# Armor

## Dieflex Platinum...

## ...the high performance cutting rule

ARMOR STEEL

# Armor

## Dieflex Platinum...


## Hard edge...

Dieflex Platinum has an extremely hard cutting edge (4000 - 5000HV), which

is far in excess of all previously available products. It is twice as hard as the current hardest product available - titanium nitride coated rules.

## Smooth coating...

The thin surface coating to the cutting bevel ensures there is no rounding of the edges.
The extremely low coefficient of friction of the special coating results in reduced cutting pressures and dusting.

# ...a world class winner

## Very good bendability...

Dieflex Platinum is based on the proven Dieflex family of cutting rules. The unique microstructure of these rules ensures consistency, repeatability and extreme bendability.
The special application technique ensures a very thin and even layer of coating. Even with the tightest of bends the surface coating will not flake.

## Excellent for long runs...

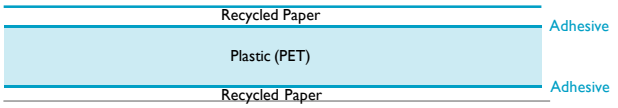
Armor Dieflex Platinum cuts tougher materials at a lower cutting pressure with improved release properties.
This reduces dusting problems and at the same time gives excellent and even cutting results on long runs such as fine boards for cigarette and pharmaceutical packs.

# check out the perfomance...

Armor is one of the largest worldwide producer of the quality flat-bed cutting rules, with a product programme designed to meet the needs of the world's diemakers.

To ensure that every new product meets the customers' requirements, they are tested extensively on a dedicated, laboratory scale Autoplaten machine which has the facility to control individual parameters thereby enabling accurate comparable product tests to be undertaken.

For the purpose of this particular series of tests an aggressive substrate was chosen enabling the selected products to be pushed to their limits. The substrate was a triple layer composite with PET in the centre and a layer of recycled paper stuck to each side.




The objective of the tests was to understand and prove the performance of Dieflex Platinum rule against a standard cutting rule and, perhaps its closest competitor, a Titanium Nitride coated cutting rule which was the hardest rule available before Platinum was launched. All three rules used for the tests were 2 point 23.80mm, the most common specification.

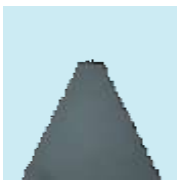
The following parameters were compared during the trials:

## Edge Profile

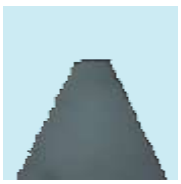
During continual use any cutting rule's edge profile starts to wear away or become blunt.

Test results recorded two different views having subjected the three rules to exactly the same die design, make ready, pressure, speed and a run of 180,000 cuts.

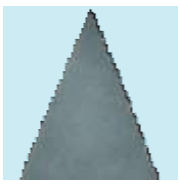
The edge profile images below are self-explanatory – Dieflex Platinum maintained its edge profile which gives the benefits of improved quality of finished cartons, increased die life and hence a reduction of overall die costs.



Standard



Titanium Nitride Coated



**Dieflex Platinum**

Now check out the cutting edge...

Standard

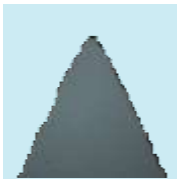
Titanium Nitride Coated

**Dieflex Platinum**

## Edge Radius

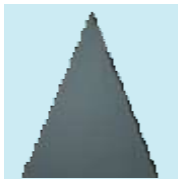
The edge sharpness of a cutting rule is measured by checking the radius of the cutting tip – it is the condition of this tip that ensures the early penetration of the substrate.

Looking at the images below, it can be seen that Dieflex Platinum has a far sharper edge radius (0.8 microns) compared with the other two rules.



