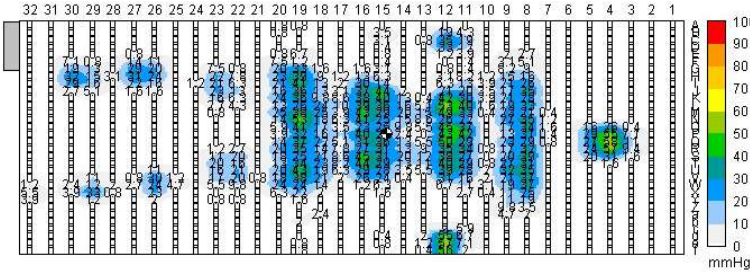
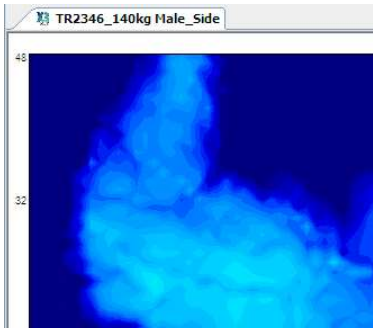
Clinical Studies and Pressure Mapping





Diamond Auto 8 Case Study 1

Purpose:
To evaluate the therapeutic effect of the Diamond Auto 8 as a support surface to treat an existing pressure ulcer in a long term homecare patient with multiple complications.

Subject:
Subject was an 81 year old female with hypertension, diabetic and apoplexy. She was admitted to this long term homecare project with an existing category III pressure ulcer at heel. Multiple barriers to healing included immobility and chronic illness.

Case setting:
Subject stayed at home and was taking care by a caregiver from a long term homecare project, conducted by New Taipei City Social Bureau. Nursing team approached this subject every week.

Method:
Nursing team treated this subject by using standard procedure for chronic pressure related wound. Multidiscipline care included nutritional, intervention, physical therapy. The support surface implemented for this project was the Diamond Auto 8, an alternating pressure mattress replacement. Prior to admission, the subject was on a normal foam mattress.

Results:
Wound healing progressed was shown in Table 1.

Conclusion:
A category III pressure ulcer was heading to healing within 2 month period. The Diamond Auto 8 demonstrated an impressive positive outcome with a simple mattress replaced.

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Table 1 Wound healing progress				
Date	2011/11/03	2011/11/11	2011/12/02	2012/01/11
Category	3	3	2	1
Size(cm) LxWxD	2x1.5x0.2	1.5x1x0.2	1.5x1	resurfaced
Appearance	Yellow with slough	Red	Pale	Pink
Exudates	moderate	minor	no	no
Odor	None	None	None	None
Wound edges	Erythema	Erythema	-	-

PS: 2011/11/03 indicated the wound size before support surface admitted.
2011/11/03 indicated the wound size after support surface admitted.

Fig 1 2011/11/03

Fig 2 2011/11/11

Fig 3 2011/12/02

Fig 3 2012/01/11

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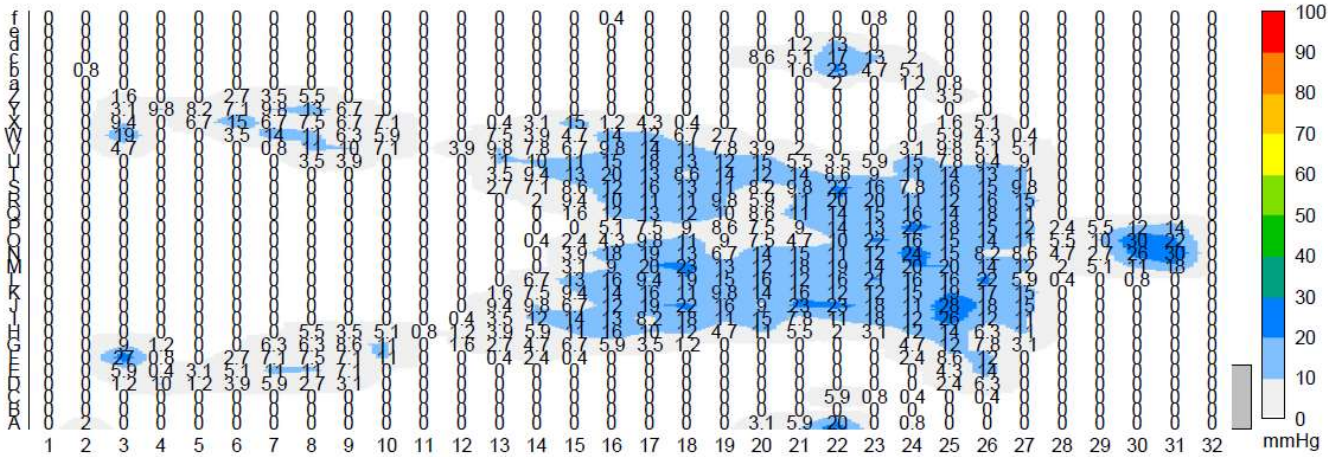
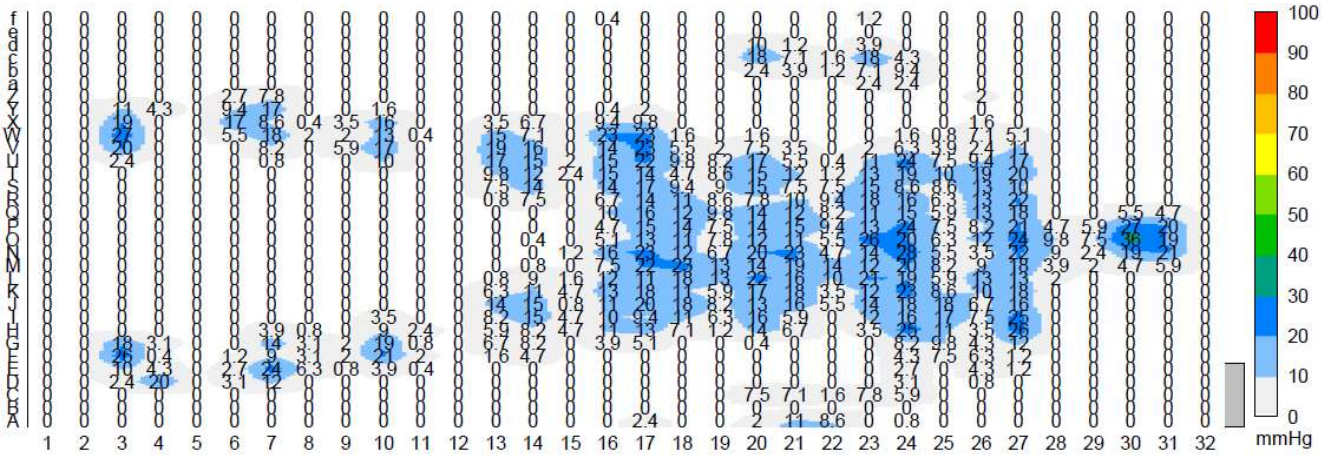
Sterling 211
Patient: 85kg
Therapy mode: Static
Comfort Level: 1



