



# PAD PRINTING SUPPLIES CATALOGUE

- PAD PRINTING INKS
- AUXILIARY AGENTS
- SOLVENTS
- PADS
- PRINTING PLATES
- MACHINERY
- SPARE PARTS
- SUBSTRATE TESTING

*Ask the experts!*

[www.handel.com.au](http://www.handel.com.au)

HANDEL  
& SONS PTY LTD  
SYDNEY 02 9568 3322  
MELBOURNE 03 9544 2433

Handel & Sons Pty Ltd was founded in 1983 to specifically concentrate on pad printing, a technology unknown in Australia at the time.

Representing the full range of pad printers from leading Swiss manufacturer Teca-Print, as well as the comprehensive ink range from the pioneer of pad printing inks, Coates Screen, now part of SunChemical, Handel & Sons quickly satisfied a lively need for pad printing machines and consumables in numerous industries throughout Australia.



Competence in the related graphics and platemaking areas as well as the in-house expertise residing in our small printroom allows new and existing customers to solve innumerable printing tasks, often the fruit of a joint effort.

Operator training, after sales service and a wide range of stock in inks, plates, pads and other essential consumables are all part of the support we offer the industry.

We trust you will find this catalogue not only a valuable source of information in relation to what is available but also a document you can turn to for answers to many of your technical questions.



**H**andel & Sons Pty Ltd has for many years supported the pad printing industry with a complete line of ink formulations for an extensive range of print applications in the industrial and promotional products industry. Our range of inks is so versatile that almost any material can be successfully decorated. They have even been used successfully in spraying and dry-offset applications.

Our technical staff have many years of experience in print and ink testing for compatibility with all manner of substrates. They can also provide advice and training in all aspects of pad printing and ink mixing.

### *Features of the Handel & Sons range of ink products and services.*

- A large selection of ink types available from stock.
- Non-toxic pigments.
- Available in solvent-based and ultraviolet (UV) curing formulations.
- A range of screen printing inks is also stocked.
- Using our colour spectrophotometer, our ink-mixing department is able to match colour samples provided by you. Pantone® colours can also be mixed to order.
- A special ink-mixing system, the C-Mix 2000 Colour Matching System, is available to provide an easy to use, consistent method for producing over 350 standard colour variations which are documented in the C-Mix colour fan available from Handel & Sons. We can mix these colours for you or you can carry just twelve basic colours in each ink type and mix your own, thus obviating the need to carry a large inventory of individual colours.
- Daylight fluorescent colours available.
- A comprehensive range of ink additives.
- Polyolefin surface tension testing and pre-treatment service.
- Print test / ink adhesion service.
- PMS recipes available for your own use.



This page provides a brief description of the ink types currently available from Handel & Sons. Please check the substrate compatibility chart for the most appropriate ink for your application, and the colour selector guide for stock availability. Please contact us for a complete Product Data Sheet of the ink type in which you are interested. Remember, materials are often broadly classified by manufacturers so pre-production print testing is always advisable.

**TP 212-NT** - an oven curing pad printing ink which shows gloss, good opacity and weather resistance.

**TP 218-NT** - is quick drying, glossy and opaque. It shows high mechanical resistance and resistance against many organic solvents, chemicals, diluted alkalies and acids, oils and grease. Mechanical and chemical resistances are not achieved until the ink is fully cured (approx 5-6 days).

**TP 218/GL-NT** - can be processed as 1- or 2-component inks. It has a semi-gloss finish of good opacity. It shows high mechanical resistance and resistance to many organic solvents, chemicals, thinners alkaline and acids, water, oils and grease. Resistance depends on type of hardener and drying method used.

**TP 233-NT** - this single component ink shows good opacity, overprintability and gloss. At room temperature it is completely cured in 30 minutes.

**TP 247-NT** - a quick drying, semi-gloss ink which shows good opacity and weather resistance. It can be processed as a 1- or 2-component ink. As a 2-component ink it shows resistance to various solvents. Mechanical and chemical resistances are not achieved until the ink is fully cured (approx. 5-6 days).

**TP 249-NT** - quick drying, glossy and shows good opacity. Shows good resistance against cosmetics (creams and oils), dishwashing liquid and hand sweat.

**TP 253-NT** - quick drying with a semi-gloss finish. It is elastic and shows considerable forming resistance. For technical reasons it has only medium opacity.

**TP 260-NT** - this ink is quick drying with a glossy finish. It shows resistance to many organic solvents, chemicals, diluted alkalies and acids. Compared to TP 218 resistance to mechanical abrasion is much better. Mechanical and chemical resistances are not achieved until the ink is fully cured (approx. 5-6 days).

**TP 272-NT** - quick drying showing good opacity and a semi-gloss to glossy finish. The print is very resistant to mechanical abrasion. It is weather resistant and relatively alcohol resistant.

**TP 273-NT** - a quick drying semi-gloss ink. The ink film is elastic and largely deflects with the contours of the substrate. It has medium opacity.

**TP 282-NT** - this ink is quick drying, has a good opacity and a glossy finish. At room temperature it is cured after approximately 10 minutes.

**TP 287-NT** - this is a quick drying, semi-gloss ink. It has good opacity, weather resistance and resistance to mechanical abrasion.

**TP 300-NT** - a quick drying and glossy ink. Suitable for a wide range of substrates. Opacity and printability are very good. This ink is suitable for rotary printing. It is fully cured in approximately 24 hours. Can be processed as a 1- or 2-component ink

**TP 305-NT** - this 1- or 2-component ink is quick drying, shows excellent processability and has good gloss and adhesion characteristics. Used as a 2-component ink, complete curing is achieved after approximately 5-6 days.

**TP 311-NT** - very quick drying and weather resistant. It has good processing properties, high gloss and good resistance against fuels and alcohol especially when processed with hardener TP 219/N

**TPI-NT** - quick drying with a semi-gloss finish. Due to its high pigmentation it shows very good opacity. TPI-NT also shows excellent resistance to alcoholic cleaning agents and hand sweat.

**TP/PP-NT** - for printing onto untreated polypropylene. Due to various degrees of polymerisation as well as contents and fillers the substrate polypropylene has an undefined printability. It is therefore essential that printing tests are conducted before committing to using this ink. Drying time is approximately 10-15 minutes.

