

## Dieflex Platinum: A New Standard in Cutting Rule

The Holy Grail of diecutting-converting is to have the hardest knife edge possible, one which cuts with minimal pressure, and one which penetrates and extracts with such smoothness, the diecut edge is clean and consistent. And of course, it has to be a cutting tool which has a long, predictable, and productive cutting life.

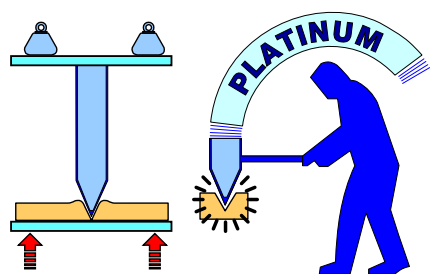
By comparison, the goal of diemaking is to be able to meet and/or to exceed the needs of the diecutting converter, with a knife which is easy to machine, a knife which can be shaped and bent with minimal restriction, and a knife which is effective and consistent in as wide a range of diecutting applications as possible.

**Impossible, right? Well, actually no!** The title of this article is **Platinum, a New Standard in Cutting Rule**, and there is no exaggeration in this title. The new blades from Sandvik, **Dieflex Platinum and Diehard Platinum**, have exceeded the expectations of the most skeptical, the most critical, and the most demanding of international diecutting companies and diemaking professionals, across a comprehensive range of challenging die cutting applications.

From dense to soft and compressive material; from tough sulfates to recycled paper-board; from fluted material to laminate composites; from hard plastic to soft rubber; from fiberglass to gasket substrates; this knife has met and has exceeded the most stringent analysis.

### Why is Dieflex Platinum So Important?

The body of every knife is important to the diemaker in terms of machining and fabricating a bullet proof steel rule die. The base of this knife is the exceptional Dieflex material which has a proven track record for machining, for shaping and for a degree of consistency unmatched in other knives.



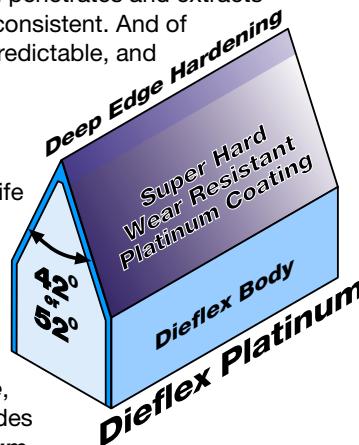
**A New Standard of Excellence**

The cutting edge of every knife is critical to the diecutter, as this is where the entire action of converting takes place. How can this knife be so much better? The body and edge hardness of this blade are enhanced, as well as the hardening depth. Of course, this single feature would provide the blade with a hard, sharp, and long life cutting edge. However, this special feature, of this cutting tool, is an extremely hard surface coating of the edge, which gives the knife an edge hardness far in excess of all previously available products. **(Twice as hard as titanium nitride)** The coating is also extraordinarily smooth, which means **Low Friction - Low Pressure Cutting**, which reduces the chance of dust and loose fiber!

This unique and specially developed surface coating is also extremely hard, which ensures excellent wear resistance, but the Platinum Coating is so thin it does not affect bendability and the coating does not chip or flake, even when the knife is bent to extremely tight angles or under excess loads in diecutting.

### A Cut Above the Rest!

This cutting rule, which is twice as hard as any competitive cutting rule, is available in 42 and 52 degree bevel angles, in 2-point and 3-point, and in coils and meter lengths. For super clean, dust free cutting edges, you have to use a **Platinum Cutting Edge!**



## Alternate Cutting Anvils

There are specialist anvil-diecutting applications, which provide an alternative to both Hard & Soft Anvil Diecutting, and are gradually gaining acceptance. One of the most obvious, and highly effective, is to integrate hard and soft anvil in a single cutting plate. This is particularly useful to compensate for **"Inside-Outside Pressure"** variation, or where a design contains a complex design feature with a concentration of cutting rule.

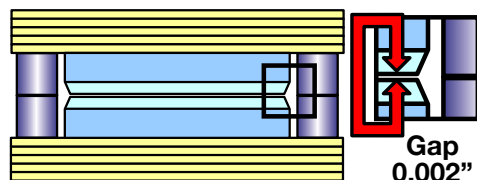
There are **Flexible Anvils**, where a compressible material is inserted between the cutting plate/anvil, and the platen support surface. **See below.** Another effective alternative

is to pre-machine the profile of the steel rule die into a hard steel cutting plate, and is often referred to as **"Invisible Diecutting."** As the position of each knife precisely matches the cutting **"groove"** in the surface of the steel anvil, this die-anvil combination combines both the benefits of the Hard Anvil and the knife-edge protection of the Soft Anvil. **See right.**

Another effective alternative is to dispense with the anvils all together, and to convert the material between two precisely matched and **"mirrored"** steel rule dies. **See below.** This is simple to execute and it proves very effective when cutting dense materials, where smooth diecut edges are critical.

### Summary

The application, the material, and the press technology generally predicate the cutting anvil, however, there are many important innovations in anvil technology which are expanding the quality and the productivity of the diecutting process.



## Dieflex Superbend

The dream of every diemaker is to have a cutting rule, which can be bent to almost any shape, and yet a rule, which will perform well under the rigors of general diecutting applications. **Dieflex Superbend** is a rule with a body of 33, on the Rockwell Scale, but a rule which is edge hardened, to give a very tough, and a highly wear resistant cutting edge.