Sterling 211
Patient: 85kg
Therapy mode: Alternating
Comfort Level: 1



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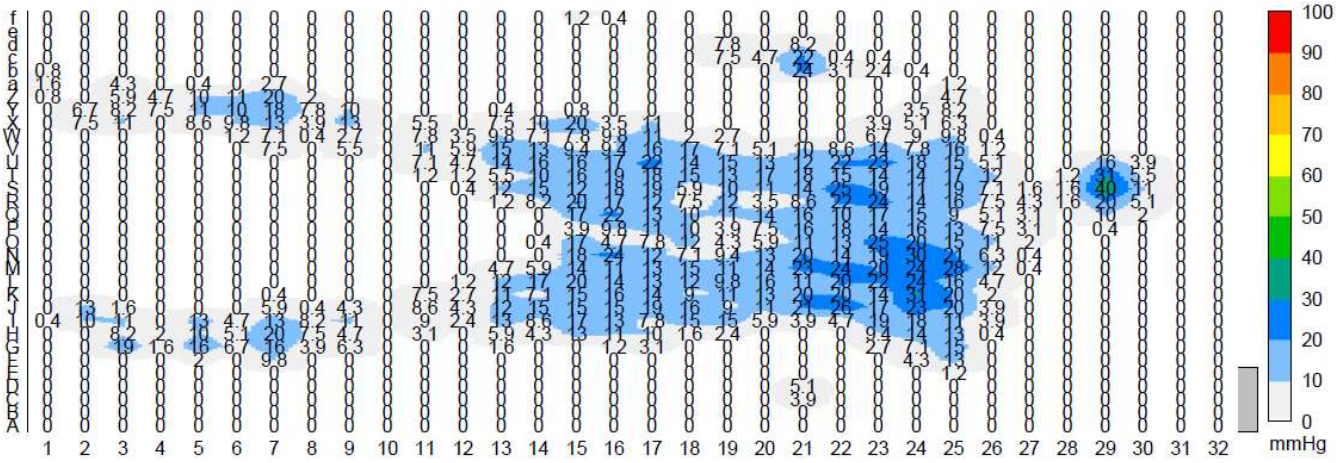
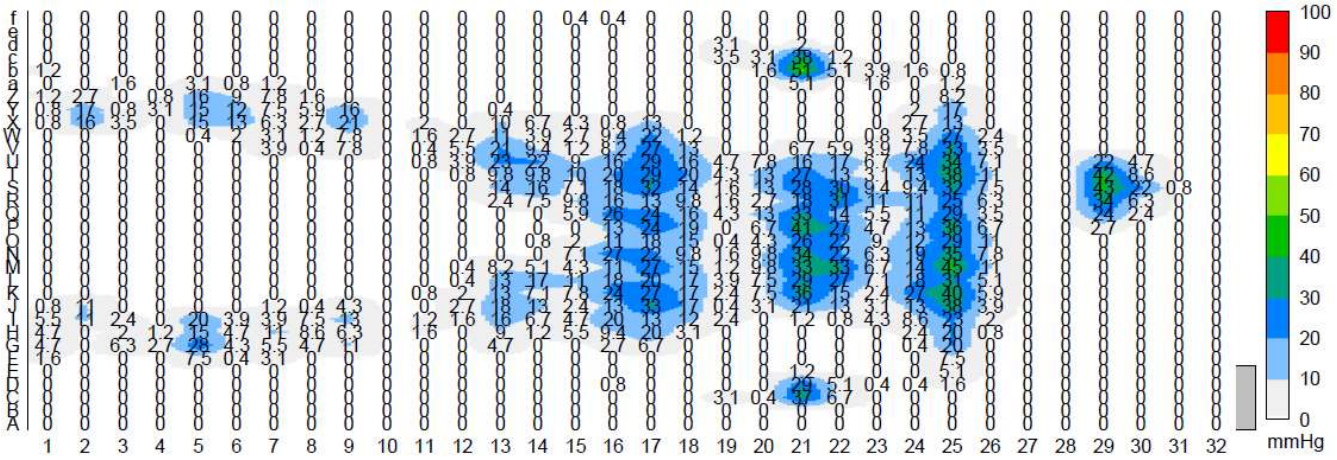
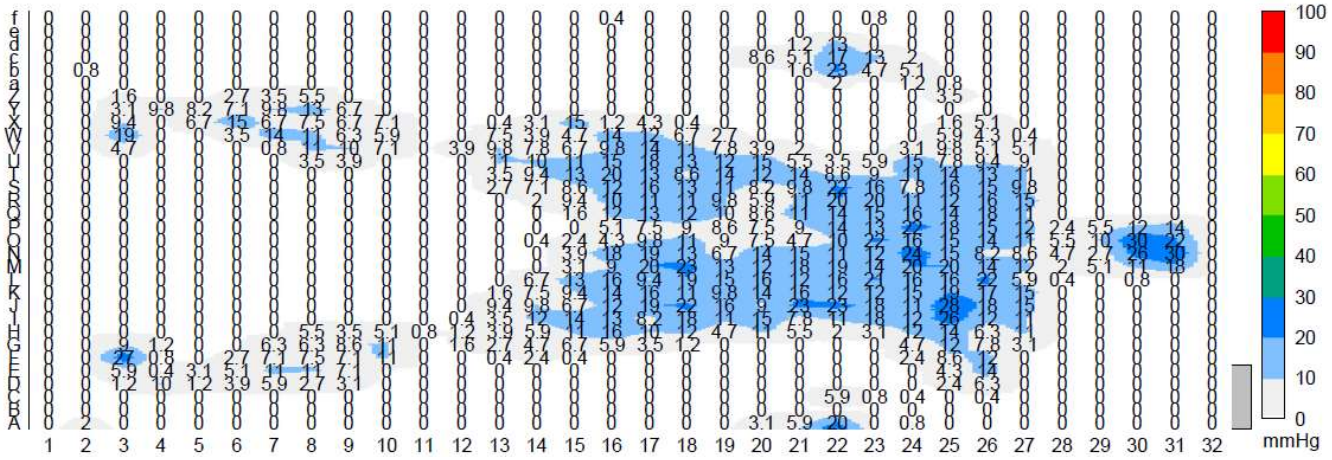
Diamond Auto 5
Patient: 85kg
Therapy mode: Static
Comfort Level: Auto