**TP/UV-K** - for printing on a wide range of materials this UV-curing pad printing ink has good opacity, high gloss, very good transfer properties from pad to substrate and a shadow free print with good contour sharpness

**TP/UV-R** - for printing on a wide range of plastics this UV-curing pad printing ink has an excellent printability even if the plate is deeply etched and printing speed is very high

**TP/UV-P** - a UV-curing pad printing ink especially developed for ABS materials.

Please call us if you would like a colour chart or need assistance in determining the most suitable ink for your application

## SUBSTRATE COMPATIBILITY INK SELECTOR GUIDE

Substrate	TP 212-NT Ov.cur 20 min/ 140C	TP218-NT + TP219 4:1 *	TP218/ GL-NT + TP219/ GL 20:1 *	TP233-NT air drying	TP247-NT + TP219 10:1 **	TP249-NT Air drying	TP253-NT + TP219 10:1 **	TP260-NT + TP219 2:1 *	TP267-NT +TP219 or TP219 N/00 8:1 *	TP272-NT Air drying	TP273-NT + TP219 10:1 **	TP282-NT Air drying	TP287-NT Air drying	TP300-NT + TP219 10:1 **	TP305-NT + TP219 10:1 **	TP311-NT + TP219/ N 10:1 **	TP1-NT Air drying	TP/PP-NT air drying
Duroplastics	•	•	•	•				•	•					•*				
Glass			•	•								•						
Rubber							•				•*			•*				
Wood				•						•				•	•			
Coated surfaces	•	•		•	•			•	•	•		•	•	•	•	•	•	•
Leather, Synthetic leather		•					•				•*						•	
Metals	•	•	•					•	•					•	•			
Paper, cardboard				•								•	•	•	•			
Polyamide		•			•			•	•			•		•*				
Polyacetal (post treatment required)		•							•					•*				
Polypropylene, Polyethylene (pre-treated)		•			•*			•	•			•		•	•*			•
Polypropylene (untreated)																		•
Polycarbonate				•		•		•		•			•	•		•	•	
Polyester Polyester (pre-treated)		•		•				•	•			•		•				
Polymethylmethacrylate		•		•	•	•		•	•	•			•	•		•	•	
Polystyrene, ABS, SAN						•		•	•	•			•	•		•	•	
Polyurethane		•		•	•		•	•	•		•			•				
PVC rigid				•	•	•		•	•	•	•		•	•	•	•	•	
PVC plasticized					•					•			•			•	•	
Textiles							•				•							

This chart is meant as a guide to suitable inks for selected substrates. There is no guarantee given or implied. It is essential that pre-testing is done to determine the suitability of the ink selected

\* = 2-component ink    \*\* = 1- or 2- component ink

*for all your pad-printing needs*

**Handel & Sons Pty Ltd**  
**Melbourne: 03 9544 2433 Sydney 02 9568 3322**  
**Freecall: 1800 998 998**

**www.handel.com.au**

## PAD PRINTING INK COLOUR AVAILABILITY GUIDE

#	Standard Colours		HG	TP 218	TP 218GL	TP260	TP273	TP287	TP300	TPI	Z
	Colour	Ink Type									
10	Citric yellow			•	•		•	•	•	•	
11	Medium yellow			•	•		•	•	•	•	
12	Dark yellow			•	•		•	•	•	•	
15	Orange			•			•	•	•		
17	Ochre yellow										
20	Light red			•	•		•	•	•	•	
21	Bright red			•	•		•	•	•	•	
22	Carmine red			•					•	•	
25	Pink										
30	Light blue			•	•		•	•	•		
31	Medium blue			•	•		•	•	•		
32	Ultra blue			•	•		•	•	•	•	
33	Dark blue			•			•	•	•	•	
34	Turquoise								•		
37	Violet			•	•				•	•	
40	Light green			•	•		•	•	•	•	
41	Fir green			•				•	•	•	
42	Brilliant green							•	•		
50	Light brown								•		
51	Dark brown								•		
60	White		•	•	•	•	•	•	•	•	•
60 HD	White – high density								•		
65	Black		•	•	•	•	•	•	•	•	•
180	Europe yellow			•	•		•	•	•	•	
181	Europe magenta			•	•		•	•	•	•	
182	Europe cyan			•	•		•	•	•	•	
75	Gold			•	•			•	•	•	
79	Silver			•	•			•	•	•	
	<b>Mixing shades</b>										
Y30	Citric yellow			•	•			•	•	•	
Y50	Golden yellow			•	•			•	•		
O50	Orange			•	•			•	•		
R20	Scarlet			•	•			•	•		
R50	Red			•	•			•	•		
V50	Violet			•	•			•	•		
M50	Magenta			•	•			•	•		
B50	Blue			•	•			•	•		
G50	Green			•	•			•	•	•	
N50	Black			•	•			•	•	•	
W50	White			•	•			•	•	•	
E50	Varnish							•	•		
B	Binder			•	•			•	•	•	

Where standard colours are not shown against a particular ink type they can be mixed by Handel & Sons if a full range of mixing shades is indicated. Please call for a colour chart.

## Thinner

Thinners are used to adjust the ink to a ready-to-print consistency. The amount of thinner used depends on ink type, printing speed, environmental conditions, plate depth and the like.

- **Code: Thinner A** - A universal thinner for pad printing inks. Due to its balanced mixture of solvents this product is the first choice for all “regular” pad printing applications. This is suitable for use with all inks in the Coates range.
- **Code: Thinner CF** - A thinner very similar to Thinner A but containing no cyclohexanone, making it a more “user-friendly” product. This is suitable for use with all inks in the Coates range.
- **Code: Thinner B** - This universal thinner is suitable for quicker printing speeds or cooler, more humid conditions. This is suitable for use with all inks in the Coates range.



- **Code: BGA** - This thinner is suitable for slower printing speeds. This is suitable for use with all inks in the Coates range.
- **Code: CAN** - This is an “aggressive” thinner which may improve adhesion of pad printing inks on soluble substrates. There will be no improvement of adhesion on non-soluble plastics e.g. polyolefins, PP, PE. This is suitable for use with all inks in the Coates range.
- **Code: TP 262** - This is a mild special thinner for sensitive substrates. In combination with ink type TP249 it is especially suitable for printing onto plastics with a tendency to tension cracks e.g. polystyrene. TP 262 is not suitable for 2-component pad printing inks. Also useful as a cleaning agent for faulty prints. If a retarder is required use TPV.

