

## Discover the Benefit of Panadoxine™ P

Panadoxine™ P is a pro form of Pyridoxine (Vitamin B6) and is released as Vitamin B6 by internal enzyme. Due to its stability, Panadoxine™ P is a useful source of Vitamin B6 in the human skin, hair and body. Such mild Vitamin B6 provides long-term regulation of oily and sensitive skin.

### Trade Name

Panadoxine™ P

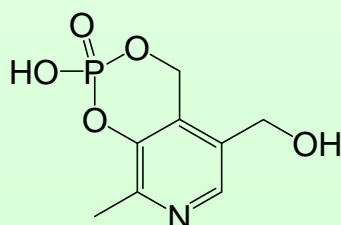
### INCI Name

Pyridoxine Cyclic Phosphate

### Chemical Names

- Pyridoxine-3,4'-cyclic-Phosphate
- 4H-1,3,2-Dioxaphosphorino[4,5-c]pyridine-5-methanol,2-hydroxy-8-methyl-,2-oxide

### Chemical Structure



### Empirical Formula

$C_8H_{10}NO_5P$  (MW 231.14)

### Specifications

Appearance	White to light yellow
Solubility	Soluble in water
Purity	≥ 95% by HPLC
pH (2% in water)	2.7-3.1
Water content	5% ≥
Identification (1)	Phenolic OH (+)
Identification (2)	Phosphate
Color of solution	Colorless
Heavy metals	10 ppm ≥
Arsenic	1 ppm ≥
Chloride	0.25% ≥
Loss on Drying:	0.5% ≥
Assay	≥ 95% by HPLC

### Storage

Room temperature ( $\leq 25^\circ\text{C}$ )

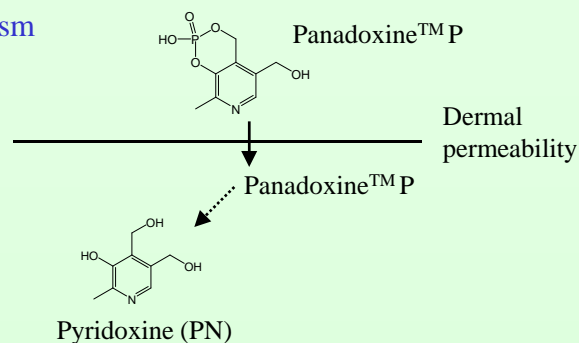
### Packing

1kg or 10kg packed in aluminum-laminated bag



White to light yellow powder

### Metabolism

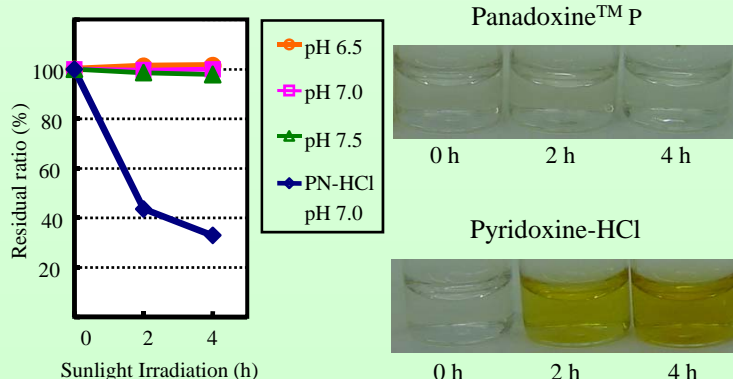


### Stability

- Good stability under sunlight and thermo
- Good stability at pH range 6.5-8.0
- Good stability with other vitamins

### Photostability Test

Panadoxine™ P is very stable under sunlight



### Formulating Techniques

- Panadoxine™ P can be added to the aqueous phase and formulation under  $60^\circ\text{C}$ .

