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## INDUSTRY OVERVIEW

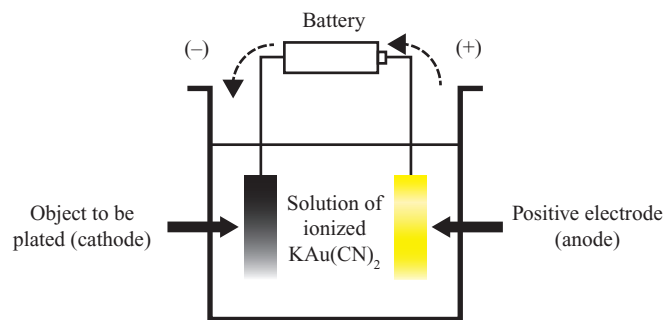
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*The information presented in this section is derived from various private and/or publicly available documents. The information has not been prepared or independently verified by the Company, OGH, JS Cresvale, Kingsway Capital or any of their respective advisers or affiliates.*

### INTRODUCTION

Electroplating is a process by which a thin layer of metal is deposited over an object by applying an electric current while the object is submerged in a solution of chemicals and metal salts. At the end of the process, the plated object acquires an elegant and glamorous surface which protects the object from corrosion.

The following diagram illustrates the electroplating process in its simplest form. A “cathode” and an “anode” are placed in a non-metallic tank filled with electrolyte – an aqueous acid or alkaline solution containing metal salts in their ionized, or chemically-decomposed form (such a process tank is called the “electrolytic bath”). The cathode is the metal surface to be plated and is negatively-charged. The anode is a positively-charged electrode or metal medium. Applying a low voltage direct current, metal salt ions in the electrolyte are attracted to the negatively charged cathode and deposited thereon. To “balance out” the outflowing ionic composition, metal on the anode is decomposed and dissolved into the electrolyte. In other words, plating is an oxidation-reduction reaction, where one material gives up electrons (becomes oxidized) and the other material gains electrons. The anode is the electrode at which oxidation occurs, and the cathode is the electrode at which reduction occurs. Various substances (such as auxiliaries) are added to the electrolytic bath to enhance the smoothness and brightness of the metal deposit. Sometimes, objects are coated with two or more layers of different metals.



Because of the attractive attributes created by precious metals electroplating, electroplating is used where there is a demand for an attractive outer finish, plated items include clocks, watches, jewellery, fashion accessories and other products of decorative natures. Electroplating is also applied in the manufacture of electronic components and parts for industrial equipment in order to alter and improve certain physical characteristics of the plated object. For example, a poor conductor can become a good conductor after being electroplated.

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### THE USAGE OF ELECTROPLATING

#### Gold plating

Today's decorative gold plating processes are applied to a very diverse range of consumer products. Typically, plated items include watch cases and bands, plumbing fixtures, writing instruments, jewellery, eyeglass frames, cigarette lighters, fashion accessories and light fixtures. The thickness of deposits varies with the manufacturers' specifications and applications. Gold deposits for such diverse applications are obtained from chemicals that are segmented into various types including hard acid gold, alkaline non-cyanide gold, alloy gold plating, alkaline cyanide gold and neutral cyanide gold. Gold Salts manufactured and traded by the Group can be used in the last two of the above types of electroplating procedures.

Alkaline cyanide gold and neutral cyanide gold systems have been associated with creating the widest colour range of plated gold. Over six hundred shades of colours have been plated since the early twentieth century. The formulations, based on potassium gold cyanide alone or with colouring additives, are extremely versatile, offering the ability to form deposits of all tones and levels of thickness.

According to the World Gold Council, the production of plating salts accounts for 70% of the more than 150 tonnes of gold used annually in electronics. Although new technology has enabled plating thickness to be pared down to less than one thousandth of a millimeter of gold, gold consumption has been maintained because of the myriad new electronic applications. Gold's other main role in electronics is in semiconductor devices, where fine gold wire or strips are used to connect parts such as transistors and integrated circuits and in printed circuit boards to link components.

#### Silver Plating

Silver plating, as mentioned above, is as old as the plating industry itself. It was first patented in Britain in 1840 by the Elkington cousins. The basic plating process has changed little since then, with only slight recent developments in decorative applications involving the addition of brighteners. Bright metal deposits reduce or eliminate the cost of polishing.