## Hardener

Hardeners react chemically with suitable ink systems. This reaction is initiated as soon as the hardener is mixed with the ink. Therefore 2-component systems consisting of ink and hardener can only be used for a limited period of time (pot life). Even if the mixed ink still seems to be processable after this time it should be replaced with new ink in order to guarantee adhesion and resistance values to correspond to your requirements.

Complete curing of ink with hardener can take up to 6 days. Even though ink film seems to be dry a short time after evaporation of solvents (physical drying) the chemical cross linking process still continues. This chemical reaction requires the minimum temperatures as described in the following.

Abrasion resistance and cross hatch adhesion tests should not be checked prior to completion of the cross linking process.

- **Code: TP 219** - Cross linking component for ranges TP 218, TP 247, TP 253, TP 260, TP 267, TP 273, TP300, TP 305, TP 307 and TP 311. Reacts at temperatures starting from 10°C. This product has a slight tendency to yellowing, therefore it should not be used for outdoor applications.

- **Code: TP 219N** - Cross linking component for ranges TP 247, TP 253, TP 273, TP300, TP 307 and TP 311. Curing temperatures above 20°C. Does not tend to yellow and is suitable for outdoor applications.



- **Code: TP 219N-00** - Cross linking component for ranges TP 267, and TP 305. Curing temperatures above 20°C. Does not tend to yellow and is suitable for outdoor applications.

- **Code: TP 219/GL** - Cross linking component for ink TP 218/GL. Suitable for air and oven curing. Cured prints show good water resistance and relatively good chemical resistance.

- **Code: TP 219/GL-02** - Cross linking component for ink TP 218/GL. Suitable for air and oven curing. Prints show very good chemical resistance, especially if cured at higher temperatures

- **Code: TP 219 ON** - This is especially recommended when heat curing is used. The minimum curing time is 20-30 minutes at 140°C. The pot life of ink mixed with this hardener is several months. TP 219-ON can be mixed with the following pad printing inks - TP 218, TP 247, TP 260, TP 267, TP 305 and TP 307.



### Adhesion promoter

A binder component which improves ink adhesion on polypropylene materials. It can be added to TP300 in order to print onto non-pretreated polypropylene (pre-testing is absolutely necessary). This product is added directly to the ink. For an adhesion promoter or primer which is applied to the PP substrate refer to the section titled "Primer".

- **Code: FX209**



### Flow agents

Problems which can occur on the surface of printing ink are bubbles, pin holes, voids, orange peel or similar effects. In order to avoid such undesired effects additives called flow agents can be added to the ink. Addition should be carried out carefully and the amount specified should not be exceeded. It is very important to stir the flow agent into the ink vigorously to ensure a homogeneous dispersion.

- **Code: VM1** - A silicone containing flow agent for a broad field of applications. It is suitable for all ink types. Addition is at the rate of 1-5% and it is not over-printable. Testing is recommended.

- **Code: VM2** - The effect of VM2 is basically the same as VM1 but it is more concentrated and therefore more effective. Addition should not exceed 0.3%-0.5%. Only in exceptional cases can up to 2% VM2 be added. This flow agent is not overprintable. Testing is recommended.

- **Code: VM3** - It is only suitable to use VM3 if no other silicone containing flow agents have already been mixed into the ink. VM3 is preferably used for overprinting applications. This flow agent has shown excellent results as an additive for 2-component inks. Addition at the rate of 1-5% is recommended. A higher dosage is not suitable and will not achieve any improvement



### Print remover

- **Code: TP 262** - This is a mild special thinner for sensitive substrates which can be used as a cleaning agent for faulty prints.



### Primer

This product was especially developed for virgin polypropylene. If adhesion promoter PP is used pre-treatment such as flame or corona is unnecessary. Pretests are required for other plastics and metals. PP may be applied by spraying, dipping or brushing. However, the layer applied should be thin as otherwise it will lose its effectiveness. Substrates treated with adhesive agent PP may be coated, printed, glued or metallized one minute after application or after a few months.

- **Code: P.P. Primer**



### Anti-static paste

Static charge generated during the printing process can have a negative effect on the printed image. When printing fine lines the contours of the print develop web-type or hair-line traces which have an adverse effect on the printed image.

The cause of static charge is mainly due to the climate conditions in the print shop. Low humidity will increase the tendency to electric charge and therefore also increase the negative influence on the printed image.

Increasing room humidity, running the ink at a thinner viscosity, slowing the pad up-stroke or using a steeper pad will all assist in reducing this problem.

When printing nonpolar plastics such as polyolefins (eg polyethylene) the substrate will show extreme static charge in unfavourable environmental conditions.

The addition of 3-5% of antistatic paste can solve your static problems in many instances.

- **Code: LAB-N 111420**

### Retarders

Retarders are auxiliary agents which slow down drying. They reduce the evaporation rate of the solvents contained in the ink. Retarders not only delay the drying of the ink in the plate and on the pad, they also retard the ink drying on the substrate. Always try using slower thinners first before using retarders. As always, testing is recommended.

Addition of liquid retarder will reduce viscosity to a large extent and may have a negative effect on the contour sharpness of the image. Using a retarder paste which does not influence the viscosity may result in high contour sharpness of finest details. Add retarder paste at the rate of approximately 5-10%.

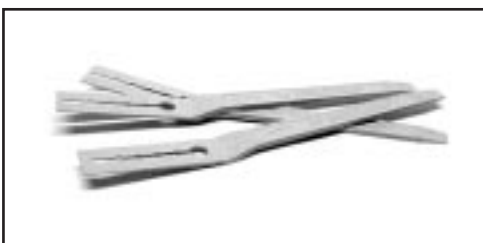
- **Code: TPD** - Universal retarder with high solubility and strong retarding effect.

- **Code: TPV** - Retarder with low solubility and strong retardation. In conjunction with ink TP249 it can be used for printing onto plastics with a tendency to tension cracks. Not suitable for 2-component inks except TP218/GL.

- **Code: SUPER RETARDER** - Suitable for applications requiring slower drying or "tacking-off", or under extremely high ambient temperature conditions.

- **Code: LAB-N 111420/VP** - Retarder paste, contrary to liquid retarders does not thin the ink but still shows a retardation effect.





### Mixing cups

Quality cups for mixing ink in preparation for printing. Choose from paper, capacity 240ml, or polypropylene 150 ml. The smaller cup is ideal for mixing up to 100 grams of ink and is very stable.

