

**WARNING !!!!**

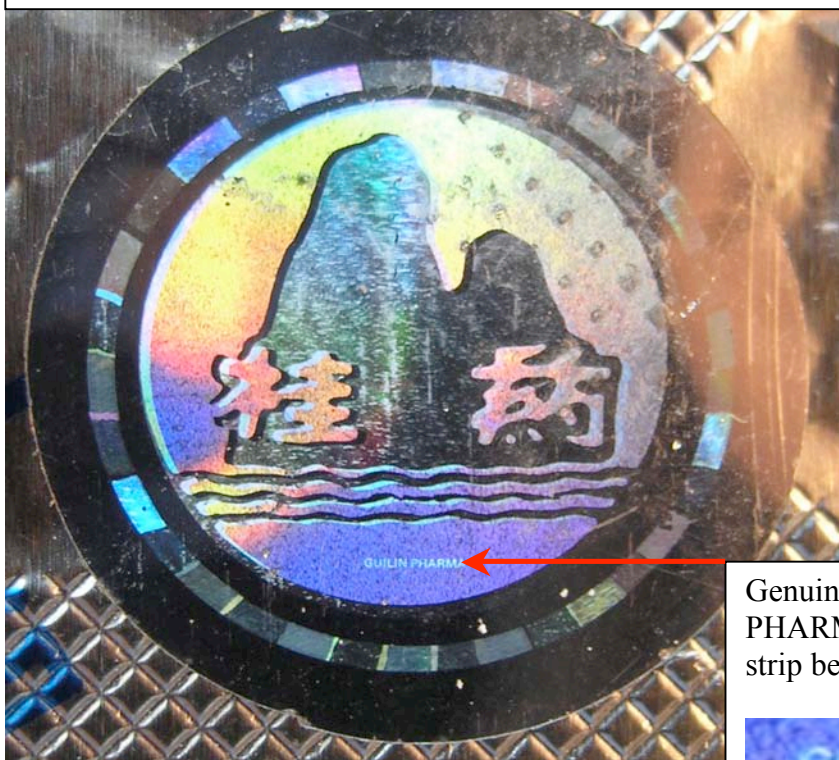
**July 2006: Edition No. 5**

**AT LEAST FOURTEEN DIFFERENT TYPES OF FAKE ARTESUNATE ARE BEING SOLD IN MAINLAND SOUTH EAST ASIA**

**HERE ARE SOME KEY FEATURES TO AID IDENTIFICATION OF FAKE 'GUILIN PHARMACEUTICAL CO, LTD' ARTESUNATE BLISTER PACK HOLOGRAMS**

**BLISTER PACKS WITH FAKE HOLOGRAMS CONTAIN NO OR INSUFFICIENT ARTESUNATE AND ARE THEREFORE POTENTIALLY LETHAL**

### Genuine 'Guilin Pharma' Hologram

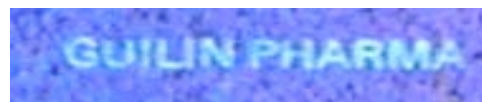


The photograph, left, is of the genuine hologram attached to the blister packs and packets of the genuine 'Guilin Pharmaceutical Co. Ltd' artesunate. Below are pictures of 13 types of fake artesunate stickers & holograms with their distinguishing features. As hologram colour depends on the light, please do not use the colours printed here to judge whether artesunate is genuine or fake



Genuine hologram under UV light with 'X-52' at mountain base

Genuine hologram has the legend 'GUILIN PHARMA' here. Visible with the naked eye, as a thin strip below the waves. Letters are ~ 0.1mm high



Guilin Pharmaceutical Co., Ltd. developed their hologram as a security device in response to the first type ('Type 1') of counterfeit artesunate circulated which had no hologram attached. As a result, any 'Guilin Pharmaceutical Co. Ltd' artesunate now circulating without a blister pack hologram is almost certainly counterfeit or expired. Subsequently, at least 13 different types of counterfeit 'Guilin Pharmaceutical Co. Ltd.' artesunate have been found in Southeast Asia [Burma (Myanmar), Cambodia, China, Lao PDR, Thailand (only on the western border) and Vietnam] with counterfeit stickers or holograms, and there are probably more types circulating. Counterfeit artesunate, but not the Guilin Pharmaceutical Co. Ltd' product, and dihydroartemisinin have recently been found in Africa.

