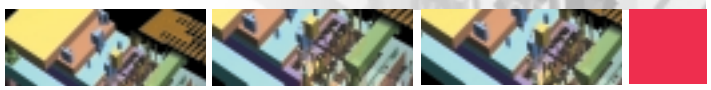
The complete solution for the progressive die manufacturer

Maximizing quality and productivity through intelligent automation of industry-specific processes

white paper:
NX Progressive Die Wizard



Progressive die manufacturers face a number of issues that hold back improvements in productivity, quality and turnaround time. These issues include a lack of experienced progressive die designers, the difficulties involved in speeding up and improving quality in the more traditional design methods and a shortage of any specific, easy to use, productive software solutions for progressive die design. NX Progressive Die Wizard provides specific knowledge-enabled tools to provide breakthroughs in productivity and quality that companies need to meet their customers' demands.

NX

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Introduction

Process wizards capture the industry's specific process knowledge, promote the most efficient workflow and link complex elements of design technology into automated sequences. The productivity gains can be two and three fold and in some cases even greater. Ironically, the more complex the process, the greater the value and benefits realized. What once was only in the minds of experts can now be easily utilized by less experienced users.

Embedded process knowledge

Most companies today face an increasingly competitive marketplace where there is a constant drive to provide differentiated products within shortened delivery time. Progressive die design and manufacturing is a pillar industry for computer, electronics, automotive and electrical appliances. The requirements for progressive die design and manufacturing are becoming more stringent as shorter delivery times, higher quality requirements and more innovative designs stretch capabilities.

Progressive dies are used to transform flat strips of metal into a formed part. This transformation is performed progressively by a series of stations that cut, coin, form and bend the material into the desired shape. The progressive dies that perform the various operations on the material are unique for every design. The various components that make up the die are located and guided in precision cut openings in plates, which are in turn located and guided by pins. The entire die is actuated by a mechanical press that moves the die up and down while also feeding the material through the die, progressing it from one station, to the next, with each stroke.

In order to maintain their competitive edge and survive, more and more progressive die companies have adopted 3D design technology. NX takes 3D design a step further with specific knowledge-enabled tools that provide the break throughs in productivity and quality that companies need to meet their customers' demands.

A highly iterative process

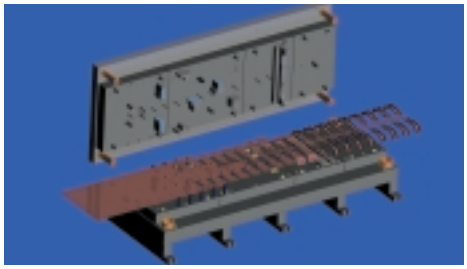
Progressive die design is a relatively complex and highly iterative process. When a die company receives a design from a customer it is common practice to remodel these parts with its own sheet metal design system, using the original 2D drawings or a 3D model, from the customer. The next step involves process planning, which includes unfolding, blank layout, scrap design and strip layout.

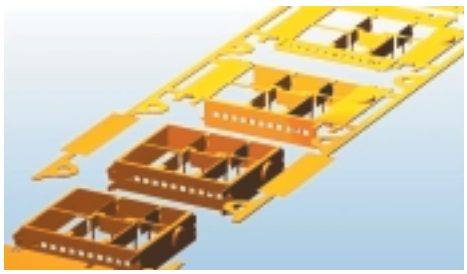
When this is finished, the main die structure must be attacked. This normally includes the die base design, in addition to a great number of inserts, standard parts and relief design, depending on the complexity of the part being manufactured. Typically after this stage is completed, the detailed drawings are produced.

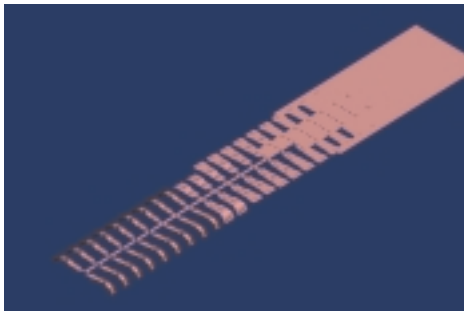
Each step is a relatively manual one. Consequently it can be very time-consuming and expensive. In addition design modifications to the initial component must be run through the entire process manually, largely due to the lack of associativity between the different systems that are employed. Moreover, this requires a great amount of design knowledge and experience.

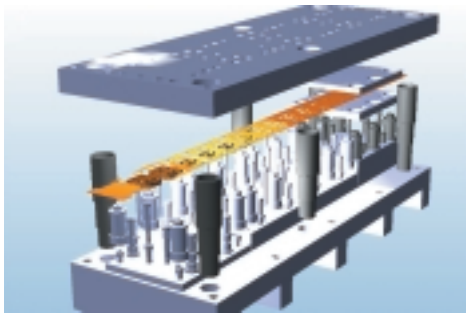
Intelligent automation of industry-specific processes

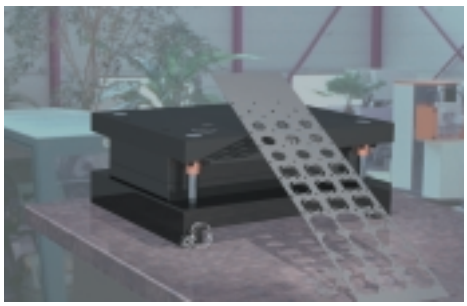
NX Progressive Die Wizard maximizes productivity through intelligent automation of industry-specific processes. Beginning with the receipt of the customer's sheet metal design, NX Progressive Die Wizard guides the user through all of the stages required to construct a progressive die, streamlining complex processes and automating tedious tasks for remarkable time savings. For example, the software's sheet metal recognition feature automatically converts an imported sheet metal model, regardless of its format or the design system it was built in, to a fully parametric sheet metal part. It can convert a model with several hundred features in just a few minutes.