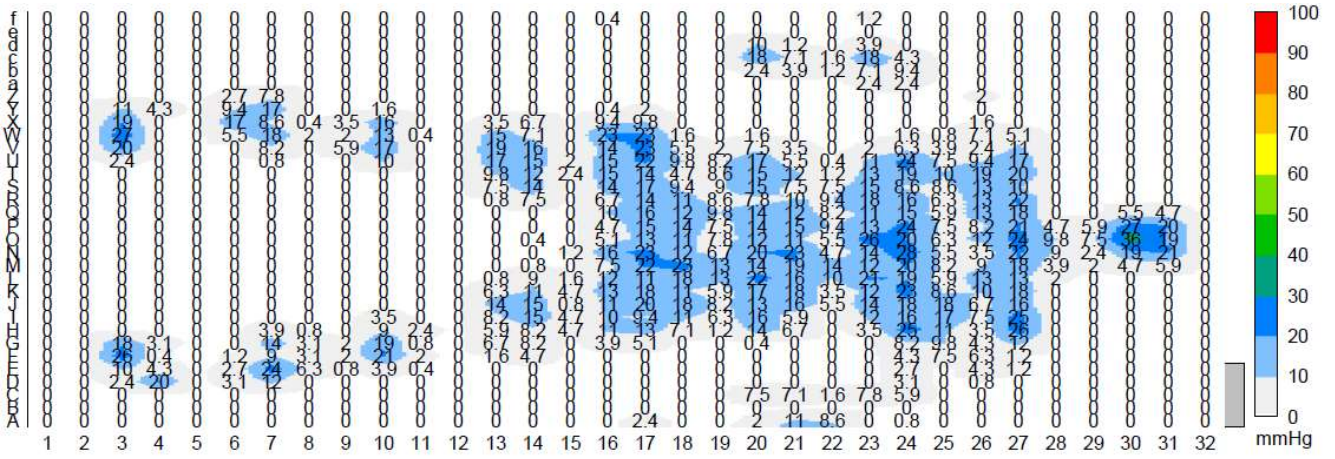
Diamond Auto 5
Patient: 85kg
Therapy mode: Alternating
Comfort Level: Auto