- Code: **MIXING CUPS (250ml)** (pack of 50)
- Code: **P/MIXING CUPS (100ml)** (pack of 50)

### Mixing sticks

Economical flat wooden blades for stirring and mixing ink. (Packet of 50)

- Code: **MIXING STICKS**

### Test (Dyne) pen

Use this inexpensive item to determine the adhesion properties of polyolefins e.g. polypropylene, polyethylene. Shows if the material's surface tension is above 38mN/m or not and therefore indicates if pre-treatment is required. Pens of other test levels, and test inks, are also available for more critical applications

See the Technical Section of this catalogue for more details on this topic.

- Code: **900925**

### Test Inks

For a more accurate determination of surface tension use this range of test inks. Kit contains 7 x 10ml bottles 28/35/38/41/44/48/56 mN/m

See the Technical Section of this catalogue for more details on this topic.

- Code: **40 30001 0**

### Viscospatula

Inks are supplied ready for printing but they must be conditioned with thinner to ensure the appropriate processing viscosity. The Viscospatula has been developed to enable the measurement of viscosity during the mixing of the ink, thinner and other additives. Simple to use, it takes the guesswork out of achieving the correct viscosity for your print job.

- Code: **900901**



### Hardener bottle

Ideal for storing hardener at your ink mixing station. Allows for easy addition to ink and has a snap-top to ensure proper sealing immediately after use. Always wipe the opening to a hardener container as any excess liquid will harden in the air and make sealing difficult.

- Code: Plastic Bottles



### Thinner bottle

250ml squeeze bottle for thinners, TP262, methylated spirits etc. at the printing station. Simplifies addition of thinner to inkwells during work-in-progress.

- Code: Bottle (SIE1633)



### URS Washup solvent

Best for cleaning inkwells, plates, sealed ink cups and removing dried ink.

- Code: PLATE WASH
- Code: PLATE WASH RM (for Teca-Print WG700 wash-up unit).

Available in 1l, 2l, and 5l cans or 20l drums with or without bung.



### Screen spray

For opening up screens on which the ink has dried - for example, due to high temperature or an interruption in the screen printing job. Also available in 500ml pressure packs.

- Code: SOL. SCREEN SPRAY
- Code: SCREEN SPRAY LITHOGRAPH (Pressure pack)



### Doctor blade polishing cloth

Keep a good edge on your doctor blade and avoid scratching your plates by giving it a polish at the start of each shift.

- Code: 990111



### Jumbo towel roll

Ideal for cleaning ink from printed parts and for general cleanup around your printing machines. Made in Australia. 250mm wide x 700m long.

- Code: 4181



### Double sided tape

37mm wide x 3.0m long with adhesive on both sides.

Excellent for attaching spacer blocks to pad bases, ink separators to plates and short-run fixtures to your printing machine work table. This stuff sticks!

- Code: DS Tape



### Clear tape

48mm wide x 75m long

Ideal for removing dried ink, dust and other contaminants from the face of your printing pads.

- Code: Clear Tape



### Silicone Oil

Treating your pads with this oil can promote longevity and optimise pad performance by replacing oil lost during normal pad use. Refer to the pad selection section of this catalogue for recommendations on pad maintenance.

- Code: Siliconoil ( specify 500ml or 1l ).



### Doctor blade

Available in any continuous length or cut to size. Three sizes available.

- 19mm x 0.25mm ● Code: 58202.0001
- 40mm x 0.25mm ● Code: 58202.0002
- 40mm x 0.38mm ● Code: 58202.0003



### Disposable Gloves

These inexpensive polyethylene gloves are very easy to slip on. They facilitate adherence to work instructions requiring the use of skin protection. (while handling thinners and ink etc)

- Code: 03565



### Cotton Gloves

Cool, comfortable and inexpensive, this glove is ideal for sweat absorption. Prevents human contact with printing surfaces which can negatively influence ink adhesion.

- Code: 160134 (Men's)
- Code: 160163 (Women's)



### Rubber Gloves

Super Nitrile gloves offer dexterity and protection against abrasion. They are resistant to certain chemicals and are recommended for use when handling solvents. (Not for wash-up use)

- Code: S.E.SOLGLOVE L - Large
- Code: S.E.SOLGLOVE M - Medium
- Code: S.E.SOLGLOVE S - Small



### Hand Cleaner

Extra heavy duty hand cleaner for all types of "hard to remove" industrial soils. Will quickly and easily remove soils such as ink, paint, grease, dyes and oil. Contains lanolin and emollients to provide skin moisturising properties. Has been formulated from soaps, surfactants and mild solvents. Contains high quality fine pumice to provide a scrubbing action needed to remove difficult soils from skin crevices.

- Code: HANDCL



### Magnifying glass

Spot print problems before your customer does!

25mm diameter double lens. Black, triple fold frame 6x, with 25mm scale on base.

- Code: 261-5009



### Exposure Units

Enjoy the flexibility and economies of making your own printing plates. Australian made. Complete with integrated vacuum, timer and quality light source. Four sizes available. If you are new to pad-printing our staff will train you in the use of these units.

- **Code: UV160350** (Vacuum bed size 160mm x 350mm)
- **Code: UV160500** (Vacuum bed size 160mm x 500mm)
- **Code: UV240690** (Vacuum bed size 240mm x 690mm)
- **Code: UV380800** (Vacuum bed size 380mm x 800mm)



### Developing Trays

Configured with magnetic base liner to hold the plate while it is being developed using the plush cloth and rubber.

- **Code: 900130** 300mm x 200mm with magnetic foil
- **Code: 900131** 700mm x 220mm with magnetic foil



### Plush cloth rubber and cloth

Used for brushing of plate surface when developing alcohol wash plates.

- Plush cloth rubber** ● **Code: 900110**
- Plush cloth** ● **Code: 900111**



### Screen film

- **Code: 900021** 200 LPI, 80% (130mm x 180mm)
- **Code: 900022** 200 LPI, 80% (160mm x 600mm)
- **Code: 900023** 300 LPI, 80% (130mm x 180mm)
- **Code: 900024** 300 LPI, 80% (160mm x 600mm)



### Spray bottle

Facilitates the application of developer when processing alcohol wash polymer plate.

- **Code: 900906**



### Polymer plate

This high quality polymer plate is available in water washout and alcohol washout types. It can be ordered with or without registration holes. Plates can be cut to any size required. If desired, plates can also be supplied etched with your required image. With proper care these plates can be expected to last as follows:

Water washout - 10,000 prints, Alcohol washout 12,000.