Genuine and counterfeit holograms are ~ 13 mm in diameter. The genuine and 'Type 10' fake holograms have 'X-52' visible across the mountains when viewed under UV light.

Other features of the counterfeit artesunate, that differ from the genuine product, include – poor printing of bar codes on packets, poor printing of codes on blister packs, codes on blister packs printed with the font made of numerous small dots, poor stamping of code ‘AS’ and score line on tablets, raised edges of tablets, very hard tablets, blisterpack abbreviations in capital letters (‘MFG’ and ‘EXP’) and unusually late expiry date in relation to date of manufacture (> 3years). Counterfeits tend to be cheaper than the genuine product.

Counterfeit artesunate ‘Type 4’ and ‘Type 9’ contain small quantities of artesunate (~ 10mg), which will not be efficacious but may give misleading positive result on the Fast Red TR dye test and may facilitate the selection of artesunate-resistant malaria parasites.

**This update has been issued following the discovery of Types 13 and 14. Type 14 bears, for the first time, the ‘Myanmar Registration Number’**

Although, regrettably, the counterfeiters have targeted the ‘Guilin Pharmaceutical Co. Ltd’ product, it is possible that other fake artesunate products exist in Asia, as have been described in Africa. Therefore, drug regulatory authorities should be vigilant and regularly monitor the quality of artesunate available on the market. If you are uncertain as the authenticity of any artesunate sample based on the characteristics of the packaging, please check by chemical analysis of the tablet (eg see <http://www.cdc.gov/malaria/travel/test.htm>)

Wellcome Trust Oxford SE Asian Tropical Medicine Research Units: 5<sup>th</sup> edition  
Compiled by Paul Newton 24<sup>th</sup> July 2006

With very many thanks to the numerous people who assisted with this project, particularly Facundo Fernandez (Georgia Tech) and Mike Green (CDC) for chemical analysis, David Pizzanelli for advice on holograms and the many people who have collected samples.

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[http://www.jr2.ox.ac.uk/ndm/Tropical\\_Medicine/News.htm](http://www.jr2.ox.ac.uk/ndm/Tropical_Medicine/News.htm)

## **Counterfeit Artesunate – Type 1**

Does not bear a sticker or hologram and does not come with a packet. Poor printing of expiry dates and codes on the blisterpack

## Counterfeit Artesunate – Type 2



A foil sticker. Not a true hologram; dull, not diffractive when tilted in the light. Not well crafted. 'Artesunate Tablet' printed on blisterpack

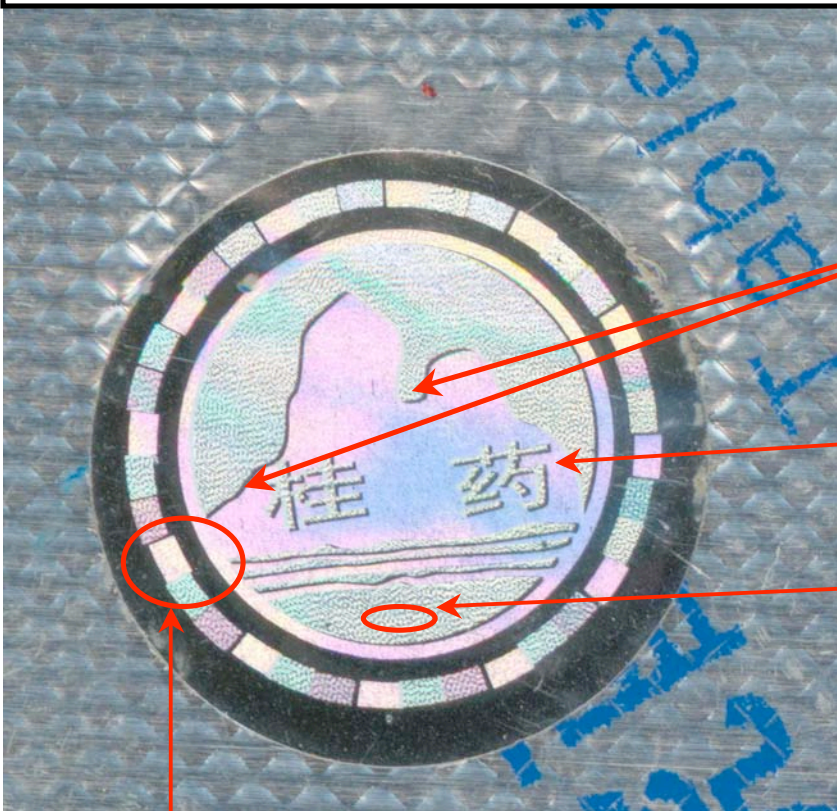
**Grey outer ring**

**Inner ring rectangles do not vary in colour**

**No 'Guilin Pharma' legend**

Blister packs seen with this fake sticker are printed with batch numbers 970901, 980201 or 980502.