Standard

Titanium Nitride Coated



**Dieflex Platinum**

## Cutting pressure

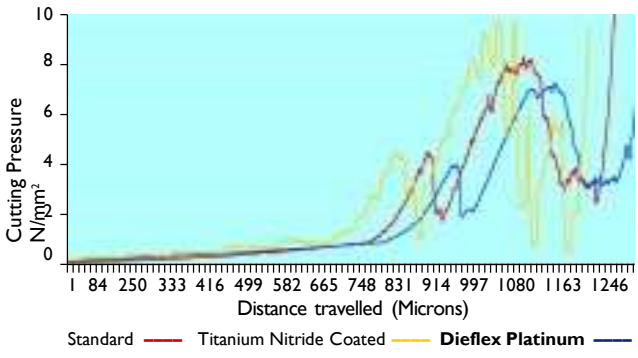
The lower the cutting pressure or force required for the rule to cut through the substrate the better – the benefits are increased die life and reduced machine wear and maintenance costs.

Edge angle and the surface roughness of the bevel influence the required cutting pressure - as a rule starts to wear it requires more force to cut through the substrate.

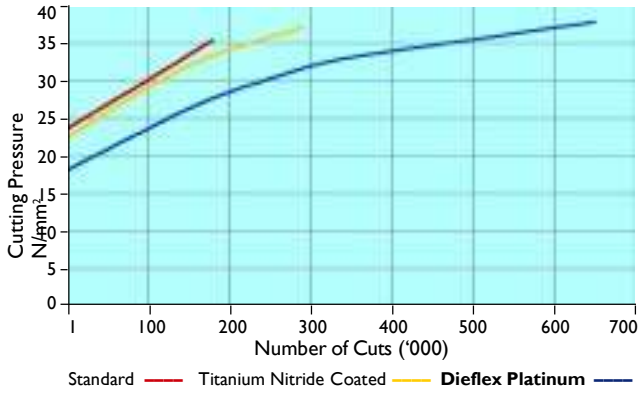
Keeping all parameters constant, the graph below plots the cutting pressure required up to 180,000 cuts. The unique smooth coating of the Platinum bevel gives an immediate advantage – the cutting pressure is 15% lower than the alternatives even when new. The difference is even more pronounced as the rules wear.

The second graph, on the opposite page, indicates the development of the cutting pressure through the lifetime of the rules.

### Test Substrate Cutting Pressure with New Rules



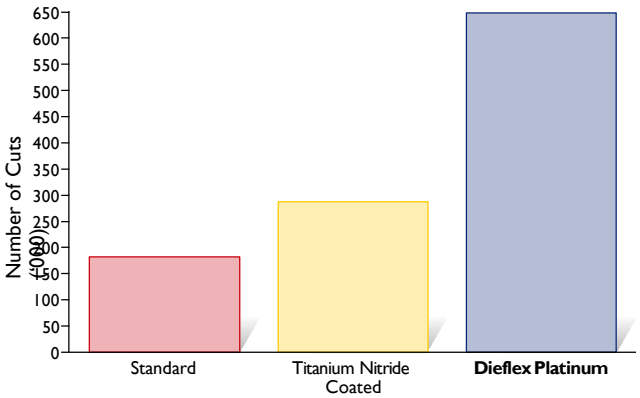
## Lifetime Cutting Pressure




# Cutting Life

Cutting life is defined as the longevity of a cutting rule measured by the number of cuts achieved before the rule becomes completely blunt.

The test parameters for the three new rules were constant. It is obvious that the 4000 – 5000 HV hardness of Platinum had a dramatic impact in this test, even when compared with the 2000HV of the Titanium Nitride coated rule. The benefits of the increased life of Platinum are a reduction in the overall cost of the die and increased productivity due to fewer die changes.




# Dusting

With the increased use of recycled board, converters are experiencing an increase in dusting or slivers – these are small substrate fibres that break off during cutting and can contaminate the machinery, packaging and end product. This problem can be particularly catastrophic with food and pharmaceutical packaging.