Emerald 320
Patient: 85kg
Therapy mode: Static
Comfort Level: 1



Emerald 320
Patient: 85kg
Therapy mode: Alternating
Comfort Level: 1



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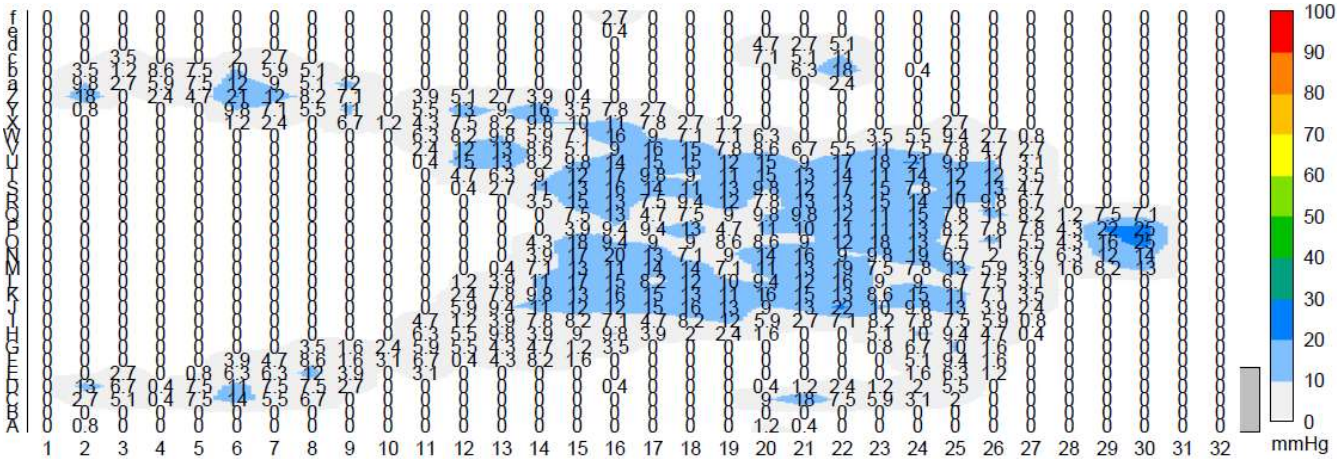
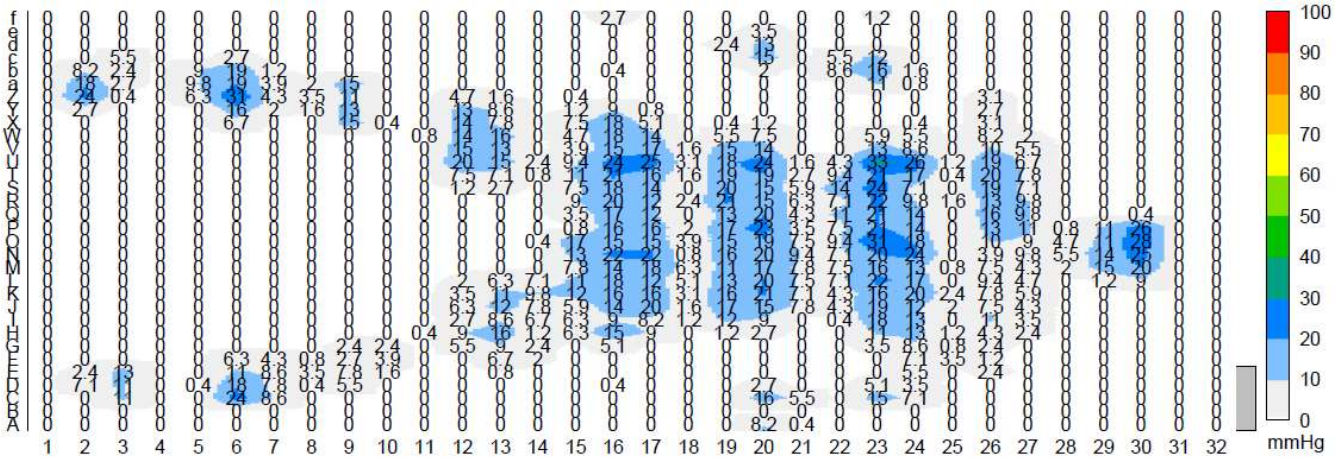
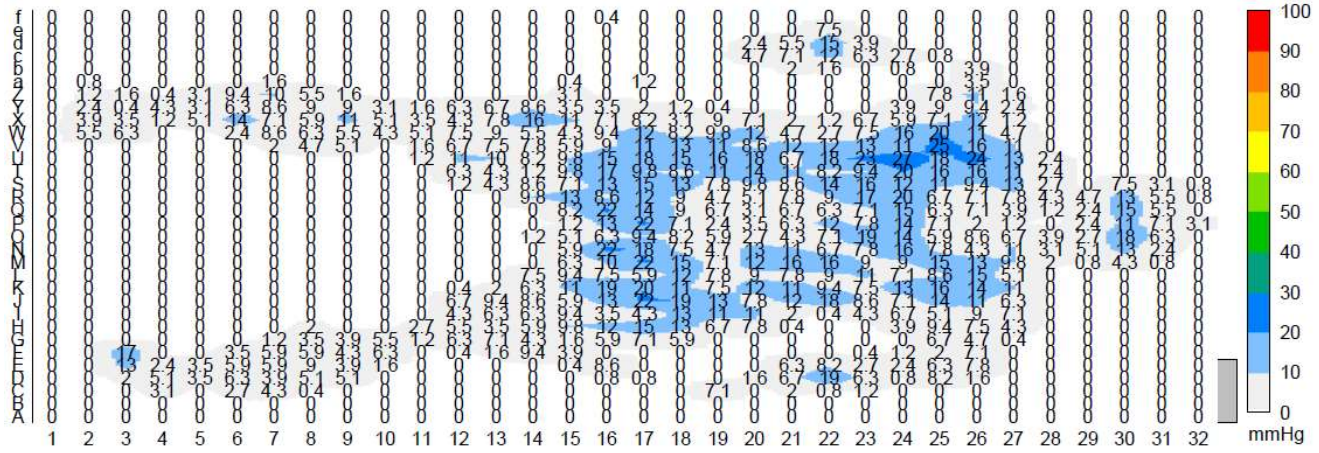
Diamond Auto 8
Patient: 85kg
Therapy mode: Static
Comfort Level: Auto