## Counterfeit Artesunate – Type 3



A hologram, but lacks the Guilin Pharma legend below the waves and the mountain outline differs. The left slope of the mountain meets the ring. The printing on the blister pack is not clear. 'Artesunate Tablet' printed on blisterpack

**Mountain outline differs**

**Pictogram made of straight bars**

**No 'Guilin Pharma' legend**

Blister packs seen with this fake hologram are printed with batch number 000902

**Ring 'blocks' out of alignment**

## Counterfeit Artesunate – Type 4



Ring 'blocks' out of alignment

A hologram – mountain outline similar to that on the genuine hologram, but lacks the 'Guilin Pharma' legend below the waves. The printing on the blisterpack is clear. 'Artesunate Tablet', 'Artesunate Tablets' or 'Artesunate Tablte' (see below) printed on blisterpack.

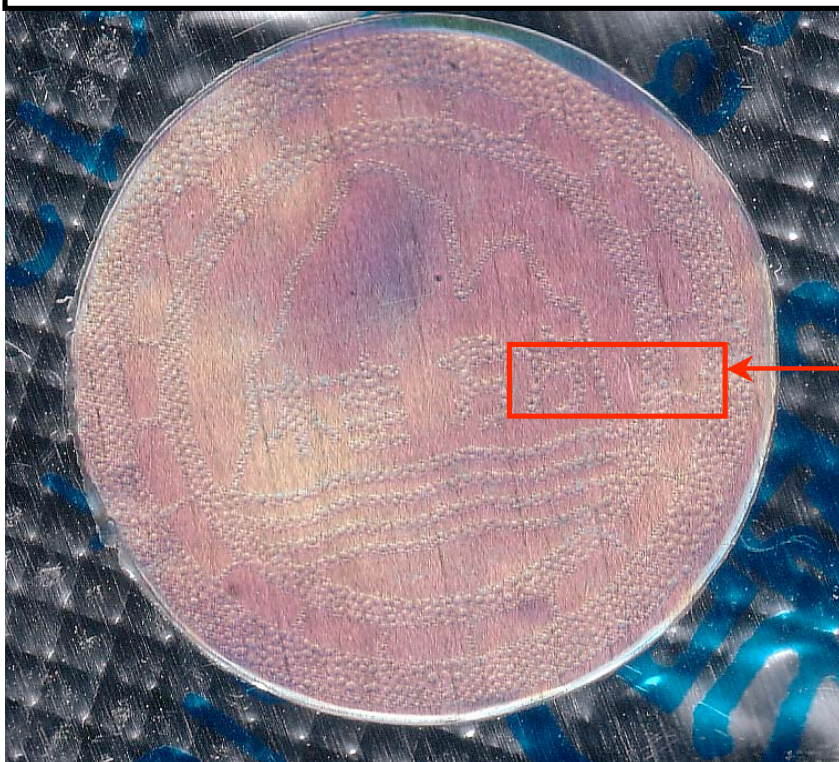
Traces of artesunate found in tablets



No 'Guilin Pharma' legend

Blister packs seen with this fake hologram are printed with batch numbers 010901, 021001 or 020305.

## Counterfeit Artesunate – Type 5



Foil sticker, not a hologram, with pattern composed of thousands of dots copying the genuine Guilin Pharma artesunate hologram pattern. Easily distinguished. 'Artesunate Tablet' printed on blisterpack



Blister packs seen with this fake sticker are printed with batch number 010401.