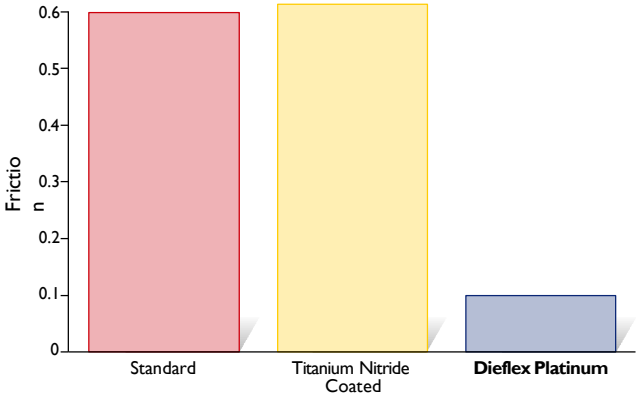
Dusting is caused when cutting – this is an explosive process where the substrate is pinched and compressed by the cutting rule to such an extent that it bursts apart.

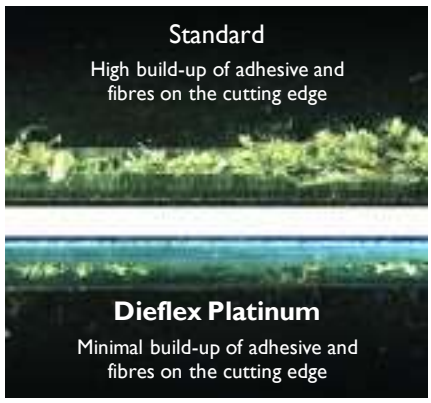
The key to reducing dusting is to achieve a reduction in the bursting through the early penetration of the cutting rule edge/tip into the substrate with minimum compression.

The second cause of dusting is rough bevels on the cutting rule, these pull out the fibres of the substrate and adhesive when they brush past the recycled paper on the return stroke.

The chart below indicates clearly the relative friction coefficient of the three rules. The images of the side profiles show the dusting and adhesive retained on the cutting edge of a standard rule and Dieflex Platinum after 180,000 cuts and the sample substrates show the clean cut of Platinum compared with obvious pull out damage of the Titanium Nitride coated rule after 180,000 cuts.

## Friction Coefficient of the three cutting edges




Titanium Nitride Coated | **Dieflex Platinum**

The hardness, sharp cutting edge and smooth bevels of Dieflex Platinum keeps downtime to a minimum due to the greatly decreased dusting.The quality of the finished product is improved and the costs of machine cleaning and maintenance are reduced.

# ...and some interesting applications

## North American Converter

A leading designer, printer and packaging producer with their own in-house diemaking facility.
The plant has run some impressive trials with Dieflex Platinum, DC-23.80-2-42-C-PT.
A Platinum dieboard achieved over 2.4 million cuts on a 0.45mm thick recycled board treated with a wax layer to protect the board which is used for drinks packaging. The most difficult of substrates to cut particularly on demanding long runs – raise a glass to Dieflex Platinum the overall winner.


## A Packaging Company in China

One of the largest paper packaging printers and manufacturers and corrugated carton producers in China, has undertaken trials using Armor Dieflex Platinum cutting rule on a board used for toothpaste packaging.
The board is PET laminated (16µ thick) on a 0.54mm thick 400gsm recycled board. The PET lamination is also overprinted in full colour with a final clear UV varnish giving a final board thickness of 0.55 – 0.58mm.
Previous standard cutting rules achieved runs of just over 100,000. Armor Dieflex Platinum recorded a final run of 770,000 – proof indeed of the exceptional cutting qualities of this rule.

## United Kingdom Product Presentation Specialists

A major UK company that specialises in designing and manufacturing high quality packaging for many leading brand manufacturers.
A particularly challenging substrate – a PE coated board and a high standard cutting rule dieboard has only been achieving a single run of 40,000.
Dieflex Platinum has been trialled on the same substrate and has achieved six runs of 40,000. It also gave a cleaner cut and ran at faster speeds than the original high standard rule.

## STOP PRESS

**Major fine carton manufacturer hits over 3 million!**
A major manufacturer of fine cartons in China has just achieved a run of 3.3 million using Dieflex Platinum cutting rule ...and the dieboard is still going strong!

## Check out the benefits of Armor Dieflex Platinum

- Increased life of dies
- Improved quality of finished products
- Reduced production costs
  - lower die costs
  - improved productivity
  - reduced downtime
  - reduced cleandown time
- Reduced long term costs of machinery wear and tear

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