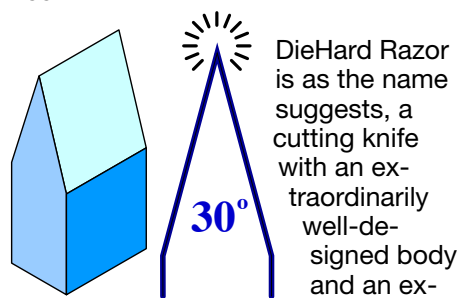


DieHard Razor A Powerful, Multi-Purpose Cutting Tool!

Diecutting is a challenging business in many ways. However, the proliferation of tougher, denser, and harder, plastic, laminated, and composition material, makes a difficult converting challenge even more complex.

Fortunately Sandvik has developed and perfected a cutting rule, which has the pedigree and the attitude to cut through any diecutting bottleneck.

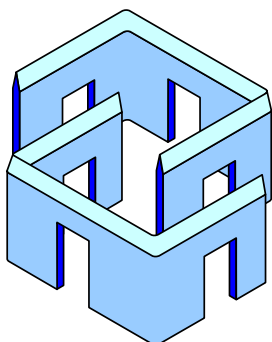


DieHard Razor is as the name suggests, a cutting knife with an extraordinarily well-designed body and an exceptionally

sharp cutting edge. It was designed for the toughest diecutting materials and has proven itself an exceptional performer in a diverse range of seemingly insurmountable cutting challenges.

It has a bright, mirror-like cutting edge of 30 degrees, which has been polished and finely ground to a sharp but wear resistant edge.

It is deep edge hardened, it has a hard, stable body, and the special microstructure of the steel ensures good bending and shaping performance.



Although it was designed for thick and thin materials, and is often applied to the converting of PET plastics and composition laminated electronic materials, it has a range of attributes, which make it an essential cutting tool in every diecutting application.

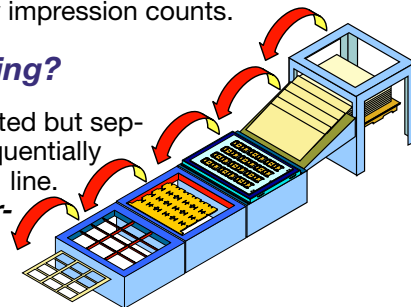
The Key to Diecutting Productivity: "Flying-the-Sheet."

Diecutting is a race against the clock. With smaller orders; shorter lead-time; product, material & process innovation; higher costs & lower prices; and a smaller workforce, every second and every impression counts.

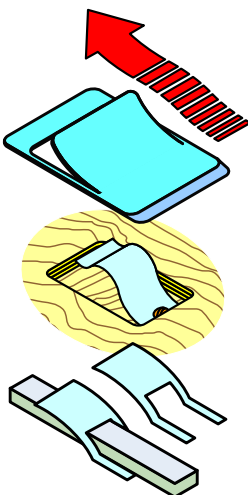
What is Sheet Fed Platen Diecutting?

A Sheet Fed Diecutter is a series of integrated but separate converting processes, which are sequentially organized in a synchronized production line.

See right. Why is this description important?



The key problem in diecutting is **transportation**. Sheet break-up can happen anywhere in this process, however, the majority of breakdowns occur when moving the sheet, from one press unit to the next. A normal make ready is followed by a series of adjustments to improve output performance, unfortunately the operator is generally forced to compromise and accept lower output and yield. **Why does this happen?**



It is obvious that the cause of the sheet break up is excessive lateral tensile stress; which causes the connecting nick/tags to fracture and to fail. This article will focus on one part of the problem, and one highly effective solution, however, in successive articles in Sandvik Solutions we will suggest practical solutions to these universal problems.

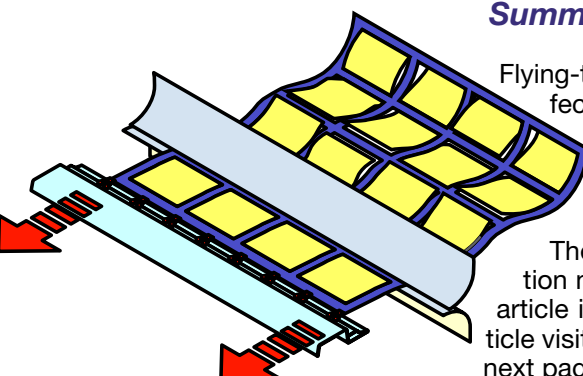
Flying the Sheet

This is a technique designed to minimize the impact of tensile stress on the diecut sheet, and to eliminate diecut parts snagging on tools and press components. The tool used to provide this level of sheet control is called the **Sheet Flyer**, and it should be integrated into all female tools. In the counter, the stripping tool, and in the blanking tool, in one form or another. **See left.** The lower tool flyer is often matched with an upper inverted flyer, mounted in the male tool. The lower flyer provides lift and the upper flyer provides control and ensures precise alignment of the diecut sheet. Together they smooth and align the diecut parts, the waste, and the entire diecut sheet.

The combination of upper and lower sheet flyer is often integrated to form a **"Funnel,"** which is often the full width of the press, and which is positioned between the diecutting unit and the stripping unit, and between the stripping unit and the blanking unit. **See below.**

The combination of upper and lower sheet flyer is often integrated to form a **"Funnel,"** which is often the full width of the press, and which is positioned between the diecutting unit and the stripping unit, and between the stripping unit and the blanking unit. **See below.**

Summary

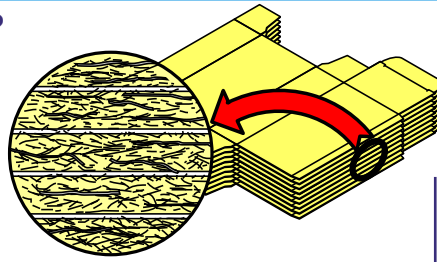


Flying-the-Sheet is a simple, an effective, and a low cost solution, to perennial problems in high speed sheet fed platen diecutting.