## Counterfeit Artesunate – Type 6



Well crafted hologram - but the junction between the mountains and the waves differs from that depicted on the genuine hologram. There is an indistinct legend to the right of centre, beneath the waves

Crescents, rather than a continuous blank line, between mountain and waves

Indistinct writing below waves, ending in '...MA', to the right of centre

Blister packs seen with this fake hologram are printed with batch numbers 030101 and 010101

Ring 'blocks' out of alignment

## Counterfeit Artesunate – Type 7



Well crafted hologram - with 'GUILIN PHARMA' written below the waves but in an abnormally large font

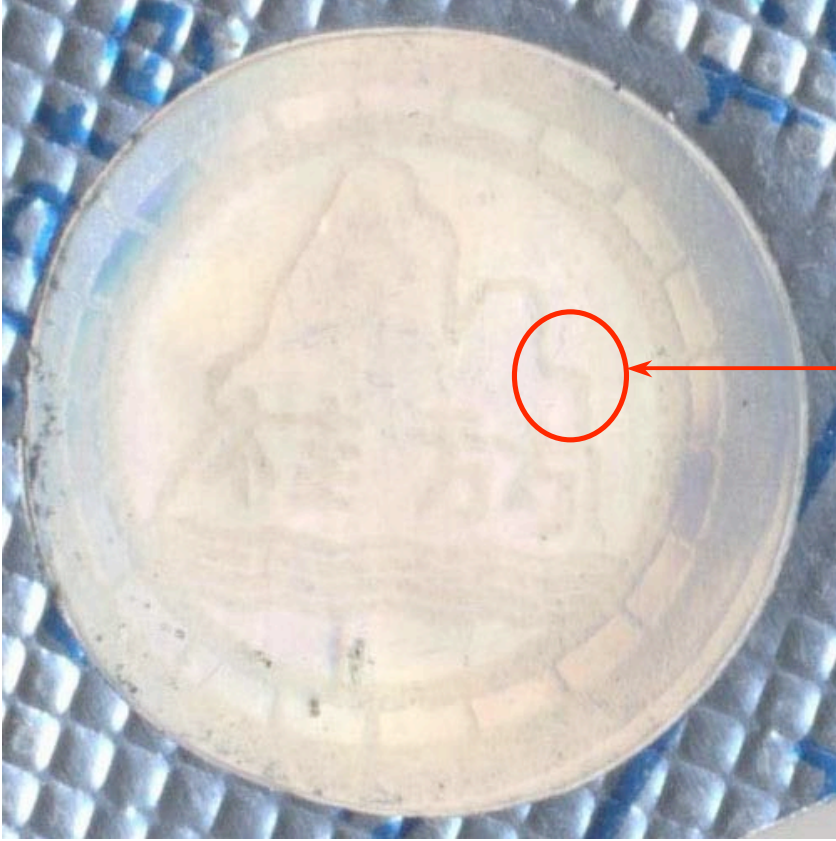
'Guilin Pharma' legend present but the letters are of larger font than those on the genuine hologram and can be read with the naked eye. Letters are ~ 0.3 mm high.



Ring 'blocks' out of alignment

Blister packs seen with this fake hologram are printed with batch number 000801. Date of expiry is normally 3 years after date of manufacture. This type has an abnormally long lifetime of nine years

## Counterfeit Artesunate – Type 8



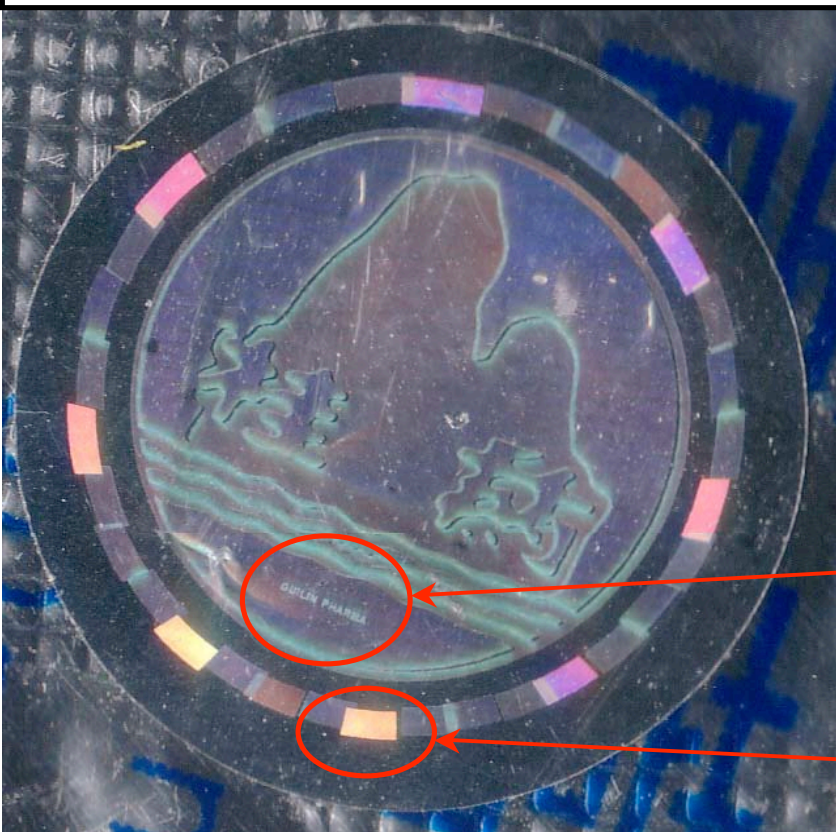
Sticker - similar to 'Type 2' but with 'plateau' on right side of mountain outline and a very acute angle between the two mountain peaks. 'Artesunate Tablet' printed on blisterpack