Both edge hardness and bendability were critical, however, the development requirement was to produce a blade that can be bent and shaped to acute angles. (In this case 160 degrees!)

### SuperBend or Supercut?

Sandvik has the most diverse array of cutting edges in the industry, with each one designed to meet the diverse application needs of the diemaker and the diecutter. This rule was designed to provide a knife, which could handle those complex shapes, which are often integrated into otherwise straightforward designs. The primary goal was excellent machining and bendability, and the hardened edge was

provided so it could stand up to the same compressive forces as the knives in the steel rule die it was integrated with.

The knife proved highly successful at this application, but the surprise was how extensively the knife is being used. Instead of selection as a specialist blade for a narrow range of applications, it is being used as the standard knife of choice by many diemakers and converters.

The machining shaping flexibility meets the diemakers needs, but the cutting performance is far exceeding diecutter expectations!

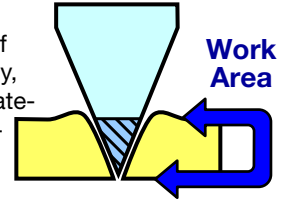
### SuperBend Summary

The base material is Dieflex, the knife is a Skived Edge, it is available in 52 and 42 degree bevel angles, and it can be supplied in coils or in strips.

From design to machining, there seem few restrictions on what this blade can accomplish!

## Choosing an Optimal Dieboard Material

It is important to acknowledge, that the entire focus of diecutting converting, is centered on the amount of the tip of the blade, which penetrates the material. **See right.** Certainly, selecting the most effective knife and edge profile for the material, and choosing a steel rule which can be shaped and machined accurately and consistently, are also important. But it is the dieboard, or more accurately the tool-holder, which plays a dominant role in how effective each knife, and each steel rule is, as they cut-crease-perforate and score the substrate.

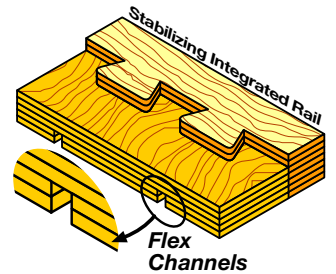
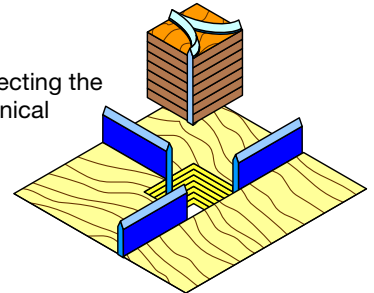


### Key Dieboard Attributes

What are we looking for when we are faced with selecting the best dieboard material? There are generally six technical factors. These are:

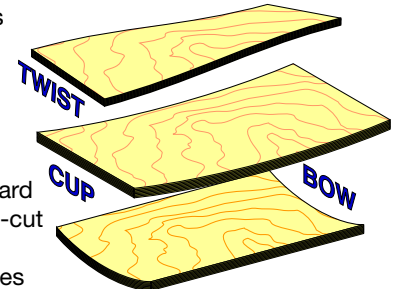
- Consistent Machinability
- Flatness & Stability
- Dimensional Integrity
- Stiffness & Strength
- Property Stabilization
- Application Parameters

Naturally, there are no restrictions on our ability to change the dieboard properties by adding recesses, or integrating multi height plywood, **see above right,** or by integrating flex channels and edge rails, **see right,** to prevent twisting, cupping and bowing. **See below right.**



### The Steel Rule Tool-Holder: Summary

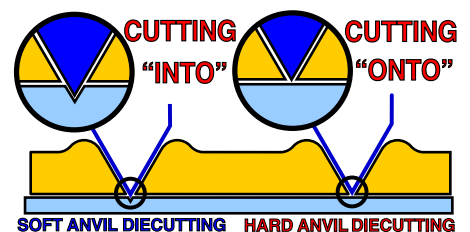
In practice the most common dieboard material is plywood, however, it is difficult to understand why we simply machine the design into the dieboard, and do so little to change, to modify or to enhance the diecutting performance properties of a simple dieboard. There are more than 48 design changes, which can be made to the standard dieboard, to enhance toolmaking, to improve kiss-cut performance, to increase productive output, and consolidate diecut part quality. In successive issues of this publication, we will cover one or more of these dieboard design options, and define the purpose of each modification and how it impacts diemaking and diecutting.



## What is Hard Anvil Diecutting?



There are basically two forms of diecutting. **Hard Anvil Diecutting,** often referred to as cutting **"On-to,"** and **Soft Anvil Diecutting,** often referred to as cutting **"In-to."** See



**right. Hard Anvil Diecutting** is also specified as **"Steel-to-Steel Cutting."** Naturally in this form of diecutting, Z-Axis Control, or precise control of a **"Zero-Gap"** or the distance between the tip of each knife and the surface of the cutting plate is critical to prevent knife damage and wear. **See left. Soft Anvil Diecutting** is also specified as **"Sacrificial Anvil Diecutting,"** in that the penetration of the tip of the knife into the surface of the anvil will eventually require the anvil to be replaced. However, the primary advantage with this form of diecutting, is the critical edge sharpness of the knife is protected from premature damage.