● **Code: Specify type, size and if registration holes are required**

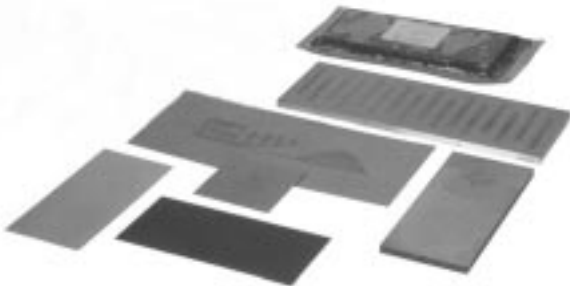
### Long Life Polymer Plate



This high quality polymer plate is a water washout type. It can be ordered with or without registration holes. Plates can be cut to any size required. If desired, plates can also be supplied etched with your required image. With proper care these plates can be expected to last 50,000 prints.

● **Code: Specify type, size and if registration holes are required.**

### Steel plate



High grade hardened steel plates are available in 0.5mm, 1mm and 10mm thicknesses. These are normally supplied etched with your required image but are available unetched if you have your own steel etching facilities. Various sizes are available, please call for details. With proper care these plates can be expected to last as follows: 0.5mm - 150,000+ prints, 1.0mm - 500,000+ prints, 10mm - 1 million+ prints.

### Grey Scale - Step Wedge



The Stouffer 21 step plate-maker sensitivity guide is designed to calibrate your plate-making process to your equipment. Plates need to be exposed for a certain amount of time, which is registered as steps on a sensitivity guide (a solid 9 to 11 is most common). Film and plate are placed in the exposure unit with the sensitivity guide positioned in a non image area. The plate is then exposed for the required amount of time. After the plate is exposed it is then developed. Because the sensitivity guide is also film, it too is reproduced on the plate. What the platemaker is looking for is a solid 8 to 10 on the guide image. If the image is only a solid 7 it indicates that more time is needed when exposing the plate. If it is a solid 13 it means that too much time was used. For more info call us for our usage guide.

● **Code: 2752057**

### Alcohol plate developer

For washing out alcohol plates during the developing process. Supplied in 1, 5 or 20l containers.

● **Code: 900150**



Teca-Print pads come in many hundreds of different shapes and sizes. In order to help the "non-expert" with pad selection, print area should first be designated either "round" or "square/rectangular". Once this has been decided a corresponding round or square pad geometry can be selected from the selector chart. Another important factor in pad selection is machine capacity. The pad down-stroke force of a machine is limited, harder pads require more force to compress as do pads with large areas. It is therefore important to choose a pad within the operating limitations of your machine. In terms of pad shape, the steeper the pad generally the sharper the printed image. The deeper the pad the less distortion of the image.

Type 1

Standard Pads with anti-static agent.

Pads are colour-coordinated for hardness and ease of identification.

- Blue = hard (64Shore)
- Green = soft (44Shore)
- Red = medium (54Shore)
- White = very soft (38Shore)

Type 2

Long Life Pads with a longer shelf life

These pads are denoted by letters.

- C = hard (64Shore)
- M = medium (54Shore)
- O = soft (44Shore)



Class 1 - Pads for circular surface prints



Class 2 - Pads for ring-shaped surface prints



Class 3 - Pads for square prints



Class 4 - Pads for rectangular prints



Class 5 - Pads for line prints



Class 6 - Special pad shapes

## Rectangular Pad Selector Guide

If you need to see what any of these pads look like, please call us for a catalogue or an emailed picture

PRINT LENGT	PRINT DEPT	PAD NUMBER	PRINT LENGT	PRINT DEPT	PAD NUMBER	PRINT LENGT	PRINT DEPT	PAD NUMBER
10	5	555	43	14	212	63	14	214
14	11	459	44	44	390	64	47	137
15	10	274	45	20	85	68	25	82
18	6	132	47	19	395	68	25	162
18	16	45	48	31	1017	70	20	185
19	16	84	49	23	403	70	20	109
23	20	885	50	10	184	73	38	190
24	24	506	50	10	382	74	39	56
24	16	1300	50	20	64	75	43	115
24	10	254	50	12	532	77	14	770
24	20	817	50	12	136	77	58	151
27	9	13	50	35	77	80	40	91
28	13	633	52	31	346	80	16	1299
29	16	156	53	14	213	80	9	1328
29	16	765	55	55	51	80	36	457
30	8	134	58	40	71	83	60	166
30	17	1032	58	30	1018	85	24	1135
30	14	19	60	60	101	85	21	209
33	25	78	60	15	49	85	25	87
34	34	62	60	60	22	85	40	140
35	10	135	60	20	86	85	42	1305
36	19	72	62	20	70	85	65	835
38	24	196	62	42	119	85	15	919
40	10	183	62	43	17	85	65	1072
85	85	28	113	78	939	192	44	144
87	40	883	114	45	30	192	29	200
87	35	878	114	70	742	195	32	1311
88	24	107	117	30	998	195	24	941
89	66	66	124	40	437	200	70	289
90	125	1034	125	26	918	206	45	79
90	65	865	126	98	73	209	14	69
90	22	820	127	87	108	210	20	428
90	58	83	130	78	54	218	86	142
90	75	61	133	60	44	218	52	195
93	55	163	137	45	43	220	20	176
95	32	1309	140	24	779	240	32	1278
95	90	867	145	70	880	245	16	1332
98	30	756	150	20	129	250	45	890
98	68	154	150	14	21	250	45	1008
98	64	378	152	100	558	270	7	265
98	12	118	155	42	1307	275	24	88
102	45	542	158	62	971	280	12	81
103	73	75	160	80	1016	320	30	181
104	21	74	160	35	103	320	20	175
105	60	29	165	70	949	380	96	1292
106	82	59	170	30	187	434	96	1277
110	58	24	176	36	326	434	42	1290
110	25	186	178	86	931	450	24	111

## Round Pad Selector Guide

If you need to see what any of these pads look like, please call us for a catalogue or an emailed picture

