

At Van Wert, Ohio

The stamping operation at Federal-Mogul Corporation's National Oil Seals plant in Van Wert, Ohio has, over the years, evolved to smaller job lot sizes. Production of a broad variety of seals for the vehicular industry requires many, many die changes in a 24 hour period. Ron Oswald, Plant Tool Engineer says, "To stay competitive in today's market you've got to change those dies pretty quickly."

Federal-Mogul Corporation first proved out the Minster Die-Namic Process in the plant's assembly department in 1968. From there they expanded their use of Die-Namic O.B.I.'s into secondary operations in the metal stamping department. Oswald says "Now, we've gone into the E2D - 150 ton straightside Die-Namic presses with 'D-1018' fixtures and it really fills the bill for us. Our runs on these presses average 1200 to 1500 pieces, ranging from as few as 300 to 30,000. We often set over 120 dies in a 24 hour period."

- A. Unitized seal outer case first operation
- B. Second operation on unitized seal outer case reforms the inside
- C. Finished unitized seal
- D. First operation on Teflon seal mandrel for replacement parts. The second operation puts a slight curl on the open end and the third operation pierces out to the I.D. (This part is very critical on diameter, scratches and out of round.)

Have they reduced die-setting time? According to Paul Shock, Tool Engineering Aid, "With Die-Namic, our changeover time from finish of one job to starting to run the next, has been reduced from an hour and twenty minutes to fifteen minutes." (Five times faster!) "This is significant when our part runs may only last 40 minutes."

Die-Namic Die provide Better Alignment - Greater Accuracy

The Van Wert plant uses 18 "Master" Die-Namic dies on which components can be changed for part variations. They also have three permanent compound Die-Namic dies. All the tooling for the five O.B.I. Die-Namic presses is built around components added to the master dies. "In building Die-Namic dies, we get better alignment right from the start using the alignment fixture," says Shock.

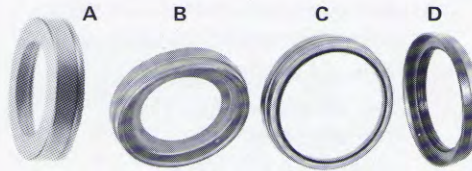
"One reason that Die-Namic does such a good job for us is that everything is **kept** in alignment," reports Oswald. "We feel

secure in building up the master die ahead, with the next job ready to go. We have no problems running the Die-Namic presses as far as the parts coming off them are concerned. When you set conventional dies you don't have the same accuracy. You never really set them the same way twice.

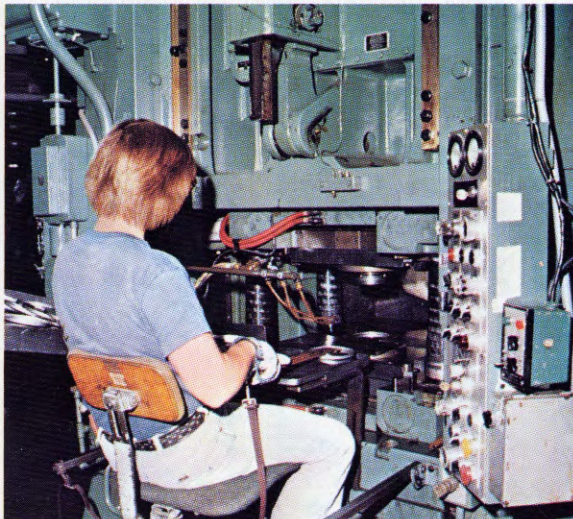
If an operator tightens one side down too hard he can actually slide the die and a perfectly sharpened die can be burred on the first stroke. We just don't have that problem anymore."

Federal-Mogul also has found that their use of Die-Namic quick change dies and presses eliminated the problem of bolster and T-slot damage and repair often encountered with conventional dies. They get better under-the-die support and no longer have the annoyances of varied die shoe thickness, shortage of clamps, bolts and knockout pins.

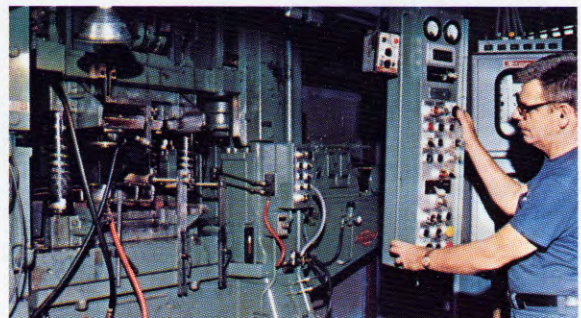
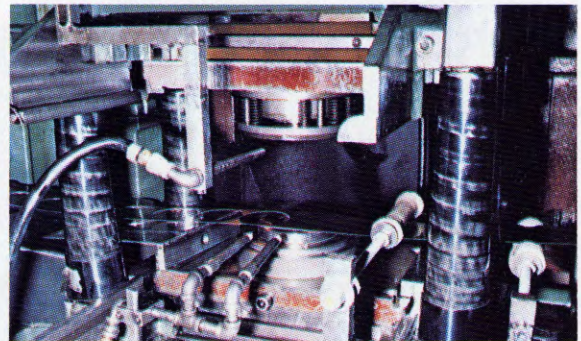
Ron Oswald summed up his firm's satisfaction with Minster's Die-Namic Process this way. "We believe in Minster. Over the long haul, for us the Minster press has proven to be a fine piece of equipment, and in the metal stamping department the secret to our further success is Die-Namic."