With more than 50 kinds of progressive die features built in, NX Progressive Die Wizard then maps product features to process features in accordance with the company's design standards. Modules such as *blank generator, blank layout, scrap design and strip layout* support a range of progressive die designs including multiple sheet metal parts, multiple rows, multiple strip layouts and custom strip layouts. Additionally NX Progressive Die Wizard provides information about material utilization dynamically, enabling the user to optimize blank and strip layout.

NX Progressive Die Wizard automates the process of strip layout and then simulates operations for immediate feedback. The software also calculates force center and process force. Once the strip layout is complete, preconfigured die bases, advanced die base design tools and more than 10 kinds of standard inset groups are available to accelerate the design of the die structure. In addition, a built-in standard part library includes most suppliers' catalogs. Customizable die base libraries, standard part libraries and insert group libraries expedite the die structure design and ensure the company's complete process is handled effectively.

Once a 3D solid model of the die is complete, it takes very little additional time to generate as many drawings as needed to help shop floor personnel understand what they are going to build. Highly accurate and detailed drawings are fully associative to the die design. NX Progressive Die Wizard also maintains associativity with the part design though the entire die design process. Because a finished die has hundreds to thousands of components, it is important to carefully control design changes. NX Progressive Die Wizard guides users, giving them tools and full control of the changes.

Embedded in NX Progressive Die Wizard is knowledge that formerly resided only in the minds of senior die designers. As a knowledge-based design system, it incorporates industry best practices as well as the company's strategic intelligence. Design rules and parameters are available in spreadsheet format; the entire knowledge base, database and part models are open for customization by the user. With NX Progressive Die Design, less experienced users can take advantage of guided and intuitive process steps while experienced designers can quickly achieve a higher level of proficiency.

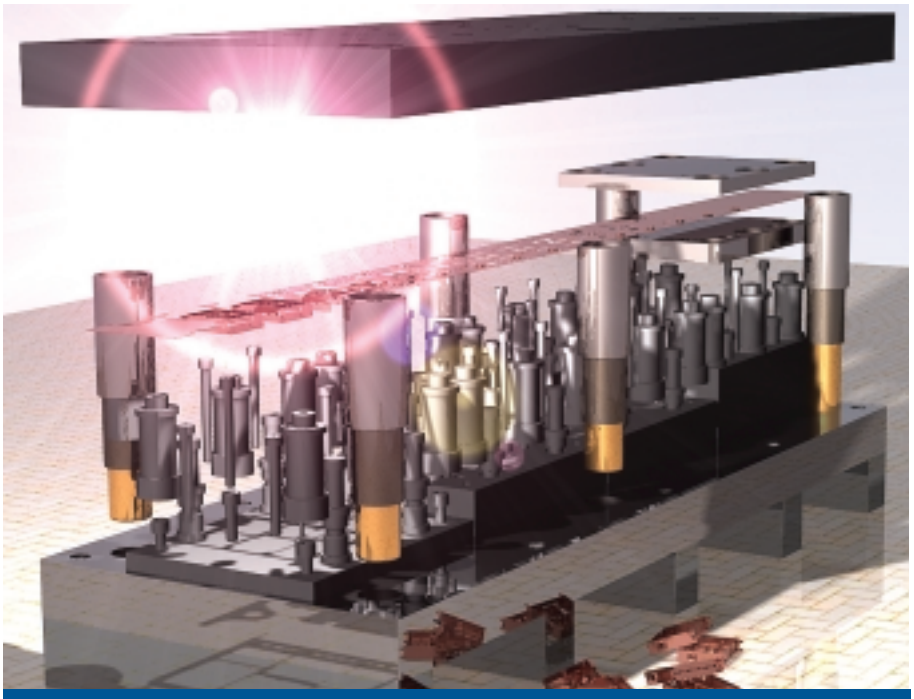


Figure 1.

Summary

NX Progressive Die Wizard provides a complete environment for progressive die design. It incorporates the industry's best practices within a step-by-step user interface to guide users through the steps of designing a progressive die.

With NX Progressive Die Wizard, a company will:

- Dramatically shorten lead time for progressive die design
- Minimize human error and increase design quality
- Minimize design costs through optimal application of manpower
- Easily accommodate changes to product design
- Gain a clear competitive advantage

About UGS PLM Solutions

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Corporate Headquarters

United States
5400 Legacy Drive
Plano, Texas 75024
1 972 605 6000

Regions

Americas
13690 Riverport Drive
Maryland Heights, MO 63043
United States
800 498 5351
Fax 314 264 8900

Europe
Norwich House Knoll Road
Camberley, Surrey
GU15 3SY
United Kingdom
44 1276 705170
Fax 44 1276 705150

Asia-Pacific
Suites 3601-2, Citibank Tower
Citibank Plaza, 3 Garden Road
Hong Kong
852 2230 3333
Fax 852 2230 3200

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