Diamond Auto 8
Patient: 85kg
Therapy mode: Alternating
Comfort Level: Auto



Onyx LAL (Low air loss mattress)
Patient: 85kg
Therapy mode: Static
Comfort Level: 3



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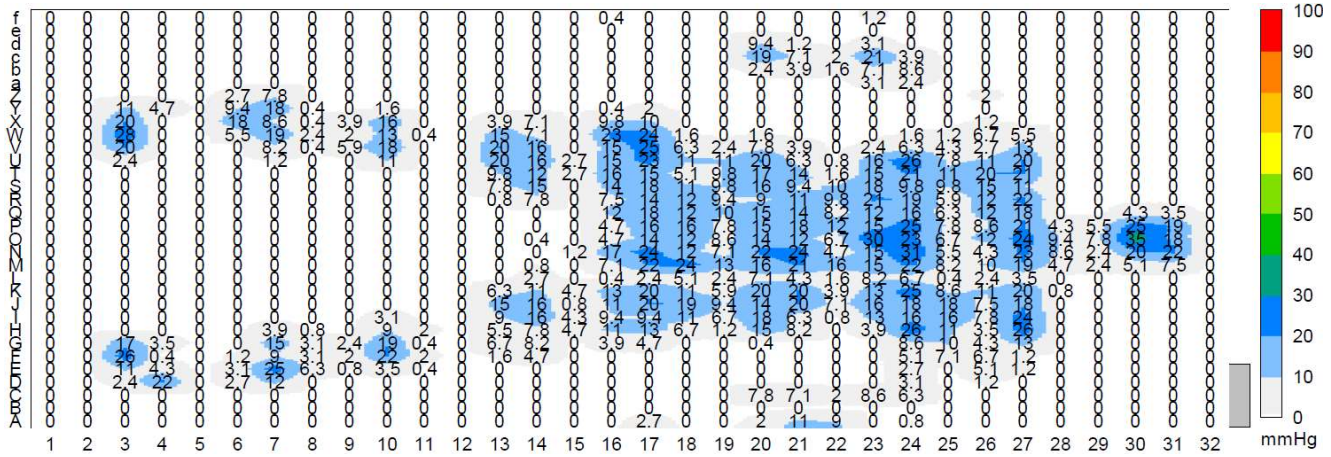
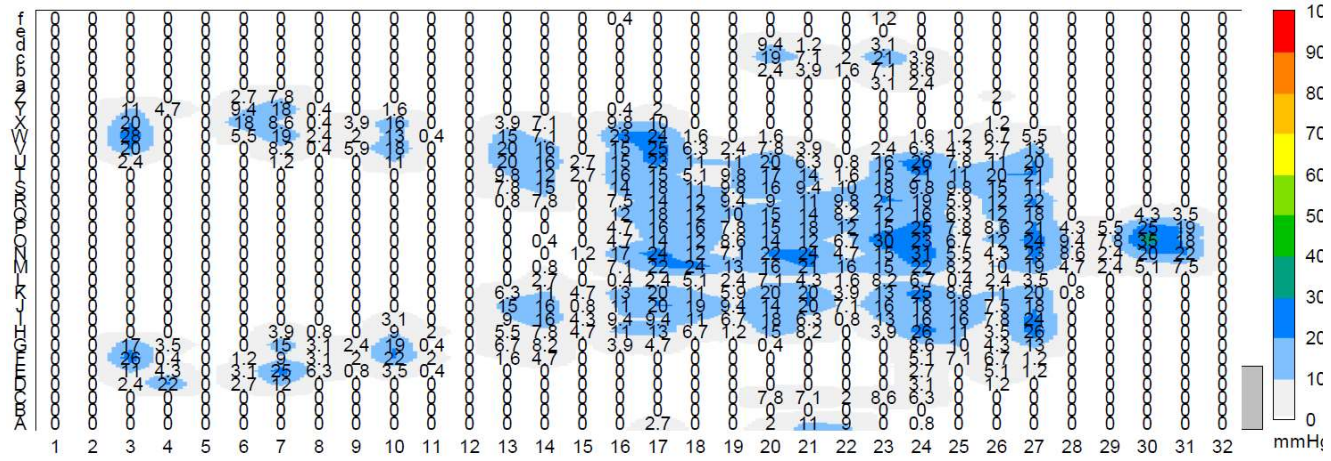
Platinum Max (Bariatric mattress)
Patient: 85kg
Therapy mode: Static
Comfort Level: 1



Platinum Max (Bariatric mattress)
Patient: 85kg
Therapy mode: Alternating
Comfort Level: 1



WHAT THE EXPERTS SAY...

DUNLOP FOAMS
COMFORT THAT LASTS

UNDERSTANDING PRESSURE RE-DISTRIBUTION

Choosing a good quality support surface for all beds in health care facilities provides the basis of a robust skin integrity and pressure ulcer prevention program. By providing a surface that redistributes pressure by immersion into the foam layers the patient is more comfortable and the surface is more clinically effective.

The basic foam mattress used in the past has been shown to be a contributing factor to the high incidence of pressure ulcer prevalence in both acute and aged care facilities. Choosing a quality high specification (grade) foam mattress replacement is an important feature of your skin integrity program and a proactive way of reducing pressure ulcer risk[1].