### Suggested Use Levels

- Skin, Hair care 0.5-3 %

### Safety Studies

Acute toxicity (po)	$LD_{50} : >2000 \text{ mg/kg}$
Skin irritation	Negative
Eye irritation	Negative
Skin sensitization (LLNA)	Negative
Phototoxicity	Negative
Photosensitivity	Negative
Mutagenicity (Ames test)	Negative
Patch (human)	Negative

# Panadoxine™ P (Pyridoxine Cyclic Phosphate)

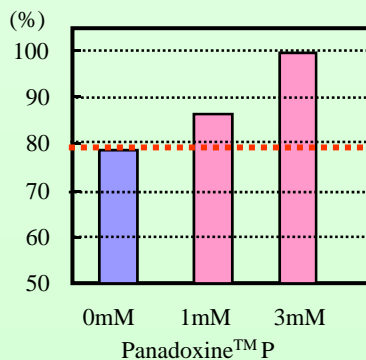
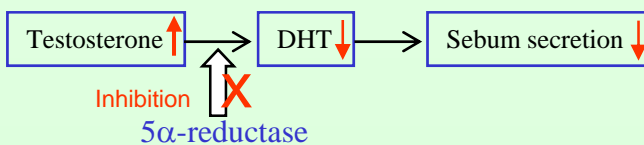
## Property (1)

- Panadoxine™ P reduces oiliness by inhibiting 5 $\alpha$ -reductase.

## Efficacy Tests

### In vitro test

5 $\alpha$ -reductase catalyses testosterone to dihydrotestosterone (DHT). DHT stimulates sebum secretion. Panadoxine™ P inhibits 5 $\alpha$ -reductase. It induces to remain testosterone and reduce sebum secretion.



Residual ratio of testosterone

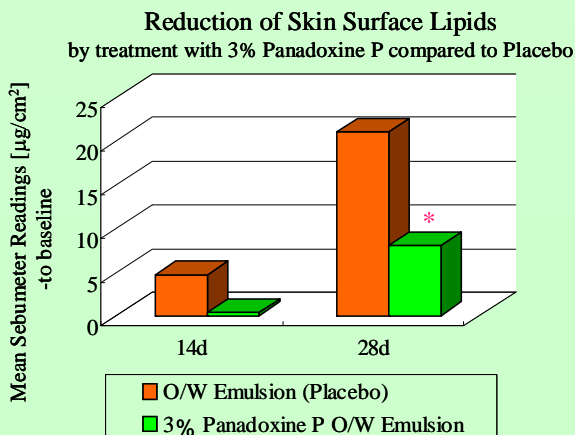
Daiichi Fine Chemical data

### In vivo test

Panadoxine™ P reduced human skin surface lipids.

	Reduction of Skin Surface Lipids ( $\mu\text{g}/\text{cm}^2$ )
14days	4.35
28days	12.97*

\* A formulation with 3% of Panadoxine™ P was found statistically significantly reduction of skin surface lipids after 28 days compare to Placebo (n=20).



Derma Consult Concept GmbH data

## Property (2)

- Panadoxine™ P reduces skin inflammation by lowering IL-8 and IL-6 levels.

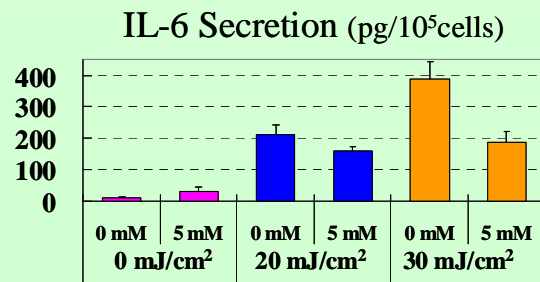
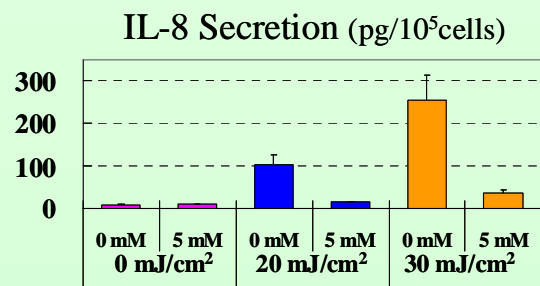
## Efficacy Tests

### In vitro test

IL-8 and IL-6 secretion from human skin keratinocyte is inhibited by Panadoxine™ P.

	Inhibition by 5mM Panadoxine P
IL-8	85.6 %
IL-6	51.5 %

Panadoxine™ P inhibited IL-8 & IL-6 from human skin keratinocyte by UV-B (30mJ/cm<sup>2</sup>). It was shown to reduce skin inflammation by UV.



Daiichi Fine Chemical data

Panadoxine™ P has a good efficacy in regulation of sebum production and in reduction of skin inflammation. Its efficacy provides mild and long-term regulation for daily skin care, especially for men.

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