DOT/UN pressures with full testing traceability.



Is your machine control system obsolete?

The biggest cause of machine unreliability is the electrical system, and the problem is made worse if you have an obsolete control such as the Maco 8000, Siemens S5-100, etc.

By retrofitting the new Moog TMC-4 your machine will not only become more reliable, but you will discover how user friendly modern systems have become.
Our service includes programming, installation, training and full documentation.



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