Combined with pressure ulcer risk assessment knowing you have chosen a good quality base mattress for all beds provides much better protection for all 'at risk' patients[2]. Those patients with 'medium to high risk' of developing a pressure ulcer will require a combination of nursing intervention, turning regimes and the allocation of mattresses with greater pressure distribution properties.

What guidelines are available to assist you and guide your choice?

Prior to 2004 there were no standards available to guide the quality of foam used or the covers of this important piece of hospital equipment. Following an extensive investigation of mattress specifications a recommended minimum standard foam mattress with a density-hardness of at least 35-130 foam with a minimum depth of 150mm was presented[3]. This minimum data set has been accepted and used to guide mattress selection and replacement by government authorities[4].

1. Cullum, N. Deeks, J. Sheldon, T. Song, F. Fletcher, A. Beds, mattresses and cushions for pressure sore prevention and treatment The Cochrane Collaboration. The Cochrane Library. 2001, Issue 1
2. Dealey, C. (2005) The Care of Wounds a Guide for Nurses, Blackwell, UK pp 134
3. Dean, S. Young, C. Pressure reduction foam mattress replacements part 1 – What are you buying? The Product. Presentation at 5th National Australian Wound Management Association Conference. March 2004
4. VQC State-wide PUPPS Report – 2003 Metropolitan health and Aged Care Division Victorian Government Department of Human Services Melbourne Victoria 2004 http://qualitycouncil.health.vic.gov.au/

Dunlop Foam Pressure Mapping

WHAT THE EXPERTS SAY...

DUNLOP FOAMS
COMFORT THAT LASTS

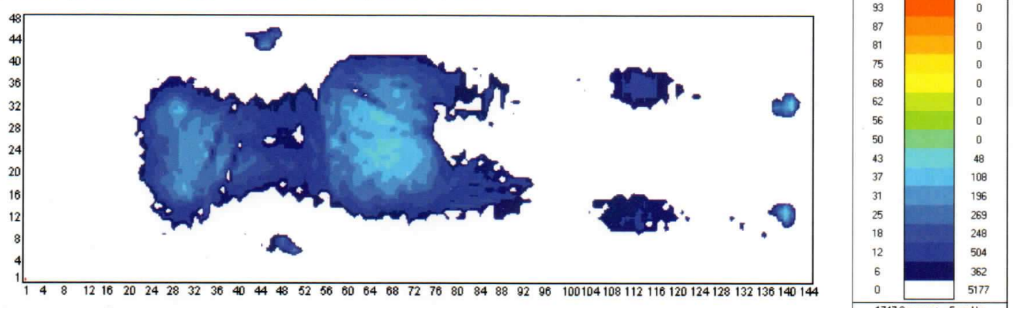
PRESSURE MAPPING

Pressure mapping is an effective tool for individual assessment of the pressure distribution properties of mattresses. It must only be used as a guide as results will vary depending on the patient.

Dunlop Foams expert Research and Development team can work with you to develop unique product offerings through the use of in-house pressure mapping technologies. Below is an example of the pressure mapping results of the core products using Xsensor, X2 Bodysensor System equipment on a medium weight male (75kg/175cm) participant on their side and back:

Product	*Position*	*Peak Pressure (mmHg)*			*Overall Pressure (mmHg)*	*Contact Area (cm^2)*	*% Area under 50mmHg*
		Upper back/ Shoulders	*Buttocks/ Hip*	*Foot/ Heel*			
JBFOAMC	Back		64	57	22.7	2124	98.1
	Side	67	116	40	27.5	2140	94.1
JBFOAMRL	Back		64	70	23.7	2185	98.7
	Side	72	102	27	28.1	2187	94.1
Tima C	Back		57	60	25.2	2356	98.8
	Side	63	95	20	27.1	2235	94.8
Mezzo A	Back		55	54	23.1	2484	99.5
	Side	67	103	48	26.4	2447	94.8
Mezzo B	Back		51	59	23.1	2543	99.3
	Side	59	119	50	27.4	2417	95.2
Mezzo C	Back		46	73	21.4	2782	99.5
	Side	91	90	37	26.0	2514	95.3
JBFOAMRLP	Back		48	59	20.4	2958	99.7
	Side	53	98	44	24.4	2647	97.3
Replete B	Back		48	47	20.6	2817	100.0
	Side	68	95	21	24.1	2735	96.8
Replete C	Back		46	54	20.3	3247	99.8
	Side	84	110	34	24.2	2953	96.9

Below: pressure map results for Replete B, back.



Quality Endorsed Company

A Division of Pacific Brands Household Products Pty. Ltd.

ABN 23 098 742 584

36 Commercial Drive, Private Bag 1499,

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Tel: 03 - 9215 2020 Fax: 03 - 9215 2015

Form No: DF01-0805
Issue: B
Project code: TR 2346

DUNLOP FOAMS

LABORATORY REPORT No. 1994

DISTRIBUTION:	**L.HOWELL**
cc.	**P.McNAMARRA, R.SACK**
DATE:	**2nd SEPTEMBER 2011**
FROM:	**C.GUILLOT**
CUSTOMER:	**JB MEDICAL EQUIPMENT**

PRESSURE MAPPING ASSESSMENT OF HEALTHCARE MATTRESS DESIGN

SUMMARY:

A Healthcare mattress design with flexible vapour permeable top cover was supplied on behalf of JB Medical, to the Dunlop Foams Technical Laboratory, for Pressure Mapping assessment using the X-sensor device.