PRINT DIAMETER	PAD NUMBER	PRINT DIAMETER	PAD NUMBER	PRINT DIAMETER	PAD NUMBER	PRINT DIAMETER	PAD NUMBER
5.5	363	30	1120	51	8	80	1095
8	368	32	1060	52	42	81	65
11	605	32	1231	52	98	83	55
13	405	33	5	52	120	85	63
13.5	415	35	1	54	12	85	25
14.5	1119	35	1143	56	158	90	886
16	525	36	1140	58	894	100	1094
17	198	37	6	59	895	100	90
19	95	38	23	60	1065	100	637
22	1257	39	7	60	1012	100	636
22	199	39	10	61	105	105	896
23	92	40	11	62	1335	106	1184
24	864	43	50	64	58	111	1080
26	1005	45	1076	65	328	112	597
27	600	45	1066	69	27	115	834
27	4	46	1014	71	60	118	1215
28	548	46	159	78	570	118	1205
29	1129	49	2	80	1255	140	1313
30	1144	49	1331	80	1216		
30	1013	50	1261	80	1137		

## Pad Maintenance

Pad life ranges from 10,000 cycles to 100,000 cycles, depending on the application. The average lifespan is approximately 50,000. Print surfaces that are flat and free of ridges or protrusions will promote longer life than surfaces that contain these factors. Through extended periods of operation and contact with solvents that are present in ink, the silicone oil that is present in the pads is depleted. As the pad dries over time, its ability to pick up and release an image is severely reduced. Proper maintenance of pads can significantly enhance their life. One easy way is to use silicone oil. After each shift, remove the pad from the machine and rub a small amount of oil onto the pad's surface, then store the pad on the shelf positioned on its base. This will allow the newly applied oil to penetrate the pad body, thereby replenishing the oil that is lost in production. See page 12 for details of the silicone oil that is available from Handel & Sons.

## TESTING POLYOLEFINS FOR PRINTABILITY

In order to be able to print upon polyolefin plastics it is necessary to correctly pretreat the surface. The treated surface must have a specific surface energy value in order that the ink obtains sufficient adhesion.

Untreated PE and PP have a surface energy value of about 30mN/m. In order to be printed satisfactorily these plastics should have a surface energy value of at least 38-40 mN/m.

Materials with a surface energy value under 37mN/m frequently result in ink adhesion problems. This is easily seen by using the simple adhesive tape rip test.

The testing of various plastic and metal surfaces in order to determine their level of surface wettability is easily accomplished by using either test inks or test pens.

Both methods are simple and efficient and give immediate results varying according to the method used from a simple rough indication to a highly accurate and pin-pointable result. The test methods are designed to be carried out as a routine test by machine operators or other factory personnel, the results of which can be immediately evaluated and controlled by trained staff.

A test ink or pen having a middle value should be chosen as a start point, i.e. 38 mN/m. If the applied test ink or test pen solution WETS the surface for a period of at least 2 seconds after application the surface energy of the substrate is HIGHER than or EXACTLY that of the test ink or pen solution chosen.

A second test should be conducted with the next higher value test ink or pen and the process repeated until the test ink or pen solution beads (forms globules) within 2 seconds of application, at which point the previous value should be taken as the correct result.

Should the test ink or pen solution retract from the surface or go into globules, a test ink or pen of lower value should be used in a repeat test until one is found when the test ink or pen solution wets the surface.

In this manner it is possible to pin-point the level of surface tension/surface wettability and adjust as required the level of pretreatment of the surface in question to make it ink acceptable and thus provide the degree of adhesion required and one commensurate with normal industrial requirements.

The surface tension/surface wettability is a very definite criteria for the correct adhesion of printing inks onto polyolefins. There are however other factors which might affect the adhesion such as migration of anti-static or slip agent additives introduced during moulding. These do not always show up in this type of test and sometimes even though good levels of treatment are achieved the adhesion results are not acceptable. These cases can only be dealt with by technical discussions with the material suppliers. They are however seldom in occurrence and generally surface measurement values between 38-41mN/m will produce the required levels of ink adhesion. Conversely values under 37mN/m will give a very marginal result and values under 35 nM/m will almost always result in bad ink adhesion. If you require any clarification or further explanation, please do not hesitate to call Handel & Sons.

## PRETREATMENT OF POLYOLEFINS

The need for treatment of polyolefins is caused by their having an inert non-polar structure which does not permit any mechanical or chemical bonding between the moulding surface and the coating. Thus, pretreatment can be defined as the process to which a polyolefin moulding is subjected prior to the application of ink in order that the applied coating will have acceptable and permanent adhesion. Predominantly three methods are used - chemical, corona and flame. The most widely used, and arguably most effective, pretreatment process is flaming.

Flame treatment is currently the most versatile method for the pre-treatment of polyolefin surfaces. It is almost exclusively used for the pretreatment of blow moulded containers and is widely used for injection moulded articles.

Flaming consists of exposing the surface to be decorated to a suitable oxidising flame for a period in the range of 0.2 to 3.0 seconds. This treatment brings about a change to the polymer surface which makes it wettable and permits a strong adhesive bond between the moulding surface and the coating. This change in surface properties can be readily seen by immersing an untreated and a treated article in water. On removal, the water will run off in globules from the untreated article but will form a continuous film on the treated surface which will last for a varying length of time depending on the actual flaming conditions used. Tuning of the flame is critical to successful pre-treatment.

Please call us if you need any assistance with your pretreatment requirements. We also provide an economical testing and flaming service should you not have your own facilities.

## Operating Conditions

**W**orking conditions in your printroom are very important. Hot, windy and dry days can have a major influence on the results you achieve, as can an environment which is too cold, so it is worthwhile taking a moment to review your situation.

### Factory conditions -

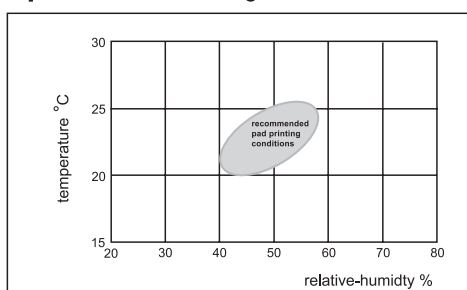
Consistency of conditions around your printing machines is very important. For example, if the machine is sited near a doorway which is constantly being opened then dust and draughts will have a strong influence on the performance of the print unit. Quite often the location of the machine is outside of your control but simple measures such as dust baffles and constant temperature air blowers on the machine can help to improve performance.