The major use of Silver Salt is in the decorative plating of silver cutlery, flatware and hollowware. The other prevalent use is in the electronics industry where large amount of silver are plated onto conductors, connectors, contacts and similar items because of silver's high level of electrical conductivity. In addition, bright silver plating on fashion jewellery as well as candlesticks are also an important application of potassium silver cyanide.

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### **Palladium and Palladium Alloys**

Palladium and palladium alloys are beginning to be used more extensively in the jewellery industry and other decorative precious metal applications. Their key features of low porosity and bright white appearance are used to enhance the appeal of many decorative items.

Palladium Salt is the most common formulation used for palladium and palladium-nickel alloy plating. Palladium-nickel alloy is hard and of white colour with good corrosion resistance. They are suitable for spectacle frames and writing utensils. Pure palladium and palladium-nickel alloy deposits are also used to substitute nickel as a diffusion barrier below a final gold flash on spectacle frames, fashion jewellery, watches and buttons. Sandwich layers of nickel, palladium or palladium/nickel alloy and gold flash have proved their applicability on printed circuits and connectors as substitutes for hard gold layers. Recently, many additional applications have been found including contact finishing for edge card connectors, lead frames for IC packaging, solderable contact and end terminations for multi-layered ceramic capacitors, semiconductor optoelectronic devices for packing, etch resists for printed wire boards, battery parts, and decorative items for jewellery and consumer hardware.

### **Rhodium Plating**

Of all other members in its category, which includes platinum, rhodium has found the widest acceptance in decorative precious metals applications. Rhodium has several desirable properties – it is brilliant white in colour, high in reflectivity and has a hardness which makes it very popular in the genuine and faux jewellery industries alike. Rhodium provides an excellent tarnish protection for sterling silver or silver plated flatware and hollowware, even with quite thin deposits.

## **THE MARKET FOR ELECTROPLATING CHEMICALS**

According to the research conducted by Hong Kong Productivity Council in October 2002, the estimated annual usage of Electroplating Chemicals in Hong Kong and the Pearl River Delta Region is set out as follows:

### **The estimated annual usage of Electroplating Chemicals in Hong Kong and the Pearl River Delta Region**

	<i>Kg</i>
Gold Salt	60,000
Silver Salt	120,000
Palladium Salt	15,000
Rhodium Sulphate	2,730

*Source:* The Hong Kong Productivity Council, October 2002.

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### The demand

Being the essential components of the electroplating process, the demand for Electroplating Chemicals is highly correlated to the business development of the electroplating service providers and end-user industries whose production involves the electroplating process.

In order to appraise the market potential of Electroplating Chemicals in the PRC and Hong Kong, it is appropriate to evaluate the business development of several industries that consume Electroplating Chemicals in their production process.

#### 1) *Watches and Clocks*

##### The major exporters of watches and clocks from 1996-2000

(US\$'000)

Country	1996	1997	1998	1999	2000
Switzerland	6,192,264	5,734,930	5,822,961	5,988,607	6,172,633
China	1,963,675	2,043,900	1,981,757	1,850,605	1,831,273
Japan	1,878,599	1,832,284	1,619,630	1,469,627	1,400,558
Germany	742,545	695,902	700,863	697,737	659,518
Hong Kong	1,549,862	1,394,760	1,153,782	649,638	386,492

Source: The United Nations Statistics Division

### Hong Kong

According to the statistics from the United Nations, Hong Kong was one of the leading exporters of watches and clocks in the world from 1996 to 2000. Apart from watches and clocks, Hong Kong also exports a variety of parts and components, such as assembled movements, cases, watch straps, dials and parts for watch cases and bands. Strong ancillary and supporting industries have been established for Hong Kong's watches and clocks manufacturing.

In view of severe competition, an increasing number of manufacturers have relocated their labour intensive processes to China for cost savings. However, a number of manufacturers still maintain their production bases for higher value products in Hong Kong.

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### China

China was the second largest exporter of watches and clocks in 2000 and a promising market for watches and clocks. According to the Hong Kong Trade Development Council, in 2001, the annual sales of wrist-watches in the PRC reached 60,000,000.