Pressure mapping is a valuable tool in the evaluation of the support and comfort level of a subject on a particular surface. It may be used as part of assessing the suitability of mattress designs, for their intended purpose. Other characteristics, such as mattress durability, softening and height loss in service, and the highest load supported by each mattress are not covered here.

SAMPLE DESCRIPTION

Sample I.D.	Foam Grades	Other
A : FN121767	40mm LR38-40 40mm HG39-140 40mm HG39-170 40mm ST35-200	Cover: Navy Blue Flexible PU with zip Side rails: ST35-200

EXPERIMENTAL

- Pressure Mapping

Using the Xsensor pressure sensor matt, the interface pressure between the body of each subject and mattress was measured, with the subject lying flat on the back and then on the side. Once the subject settled down, 300 recordings were taken over 5 minute periods in each lying position and the recorded results were analysed using the statistical function of the X3 software.

Subject Key	Gender	Weight (kg)	Height (cm)
140kg-M	Male	140	184

Equipment: Xsensor Pressure Mapping System – Model X3
Location: Dunlop Foams Technical Laboratory, South Dandenong, Vic.
Tested on: 29th Aug-2011 Tested by: S.Bencich

RESULTS:

Table 1 - Pressure Mapping Results using the X-Sensor System

Mattress Design and Subject	Subject Lying Position	Average (Overall) pressure mmHg	Back / Shoulder Pressure (mmHg) Avg / Peak	Buttock / Hip Pressure (mmHg) Avg / Peak	Foot / Heel Pressure (mmHg) Avg / Peak	Contact area, cm²	Percentage Peak Pressure under 35 / 50mmHg
140kg-M	Back	30.4	41 / 43	46 / 45	35 / 41	3110	75 / 100
	Side	30.0	50	59	34	4111	68 / 99
	Back 45° Incline	25.7	43 / 44	59 / 60	45 / 46	4263	85 / 99

Note: It is recommended that the interface pressure for most subjects does not exceed 35 mmHg. Peak pressures over 50 mmHg may cause slight discomfort, depending on the extent of the high pressure area and the person's physical condition.

COMMENTS:

- The average (overall) interface pressure measured on the mattress supplied was found to be well below 35mmHg for the heavy weight subject tested here.
- Based on the above pressure readings, the mattress may be suitable for this subject, with a high percentage peak pressure recorded under 50mmHg.
- The results and trends predicted here are intended to be used only for comparison, for the heavy weight subject tested here and may not be indicative of trends for lighter or heavier subjects.