Plateau

Blister packs seen with this fake sticker are printed with batch numbers 980201, 010401 or 040201.

Some have manufacture and expiry abbreviations printed in capitals 'MFG' and 'EXP' in contrast to the genuine product which uses 'Mfg' and 'Exp'.

## Counterfeit Artesunate – Type 9



Well crafted hologram, similar to 'Type 7' but Guilin Pharma legend below waves is in a smaller font, similar to the font on the genuine product. 'Artesunate Tablets' printed on the blisterpack.

Traces of artesunate found in tablets

Blister packs seen with this fake hologram are printed with batch number 040101, 4010 or 040502

'Guilin Pharma' legend

Ring 'blocks' out of alignment

## Counterfeit Artesunate – Type 10



Ring 'blocks' out of alignment

Well crafted hologram, similar to 'Type 4', but has 'X-52' visible under UV light on hologram (see below). The 'X-52' is however stamped across the middle, rather than the base, of the mountains. 'Artesunate Tablets' printed on blisterpack.



No Guilin Pharma legend

Blister packs seen with this fake hologram are printed with batch number 040301

## Counterfeit Artesunate – Type 11



Sticker, similar to 'Type 2' and 'Type 8' but mountain outline differs and poorly manufactured. 'Artesunate Tablet' printed on blisterpack.

Blister packs seen with this fake sticker are printed with batch numbers 010401, 020402, 030301

Manufacture and expiry abbreviations are printed in capitals 'MFG' and 'EXP' in contrast to the genuine product which uses 'Mfg' and 'Exp'.