## 2) Jewellery

### Hong Kong

#### Performance of Hong Kong's Jewellery Exports

	2000		2001		Jan - Oct 2002	
	Value (HK\$ mn)	Growth (%)	Value (HK\$ mn)	Growth (%)	Value (HK\$ mn)	Growth (%)
<b>Precious Jewellery</b>						
Domestic Exports	5,553	+16	4,619	-17	4,256	+10
Re-Exports	7,172	+41	7,720	+8	7,625	+24
Total Exports	<u>12,725</u>	+29	<u>12,339</u>	-3	<u>11,881</u>	+18
<b>Imitation Jewellery</b>						
Domestic Exports	167	-34	117	-30	53	-47
Re-Exports	3,693	+16	3,738	+1	3,375	+8
Total Exports	<u>3,860</u>	+13	<u>3,855</u>	-0.1	<u>3,428</u>	+6

Source: The Hong Kong Trade Development Council, 7 January 2003

Similar to the watches and clocks industry, Hong Kong was also one of the leading exporters in the global jewellery industry. According to the Hong Kong Trade Development Council, combined with re-exports, Hong Kong is the leading exporter of imitation jewellery and the fourth largest exporter of precious jewellery in the world.

Hong Kong has a highly skilled and productive labour force capable of handling small orders and making elaborate designs at reasonable prices. The overall technology level of the precious jewellery industry is perceived by manufacturers to be above competitors like Thailand but below the world leaders such as Italy and Japan. In particular, Hong Kong has a leading position in the production of pure gold items.

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After levelling off in 1997 and 1998, exports of precious jewellery grew by 25% in 1999, and by another 29% in 2000. Since 2001, the global economic slowdown has however dragged down the export performance of Hong Kong to post a drop of 2% in the first eleven months of 2001. Exports of imitation jewellery grew modestly by 1% in the first eleven months of 2001, after two consecutive years of double-digit growth in 1999 and 2000.

### China

The jewellery market of China experienced remarkable growth in the last decade. According to the Hong Kong Trade Development Council, total sales increased from RMB 24 billion in 1991 to RMB 89 billion in 2000, at a compound annual growth rate of approximately 16%. As a result of economic growth in the PRC, and continually improving living standards of people in the PRC, it is expected that jewellery ownership will increase further, and the growth potential of jewellery market is enormous. The Directors believe that the growing demand for jewellery will indirectly boost demand for Electroplating Chemicals.

### 3) Printed circuit boards ( the “PCB”)

#### Global printed circuit board production

	2000 (US\$m)	2001P (US\$m)	2005E (US\$m)	5-yr CAGR (%)
North America	10,630	8,950	12,525	3.3
South America	230	240	295	5.1
Western Europe	5,354	5,100	6,200	3
<b>Asia</b>	<b>24,917</b>	<b>25,370</b>	<b>33,450</b>	<b>6.1</b>
Japan	12,190	12,120	13,750	2.4
Taiwan	4,600	4,970	6,710	7.8
<b>China</b>	<b>3,635</b>	<b>4,030</b>	<b>7,350</b>	<b>15.1</b>
Korea	2,053	2,125	2,890	7.1
Other	2,439	2,125	2,750	2.4
Others	675	660	780	2.9
<b>TOTAL</b>	<b>41,806</b>	<b>40,320</b>	<b>53,250</b>	<b>5</b>
<b>China portion (%)</b>	<b>8.7</b>	<b>10</b>	<b>13.8</b>	

Source: N.T. Information

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According to N.T. Information, a PCB industry research institute, PCB production in China is expected to increase 15% per annum to US\$7.4 billion in 2005, compared with a 5% per annum predicted growth rate of the global production. As a result, the production in China will account for 13.8% per annum of global production in 2005.

As fine gold wire or strips are consumed during the production of PCB, the Directors believe that the growth of the PBC industry in the PRC will boost the demand for Electroplating Chemicals.