Christine Guillot
Technical Services Manager

FIG 1: MATTRESS - 140kg male subject- back lying

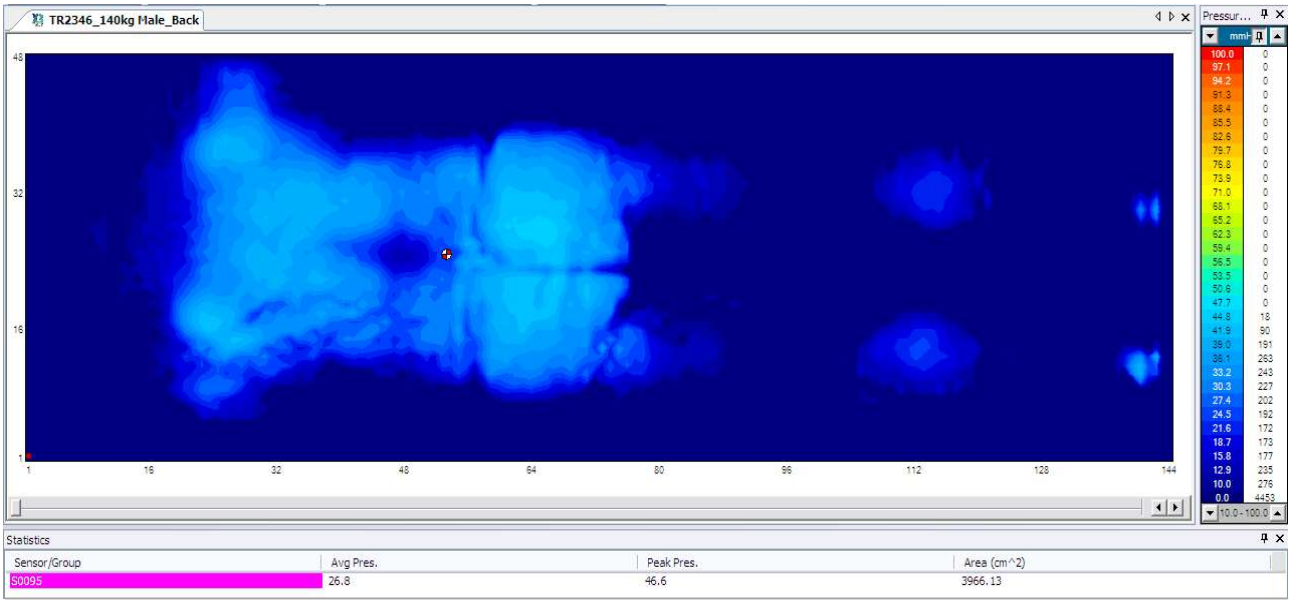


FIG 2: MATTRESS - 140kg male subject- side lying

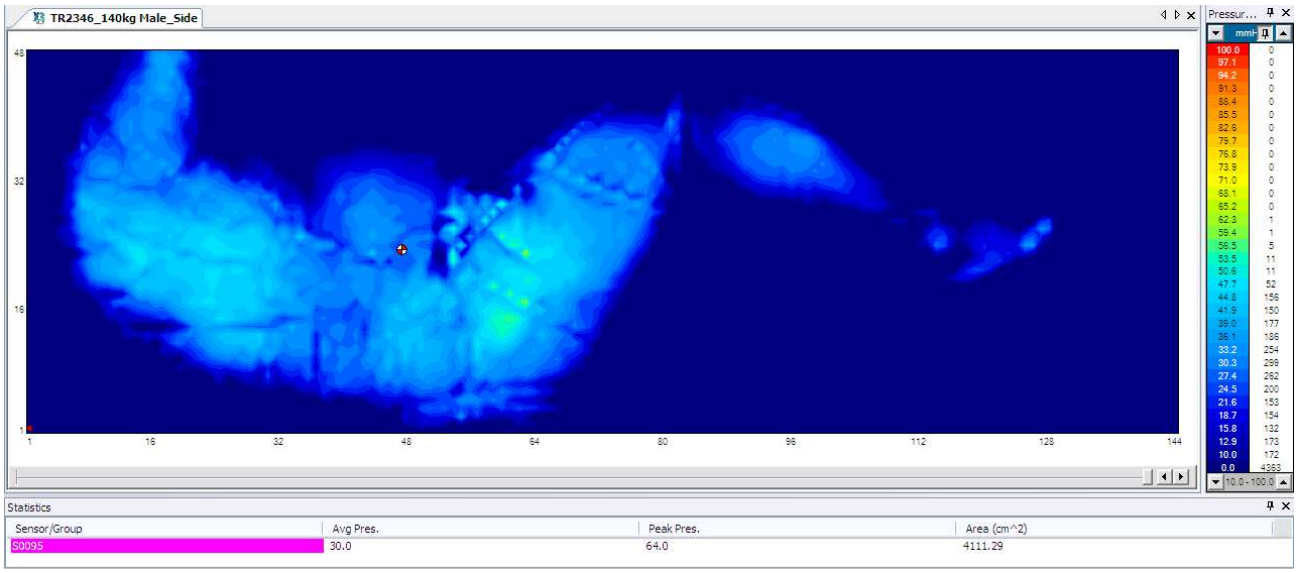
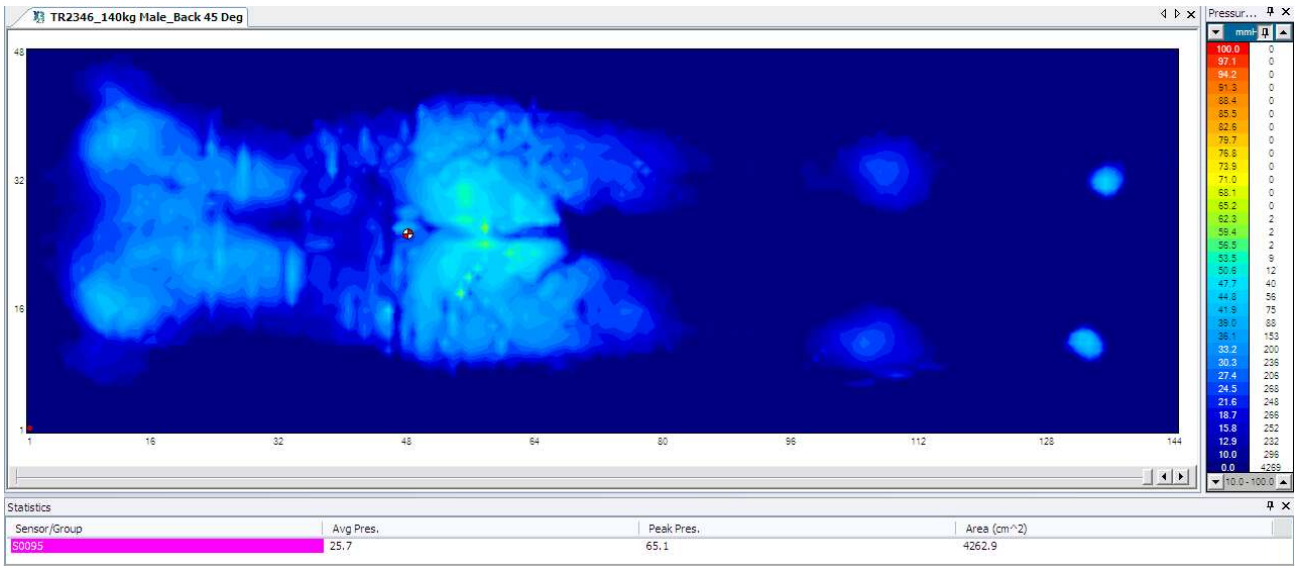


FIG 3: MATTRESS A - Maxi - 140kg male subject - 45° Incline



Important notes:

- Interface measurements alone should not be used in making decisions about pressure distribution for individual subjects. Results may vary from subject to subject and will depend on the type of measuring device used.
- These estimates should only be used for design purposes as they are subject to change as the surface properties can change in use. The results may be used for comparison only and are not considered absolute measurements.
- Although it is generally estimated, that capillary closing pressure can be between 35 mmHg & 50 mmHg in light to medium weight, healthy subjects, in each case however, this limit can be lower or higher as the maximum interface pressure limit is not standardised (i.e. the level of pressure that prevents occlusion of the underlying blood supply will vary for each individual).

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