### Ambient temperature -

If your pad printer is sited in a high or low temperature area then this will have an adverse effect on the printing process. In a high temperature area the ink will transfer from the printing pad more readily due to the faster solvent evaporation, but at the cost of having to pay regular attention to the ink viscosity in the machine. Conversely, in a cold area solvent evaporation will be much slower and at very low temperatures will affect the consistency of ink transfer from the printing pad. A further disadvantage of processing and storing in too cold an area is the slow drying and curing of the print. Where products are brought from a storage area to the printing machine the change from a cold to warm environment can result in a fine film of condensation forming on the surface of the components. This can be very difficult to detect but can be the cause of inconsistent print quality and poor final adhesion. It is advisable to make sure that the products are moved to the printing area at least one hour before they are to be printed or are stored in an ambient temperature which is the same as the printing area. Some inks require a certain minimum temperature to ensure curing. It must be remembered that printed parts can only be removed to colder conditions after full curing of the ink, otherwise print quality may be compromised.

Of course the correct ambient conditions will go a long way towards minimising static, too. Where possible the atmosphere around the printing machine should be kept to 40% humidity and 20 degrees centigrade as a minimum.

### Optimal Pad Printing Conditions Chart



Form 594-REV 0 - 20.05.2002

## Maintenance

**K**eeping your pad printing machine in good shape not only helps maintain the value of your capital investment but ensures peak productivity. The following items form the basis of a good maintenance schedule.

### DAILY

1. Ensure old and dried ink is removed from all exposed parts of the printing machine particularly the area where printing plate and plate holder are attached. Two-part inks should be discarded after their 'pot life' has been exceeded.

### WEEKLY

1. Empty filter bowl of oil/water contaminants by pressing relief valve on base of bowl.
2. Check mains air pressure gauge reads 6 bar and adjust accordingly.
3. Check smooth operation of machine movements by adjusting flow regulators on side of machines.
4. Apply **one** drop of oil to air system by turning lubrication screw. See handbook for details.

### MONTHLY

1. Top up lubricating bowl as required.
2. Check and adjust doctor blade 'tilt' position by moving rear proximity sensor, see handbook for details.
3. Check condition of spatula 'lugs', ensure that they are at least 0.5mm high

### ANNUALLY

1. Replace back-up batteries in control box/panel.
2. Clean and lubricate all bearings and guide rods using Shell Alvania RA or equivalent.
3. Replace all internal air filters/silencers.
4. Check and adjust end stop dampers.
5. Check and adjust all proximity sensors.
6. Check condition of toothed belt in print head and adjust where necessary.
7. Adjust and re-tighten doctor blade actuating rod.
8. Check actuation of solenoid valves and signals.
9. Adjust dampers on pneumatic cylinders.
10. Check contacts in foot switch and connection plug.

Handel & Sons  
provides a low cost

**PRINT SURFACE TESTING AND  
PRE-TREATMENT SERVICE**

and

**PLASTIC IDENTIFICATION SERVICE**

Please call us for assistance in these areas.

### Possible Printing Faults

A printing pad can only yield as good an image as it has picked up. If faults occur, check the following first:

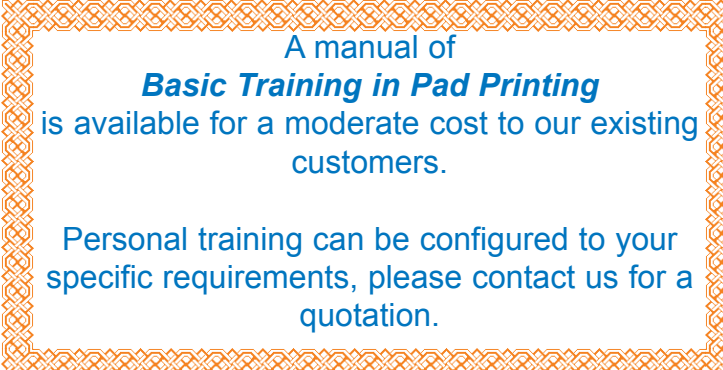
- Is the plate covered with ink?
- Check the ink pick-up on the pad (with mirror).