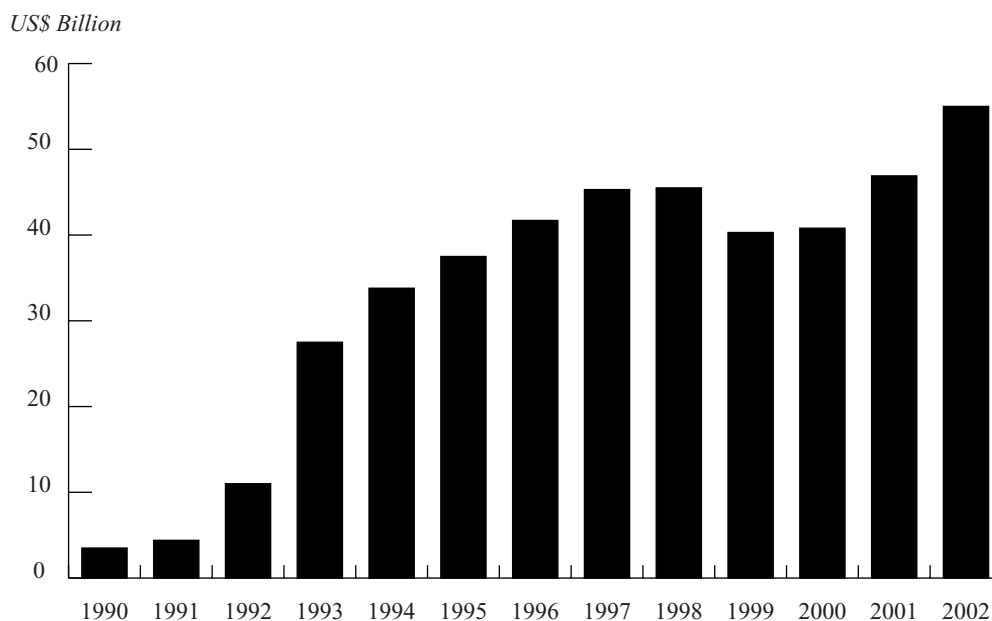
#### **4) *Other favourable factors to the demand of Electroplating Chemicals***

Furthermore, the Directors consider that the demand for Electroplating Chemicals in the PRC and Hong Kong will continue to grow over the next few decades because of the following favourable business environment and development trends.

– *The impact of globalisation*

Amid the trend of globalisation, the cost advantages of the PRC have attracted substantial foreign direct investment to establish factories in the PRC. The amount of foreign direct investment increased from US\$40.4 billion in 1999 to US\$55.0 billion in 2002. A large portion of these foreign direct investments invested in labour-intensive light industries, including the production of watches and clocks, jewellery, fashion accessories and eyeglass frames, which all use Electroplating Chemicals in their production processes. Therefore, the Directors believe that the steady growth of these industries in the PRC will develop a favourable market for Electroplating Chemicals.

### Foreign Direct Investment actually utilised



Source: (1) China State Statistics Bureau  
(2) Foreign Investment Department of MOFTEC

### The Supply

Currently, there are only a few Electroplating Chemicals suppliers in Hong Kong. Among these active suppliers, the Directors believe that three of them have production capacity in Hong Kong.

Similar to Hong Kong, the supply of Electroplating Chemicals in the Pearl River Delta region is dominated by a few overseas manufacturers such as Switzerland and U.K. As far as the Directors are aware, there are less than ten manufacturers of Electroplating Chemicals in the PRC and their supplies account for an insignificant proportion of the supply of Electroplating Chemicals in the Pearl River Delta region which may be due to the PRC's taxation system and controlled gold policy.

The Directors believe the above-mentioned features of the supply of Electroplating Chemicals in the PRC and Hong Kong offer a favourable business environment for the Group's development because of the following reasons:

1. *Cost advantages and flexibility as compared with the overseas manufacturers*

- The Group is one of the few manufacturers of Electroplating Chemicals with production facilities in both Hong Kong and the PRC. As compared with overseas manufacturers, the Group enjoys lower transportation cost arising from local production. In addition, the Group can maintain a



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flexible inventory management and product delivery system because of the local production facilities established in the PRC and Hong Kong.

### 2. *Barriers to entry*

- Owing to its specific usage, Electroplating Chemicals have precise requirements in terms of composition, precious metal content and purity level. Therefore, the production technology employed must be advanced and reliable and accordingly the production process must be monitored by qualified and experienced technical staff.
- The production of Electroplating Chemicals involves the use of dangerous substances including toxic and corrosive chemicals which are regulated by relevant safety and environmental-protection laws and regulations. Newcomers must invest significant resources to develop the control system for safeguarding against leakage and mishandling of dangerous substances and ensuring that the production of Electroplating Chemicals comply with the environmental-protection laws and regulations.
- The establishment of production facilities for Electroplating Chemicals requires considerable capital investment. Furthermore, using precious metals as raw materials requires high working capital to maintain adequate day-to-day inventory.

### 3. *Established reputation in the industry*

- Since electroplating is the final surface-finishing process of a product, even the smallest defect in plating would be highly conspicuous and has great impact on the attractiveness and marketability of the finished goods. As such, electroplating service providers are reluctant to switch away from a brand name which they have experience of and in which their confidence have been built. According to Hip Cheong Hong Ltd., a precious metals consultant in Hong Kong, the brand name of the Group, Kenlap, is a well-known brand name in the industry. The Directors consider that Kenlap's established brand name will assist the Group in expanding its business in the PRC and Hong Kong.

