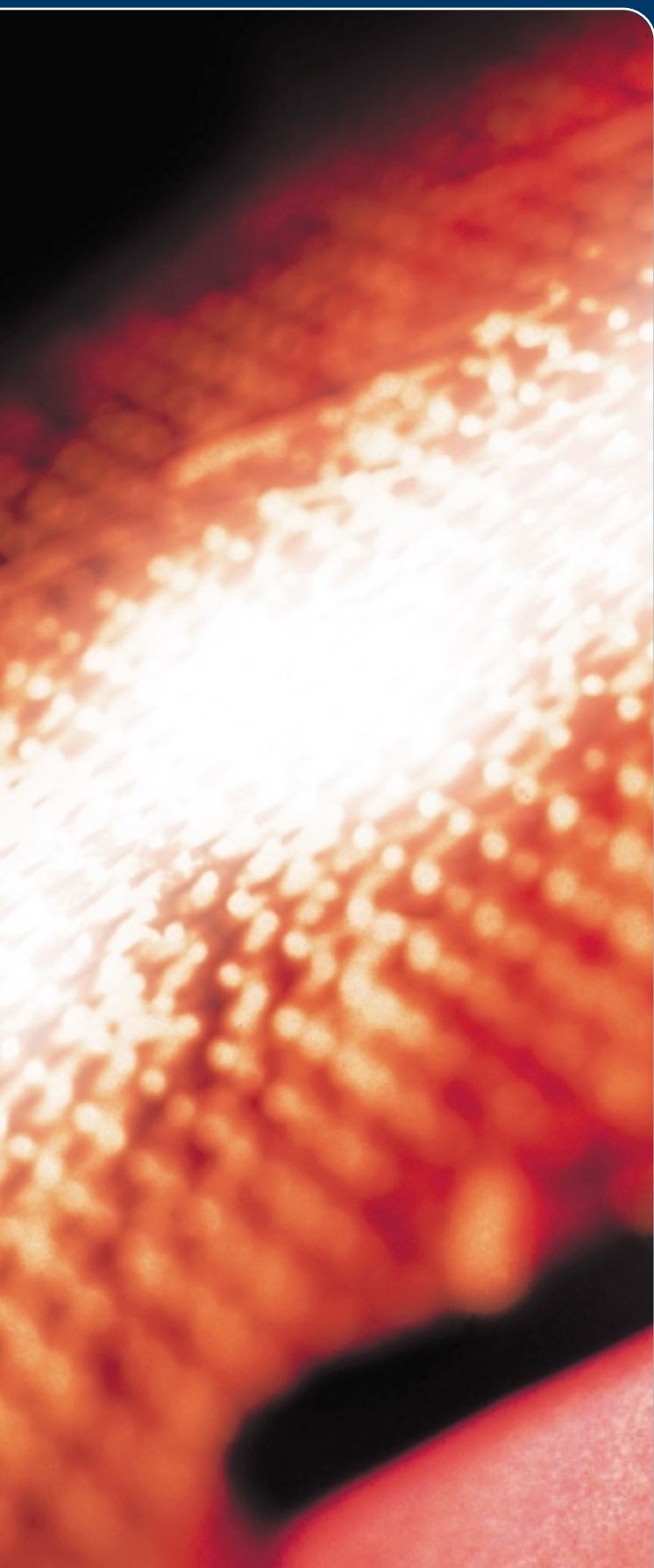


# Ecoflex Substrate Support System Value Differentiators



## Ecoflex - our mission

Our mission as an automotive supplier is to deliver world class innovative products that help our customers grow sales and improve profitability and at the same time make a major contribution to improving the environment.



## What is Ecoflex?

- Substrate Support System used in catalytic converters
- Organically bound mat
- Manufactured using Saffil alumina fibres (Ecoflex 200) M-Fil fibres (Ecoflex 200M).

## Technology Drivers

- High Temperature Applications (close coupled catalysts)
- Low Temperature Applications (Diesel Oxidation Converters)
- Diesel Particulate Filters
- Thin & Ultra Thin Wall Substrates.



## Design Criteria

- Engineered to give 10 year /100,000 mile durability
- Temperature Durable 200°C to 1050°C
- Use non-carcinogenic materials.

## Ecoflex Substrate Support Systems

The systematic reduction in ceramic substrate cell wall thickness from 6mil to thin (4mil) and ultra thin wall (2-3mil) results in a much more fragile structure which, together with increased vibration so close to the engine, makes selection of the substrate support system critically important. Exhaust systems in Japan are moving to the ultra thin-walled substrates with the trend following in Europe and the USA.

The main purpose of the substrate support system is to maintain a positive pressure between the ceramic substrate and the metal shell, accommodating the affects of thermal expansion and engineering tolerances which change the gap, hence holding pressure during engine operation.

Ecoflex Series products have been developed to meet the constantly changing technical and cost targets of the automotive industry.

Designed for diesel and gasoline catalysts....

- ❖ Outstanding durability
- ❖ Stable to 1200°C
- ❖ Excellent gas erosion resistance
- ❖ Low thermal conductivity
- ❖ Recycling potential
- for all types of ceramic substrate
- ❖ Thin Wall (4mil) & Ultra Thin Wall (2-3mil)
- for all canning & soft canning systems
- ❖ Stuffing
- ❖ Tourniquet
- ❖ Clamshell
- with easy handling characteristics
- ❖ Flexible & lightweight
- ❖ Non-dusty
- ❖ Die cut to tight tolerances
- ❖ No special handling or disposal needs

## Advantages of Ecoflex Substrate Support Systems over competitive Soft Canning Products

Ecoflex®	C2	C3	C4	C5
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### Technical Advantage

<b>High Temperature Durability</b> Superior Performance at 1000°C	✓			✓	
<b>Low Thermal Conductivity</b> 40-60°C Lower Shell Temperatures	✓			✓	✓
<b>Low Gas Permeability</b> Increased converter gas flow	✓			✓	✓
<b>Low Boardiness</b> Performance at diesel temperatures	✓	✓	✓	✓	

### Performance Advantage

<b>Proven Track Record</b> Over 20M Converters supported	✓		✓	✓	
<b>Vertical Integration</b> Added Value through Supply Chain	✓				✓

## Advantages of Ecoflex Substrate Support Systems over Intumescent Mat Products

Ecoflex Property Advantage	Application Impact	Cost Impact
No loss of performance at highest exhaust temperatures (850 - 1100°C)	High durability in close coupled catalyst	Avoids the need to change from ceramic to more expensive metal substrate
Greater gas erosion resistance	No risk of gas by-passing or substrate slippage	Reduced warranty costs and no need for costly edge seal protection
Lower thermal conductivity	40-60°C lower shell temperature	Reduced heat shielding costs
Constant pressure over wide temperature range	Suitable for use in gasoline and diesel systems	Avoids thermal pre-treatment costs in diesels
Lower pressures on the substrate	Can be used with thin and ultra thin-walled substrates	No risk of substrate cracking/failure and associated costs



# Keeping World Class Companies Supplied

Saffil supplies over 10 million parts annually to the automotive industry



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Detroit  
Michigan USA

## Europe

### Saffil Limited

Widnes  
Cheshire UK

### Saffil Automotive

Hollywell  
Flintshire UK

## Africa

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South Africa

## Asia

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