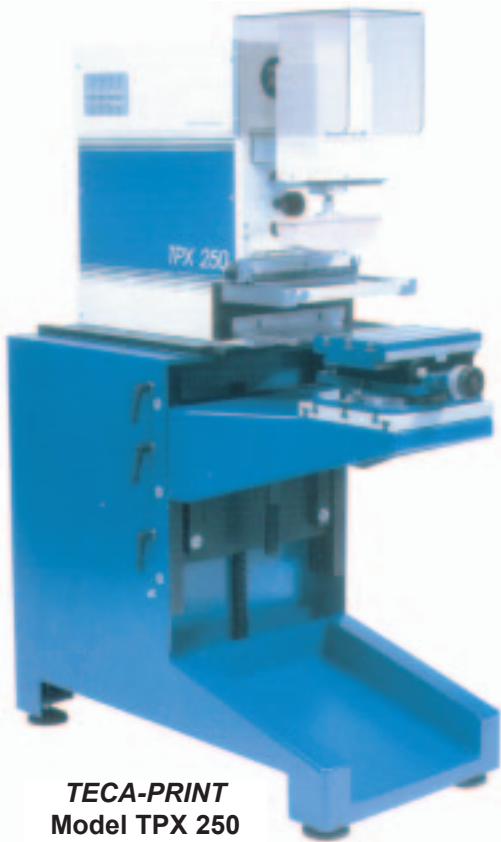
Fault	Cause	Remedy
<b>Holes in print</b>	<ul style="list-style-type: none"> <li>• Air bubbles on ink pick-up.</li> <li>• Ink too thin.</li> <li>• Pad too flat.</li> <li>• Pad down-stroke too fast; hence too high a roll-over speed of pad print surface.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust for thicker ink.</li> <li>• Use steeper pad.</li> <li>• Reduce speed of pad down-stroke.</li> </ul>
<b>Splashes (Static)</b>	<ul style="list-style-type: none"> <li>• Pad is splashed, (fine hairs around image) occurs as pad retracts from plate or product.</li> </ul> <p><b>Reason:</b></p> <ul style="list-style-type: none"> <li>• Some of the deformation energy is converted to a static charge in the pad and the ink.</li> <li>• Occurs with static prone materials, e.g. styrene/ABS.</li> </ul>	<ul style="list-style-type: none"> <li>• Check the pad after ink pick-up (mirror)</li> <li>• Adjust for thinner ink.</li> <li>• Use a softer pad.</li> <li>• Fit an ionizing rod in front of the plate.</li> <li>• Set the pad to slow lift.</li> </ul>
<b>Clouds</b>	<ul style="list-style-type: none"> <li>• Occurs frequently in wide-area print zones (pad float), especially when printing non-flat surfaces; e.g. cylinders, cones.</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust for thicker ink.</li> <li>• Direct cold air onto ink on pad.</li> <li>• Use a larger pad.</li> <li>• Use a backing plate to support long pads.</li> </ul>
<b>Distortion</b>	<ul style="list-style-type: none"> <li>• Print surface has low points or high points, or is smaller than the pad area.</li> <li>• Print on non-flat surfaces is always distorted.</li> </ul>	<ul style="list-style-type: none"> <li>• Fill the low points, expand the pad roll surface by special jiggling.</li> <li>• Special measures necessary to adjust artwork.</li> <li>• Use largest pad possible.</li> </ul>
<b>Too little ink (insufficient opacity)</b>	<ul style="list-style-type: none"> <li>• Ink too thick (viscosity).</li> <li>• Pad not yet activated.</li> <li>• Inadequate plate depth, or ink clotted.</li> <li>• Machine cycle time is too long or too irregular.</li> <li>• Pad retains too much ink.</li> </ul>	<ul style="list-style-type: none"> <li>• Thin the ink.</li> <li>• Activate pad with thinner.</li> <li>• Check the plate and clean if necessary.</li> <li>• Reduce machine cycle time. Work with automatic control. Check workbench layout.</li> <li>• Blow cold air on pad, or prolong time between ink take-up and deposit. (Do not use retarder)</li> <li>• If possible print onto pre-warmed components.</li> </ul>
<b>Ink distribution non-uniform</b>	<ul style="list-style-type: none"> <li>• Plate/film not sound. Depth of etch irregular.</li> <li>• Plate part-clogged with ink.</li> <li>• Ink is squeezed out image in the plate by the pad.</li> <li>• Pad stroke too short.</li> <li>• Ink coverage of plate is patchy.</li> <li>• Too little ink.</li> </ul>	<ul style="list-style-type: none"> <li>• Check the film.</li> <li>• Clean the plate.</li> <li>• Increase ink viscosity.</li> <li>• Correct pad stroke.</li> <li>• Check ink coverage of plate.</li> <li>• Top up with pre-mixed ink.</li> </ul>
<b>Contours not clear-cut</b>	<ul style="list-style-type: none"> <li>• Ink too thin. Ink is squeezed out image in the plate by the pad.</li> <li>• Cycle time is too long or too irregular.</li> <li>• Pad stroke too short.</li> <li>• Retarder used.</li> <li>• Possibly too great an etching depth &gt;30 microns.</li> <li>• Over pressurising of the pad on irregular surfaces.</li> </ul>	<ul style="list-style-type: none"> <li>• Increase ink viscosity.</li> <li>• Keep to cycle time.</li> <li>• Correct pad stroke.</li> <li>• Work without retarder.</li> <li>• New plate. Etching depth for steel plate: Normal 25 microns (+/- 2 microns)</li> <li>• Use plastic plate screen film E 7812</li> </ul>



# INDEX

A, thinner	7	Printability, testing polyolefins	19,20
Adhesion promoter, FX209	8	Optimum working conditions	20
Alcohol plate developer	15	Retarder	9
Anti-static paste	9	Rubber gloves	13
B, thinner	7	Screen film	14
BGA, thinner	7	Screen spray	11
CAN, thinner	7	Silicone oil	12
CF, thinner	7	Spray	11
Developer	15	Spray bottle	14
Developing tray	14	Step wedge, grey scale	15
Doctor blade	12	Stouffer, grey scale	15
Doctor blade polishing cloth	11	Substrate compatibility, ink selector guide	5
Dyne pen	10	Super retarder	9
Exposure unit	14	Tape, clear	12
Flow agents	8	Tape, double sided	12
FX 209, adhesion promoter	8	Technical tips	19-21
General supplies	12	Test inks	10
Gloves, cotton	13	Test pen	10
Gloves, disposable	13	Testing polyolefins	19,20
Gloves, rubber	13	Thinner	7
Grey scale, step wedge	15	Thinner bottle	11
Hand cleaner	13	TP 219, hardener	7
Hardener	7	TP 219 N, hardener	7
Hardener bottle	11	TP 219 N 00,hardener	7
Ink, range - suitability - colour	4,5,6	TP 219 ON, hardener	7
LAB-N 111420, anti-static paste	9	TP 219/GL, hardener	7
LAB-N 111420/VP, retarder paste	9	TP 219/GL-02, hardener	7
Magnifying glass	13	TP 262, thinner	7,8
Maintenance	20	TPD, retarder	9
Mixing cups	10	TPV, retarder	9
Mixing sticks	10	Training, see below	
Operating conditions	20	Trouble shooting	21
Order form	22	URS, platewash	11
Pad maintenance	12,18	Viscosity	10
Pads	16	Viscospatula	10
Pads, rectangular	17	VM1, flow agent	8
Pads, round	18	VM2, flow agent	8
Paper towel	12	VM3, flow agent	8
Plate, long life	15	Wash-up solvent, URS	11
Plate, polymer	15		
Plate, steel	15		
Platemaking	14		
Platewash, URS	11		
Platewash RM	11		
Plush cloth	14		
Polishing cloth, doctor blade	11		
PP, primer	9		
Pre-treatment	19,20		
Primer	9		
Print remover	8		


  
 A manual of  
**Basic Training in Pad Printing**  
 is available for a moderate cost to our existing  
 customers.  
  
 Personal training can be configured to your  
 specific requirements, please contact us for a  
 quotation.



**TECA-PRINT**  
Model TPX 250



**TECA-PRINT**  
Model TPE 100



**TECA-PRINT**  
Model TPU 131



**TECA-PRINT**  
Model TPU 251



**TECA-PRINT**  
Model WG700



**TECA-PRINT**  
Model TPX 500

HANDEL & SONS PTY LTD  
www.handel.com.au  
email: info@handel.com.au  
Freecall: 1800 998 998

50 Renver Road, Clayton, Victoria  
Telephone: 03 9544 2433  
Facsimile: 03 9543 7528

705-707 Parramatta Road, Leichhardt, NSW  
Telephone: 02 9568 3322  
Facsimile: 02 9550 0387