Close-up shows Die-Namic fixture and upper and lower dies in a 150 ton E2D coil fed press at the Van Wert plant of Federal-Mogul.



This Minster E2-150 ton Straightside Die-Namic press is hand-fed for secondary operations.



Automatic E2D-150 Die-Namic press with 1018 fixture is used for first operation blanking and forming.

improves accuracy with Minster's *Die-Namic*[®] Process

At Frankfort, Indiana

Frankfort, Indiana Plant Converting to Die-Namic Process

In 1974 the National Oil Seals plant in Frankfort, Indiana purchased two Minster No. 6 Die-Namic O.B.I.'s for use in their assembly department. Their experience with the process led to the purchase in 1979 of three P2D-60 Straightside Die-Namic presses. One is equipped with a 'D-810' fixture and is used for part runs from 200 to 100,000, with the average run between 2000 and 3000 pieces.

Currently the plant has ten different "master" dies capable of running 250 different part numbers. They also have fifteen compound dies with nine more on order.



Federal-Mogul National Oil Seals Division produces a variety of seals for automotive and off-road equipment applications.

DIE-NAMIC DIE ALIGNMENT IS "SUPER"

Dave Royalty, Senior Manufacturing Engineer, states, "We had some concern about whether or not the Die-Namic Process could handle the close clearances in our dies (.00025" on a side between the upper die and the blank) but so far everything's been super. We've checked the parts and looked at the shear in the piercing, looked for ironing on one side of the part. From what we've seen, we're getting just super alignment, as good as we've ever had in a conventional die set."

Steve Nickols, Jr., Manufacturing Engineer, advises that die-setting time in the P2-60 press is 1/3 that of conventional dies. "There's a lot less chance of human error when setting Die-Namic dies. It's made the procedure closer to fool-proof. And another thing, it's easy for us to slide out an upper or lower die to tighten bolts,

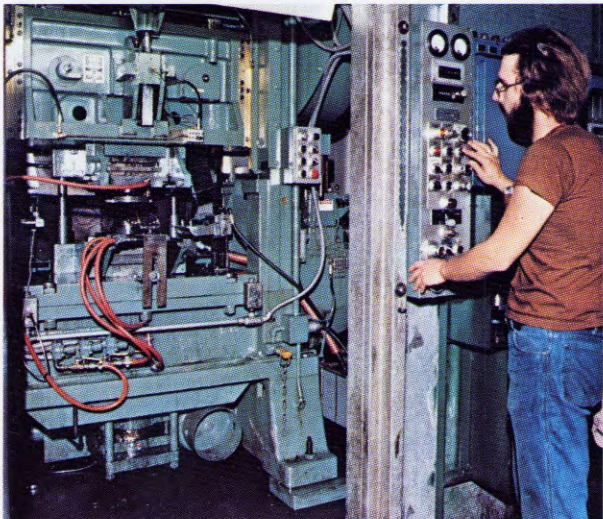
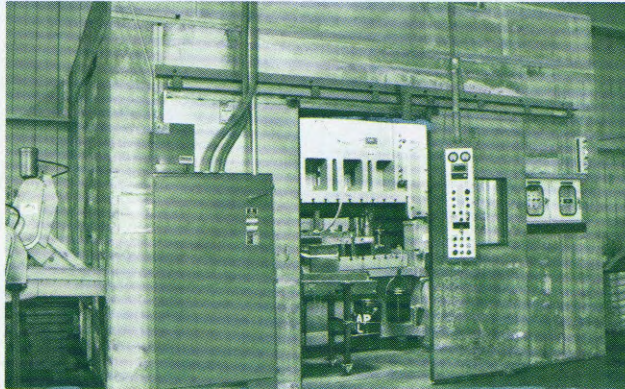
sharpen a punch, etc., and just slide it right back in."

Of their program to convert to Die-Namic dies, Nickols stated, "We've got two groups of twenty-five Die-Namic die plate sets on order. After those come in, I'm sure we are going to be ordering more because we plan to keep right on converting to Die-Namic dies."

Federal-Mogul is currently using just one of their three P2D-60 presses for Die-Namic production, but as their conversion program continues, they will need fixtures for the other two presses. In fact, a fixture for the second P2D-60 is already on order. "We're converting about two dies per week to Die-Namic, but we may accelerate that program because we have from 600 to 700 we'd like to convert in the next few years. We've also built several new dies on Die-Namic plates," Nickols concluded.

For a plant that runs three shifts per day and makes 5-6 die changes per shift, the Die-Namic Process is obviously paying off in more ways than one.

Enclosed E2-300 progressive die press, one of eighteen Minster presses installed in the Frankfort plant.



Minster P2D-60 Die-Namic Straightside press with D-810 fixture is housed in a noise enclosure. This press utilizes ten "master" Die-Namic dies and fifteen compound dies.