## PRECIOUS METALS SUPPLY

### Gold

In the PRC, the import and export of gold is still being controlled by the State. Pursuant to the prevailing regulations, the import and export of gold and gold-plated products are subject to the approval of a state-owned bank, the People's Bank of China ("PBC"). Gold Salt

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manufacturers have to obtain allocation of gold resources from the PBC. Foreign-owned enterprises, including the Group, are required to make an application to PBC for approval to acquire gold resources. Subject to import regulations, these enterprises may process materials imported from foreign countries. Finished products other than those manufactured by local companies cannot be sold in the country and must be exported.

### **Silver**

China has rich silver mineral reserves and is a major producer of silver. Since January 2000, the trading of silver no longer requires the approval of, nor is it subject to, quota restrictions of the PBC or the PRC government.

### **Palladium**

Similar to silver, the trading of palladium is not regulated by the State. In China, palladium is usually imported from Russia, or recovered from exhaust pipes of waste vehicles from the rest of the world. The palladium so obtained will then be refined to become palladium powder which can be used in producing Palladium Salt.

### **Rhodium**

Rhodium is a very expensive metal with a market value roughly double that of gold. Its trading, unlike gold, is not regulated or controlled by the State.

## **LAWS AND REGULATIONS**

### **Hong Kong**

#### *Dangerous Goods Ordinance (Chapter 295 of the laws of Hong Kong)*

Under section 6 of the Dangerous Goods Ordinance, except under and in accordance with a licence granted under that ordinance, no person shall manufacture, store, convey or use any dangerous goods. As confirmed by the Fire Services Department, under the Dangerous Goods (Application and Exemption) Regulations (Chapter 295, sub. leg. A of the laws of Hong Kong), potassium dicyanoaurate is classified as Category 4 dangerous goods with an exempted quantity of 5 kg.

Accordingly, a licence from the Fire Services License Authority is not required if the Group does not keep inventory of potassium dicyanoaurate in excess of 5 kg in its premises.

Under section 14 of the Dangerous Goods Ordinance, any person who contravenes section 6 of that ordinance shall be guilty of an offence and shall be liable to a fine of HK\$25,000 and to imprisonment for six months.

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The Group has obtained a license to manufacture Gold Salt from the Fire Services License Authority. As confirmed by the Directors, inventory of Gold Salt will also be kept at a level of less than 5 kg. In order to prepare for future expansion, the Group has taken steps to apply for a licence for the storage of Gold Salt and potassium dicyanoaurate.

*Factory and Industrial Undertakings (Dangerous Substance) Regulations (Chapter 59 sub. leg. AB of the laws of Hong Kong)*

The Factories and Industrial Undertakings (Dangerous Substances) Regulations (Chapter 59AB) governs the handling of dangerous substances, including Gold Salt, in Hong Kong. For example, proper labeling is required and necessary training procedures in the handling of such dangerous substances are required to be provided to the relevant employees.

### THE PRC

### ENVIRONMENTAL PROTECTION LAWS AND REGULATIONS

Environmental protection in the PRC is principally governed by the “People’s Republic of China Environmental Protection Law” (《中華人民共和國環境保護法》), which was enacted by the PRC National People’s Congress Standing Committee (全國人大常委會) on 26 December 1989. Under this Act, the Environmental Protection Administrations Department under the State Council (國務院環境保護行政主管部門) would be responsible for the overall regulation and management of environmental protection in the PRC, while the various Provincial Environmental Protection Administrations Departments are delegated the power to regulate and manage the environmental protection of the relevant provinces.

The construction of facilities which emit and/or generate pollution in the Guangdong Province are governed by the “Guangdong Province Construction Projects Environmental Protection Management Regulation” (廣東省建設項目環境保護管理條例) which was passed by the Guangdong Province People’s Congress Standing Committee (廣東省人大常委會) on July 6, 1994 and amended on September 2, 1997. Under this regulation, the construction of facilities which emit and/or generate pollution must follow the standards set by the State and the relevant local governments. In particular, construction of facilities which may affect the environment is required to file a report which contains an analysis and estimation on the effect of such facilities on the environment. Construction of facilities which have insignificant effect on the environment would only be required to file the environmental effect registration form and is not obliged to commence analysis on the estimated effect(s) of such facilities to the environment. Penalties for non-compliance with this regulation include various levels of monetary fines and/or termination of construction.