## Counterfeit Artesunate – Type 12

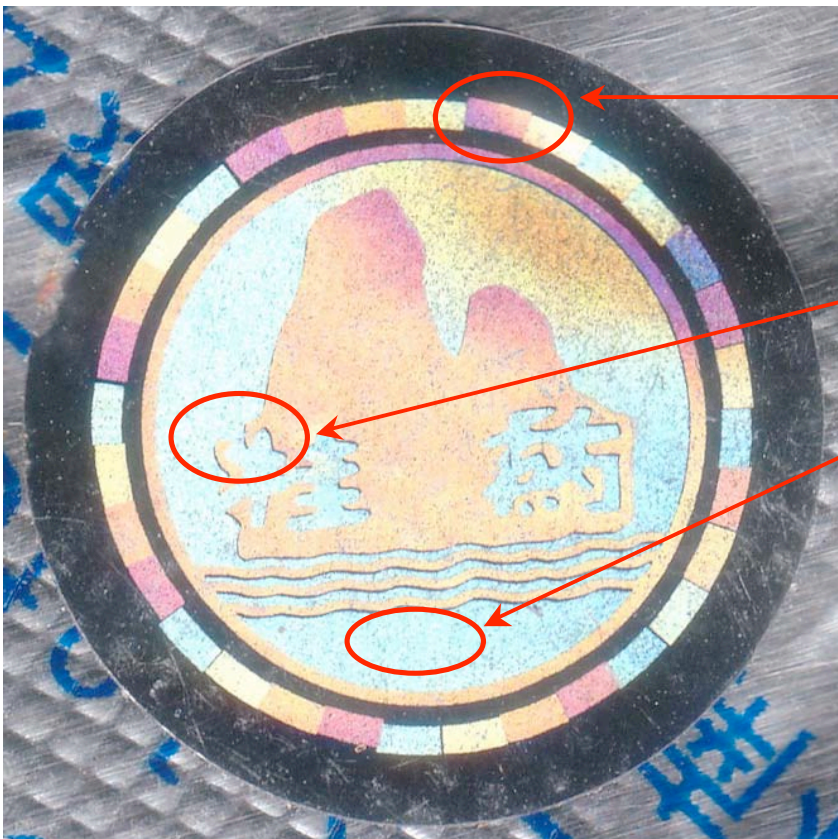


Sticker, with similar mountain outline to 'Type 8' and 'Type 11' but with a grid of large dots and a 'cloth' like appearance 'Artesunate Tablets' printed on blisterpack.

Blister packs seen with this fake sticker are printed with batch number 040201.

Manufacture and expiry abbreviations are printed in capitals 'MFG' and 'EXP' in contrast to the genuine product which uses 'Mfg' and 'Exp'.

## Counterfeit Artesunate – Type 13



Hologram, with similar mountain outline to 'Type 4' and 'Type 9' but with a different pictograms and outer circle. 'Artesunate Tablets' printed on blisterpack.

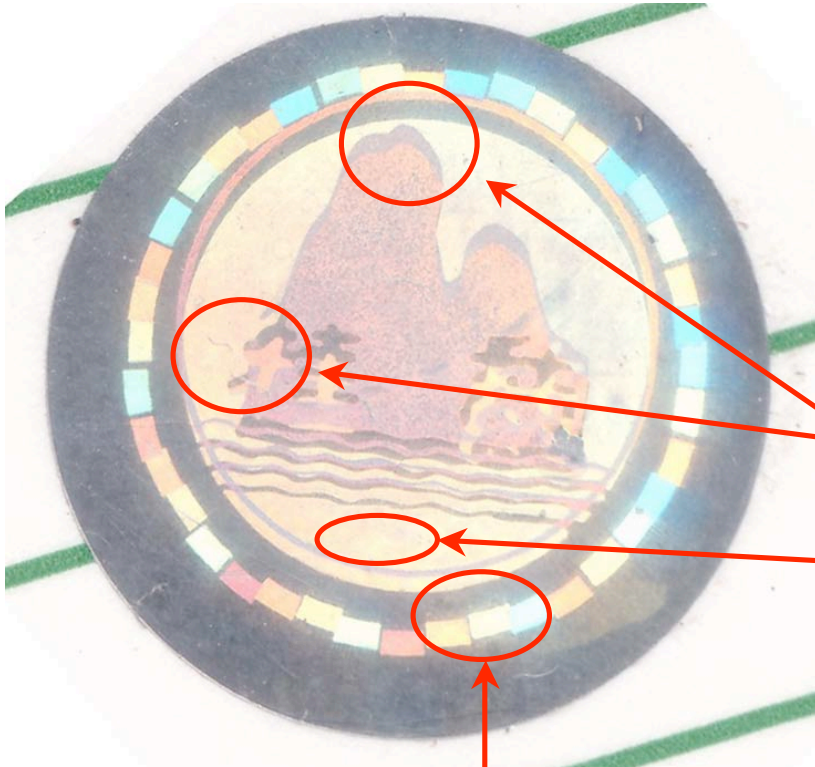
Ring 'blocks' out of alignment

Pictograms differ

No Guilin Pharma legend

Blister packs seen with this fake hologram are printed with batch number 04010.

# Counterfeit Artesunate – Type 14



Hologram with misalignment. The inner and outer circles are misaligned and two protuberances from the left pictogram

This counterfeit, from Burma, has the 'Myanmar Reg No' on blisterpack and packet and the foil of the blisterpack is gold, rather than silver. The genuine Guilin Pharmaceutical Co. Ltd product in Burma has gold foil.

Hologram out of alignment, especially noticeable with mountains, pictograms and circles

No Guilin Pharma legend

Ring 'blocks' out of alignment

Blister packs seen with this fake hologram are poorly printed with batch number 050701.



Type 14 counterfeit hologram

Extra space between 'E' & 'S'

Copies of genuine Myanmar Reg No and Agent's name

This counterfeit packet is not reliably distinguishable, with the naked eye, from the genuine packet. The 'Myanmar Reg No' and agent's name have been added to look like the genuine Guilin Pharmaceutical Co. Ltd product sold in Burma.

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