The Sandvik Archive identification number for the full text of this article is **U001**. To download the article visit the Sandvik Web Site on the next page.

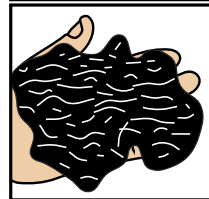
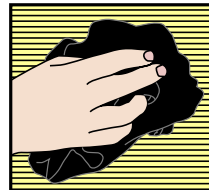
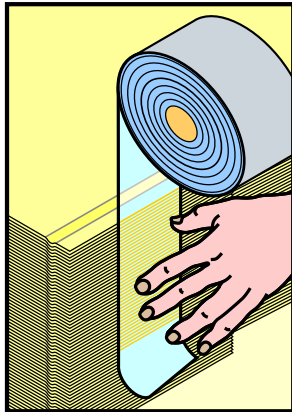
What is Dust & Loose Fiber?

Dust and Loose Fiber are terms used to describe the deterioration in the cleanliness of the diecut edge in platen diecutting. In practice this represents the accumulation of strands of paperboard fiber, remaining firmly but loosely attached to the diecut edge, by secondary fiber, and/or by static attraction. It is important to note these particles are predominantly from the surface of the material being processed. This is particularly noticeable if the sides of a diecut and stripped stack of cartons are examined, as the build up of loose fiber and dust is difficult to ignore. **See above.**



Detection of the Cutting Problem

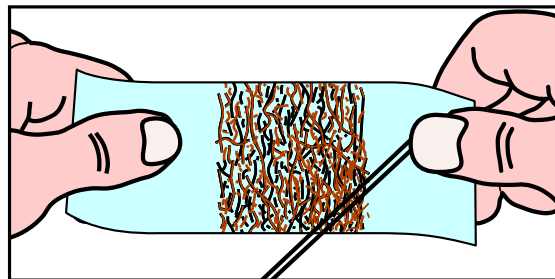
To detect the problem in the earliest stages it is a good practice to brush the side of a diecut load with a clean dark cloth, **see right**, as this will clearly illustrate how severe the developing problem is. Another technique, requires pressing the surface of self-adhesive packing tape to the cut edges of the stacked load, **see left**, pulling the tape free, and then examining the surface of the tape for dust, debris, and loose fiber build up. **See below.**



It is important to recognize there are several problems with the dust and loose fiber breakdown of the process, which include difficulty in downstream processing and serious problems in the customer packaging/cartoning process. Dust and Loose Fiber have several negative impacts on the converting manufacturing process, on the cartoning packaging line, and on the application the container or paperboard device is put to.

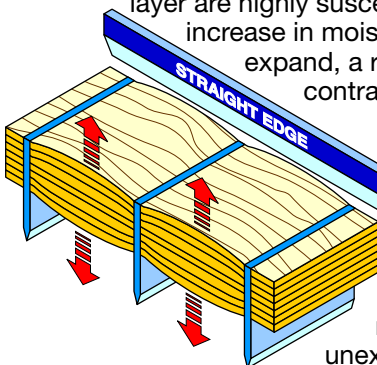
Summary

This is the first in a series of articles to be summarized in this publication and as a full length technical article archived for download on the Sandvik Web Site.



Did You Know?

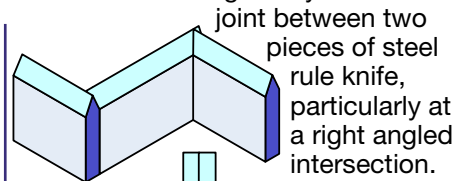
We all recognize the inherent dimensional instability of the plywood dieboard. The cellulose fiber building blocks of each veneer layer are highly susceptible to changes in moisture content. An increase in moisture causes the plywood to swell and to expand, a reduction in moisture causes shrinkage and contraction.



Unfortunately when installed in the press the dieboard is exposed to higher temperatures and increased condensed moisture. If the bottom and top surface of the dieboard is not protected, moisture intrusion into these veneer layers will cause swelling, lifting the rules off their feet, causing premature and unexpected knife-edge damage!

The Miter-Lip Joint?

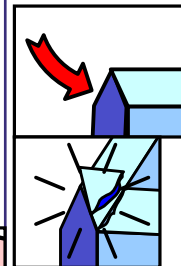
The standard miter or lip joint, **see below**, is the most commonly used method of forming a very reliable joint between two



pieces of steel rule knife, particularly at a right angled intersection. However, there are occasions when this joint is susceptible to failure, and it is useful to modify the joint for those potential problem situations.

A common failure is the rules flex apart, when diecutting thick or dense material. **See below.** This will leave to an ugly tag on the diecut part.

In some design configurations the rules are forced together, with the strong probability the miter or lip extension will fracture and fail. **See below.** A similar problem occurs when the rule being joined to, is machined without bevel support and the end of the knife has "fish-tailed."



The most effective solution to all of these problems is to extend the rule being joined, and to bevel the excess rule at an angle to the surface of the dieboard. **See below.**

This simple change will reinforce the joint and make this critical intersection virtually impregnable. This technique will eliminate the problem of fishtailing, it will prevent joint flexing under excess pressure, and most importantly, it will ensure the joint provides a seamless cutting edge for the entire production run.

