



**Australian Government**  
**Anti-Dumping Commission**

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## **Exporter Questionnaire**

**Product: POWER TRANSFORMERS**

**From:** China, Indonesia, Korea, Taiwan, Thailand and Vietnam

**Period of Investigation:** 1 July 2010 – 30 June 2013

**Response due by: 16 October 2013**

**Investigation case manager:** Chris Vincent

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**Anti-Dumping Commission website:** [www.adcommission.gov.au](http://www.adcommission.gov.au)

**Return completed  
questionnaire to:**

Anti-Dumping Commission  
Customs House  
5 Constitution Avenue  
Canberra ACT 2600

Attention: Director Operations 1

## SECTION A

### COMPANY STRUCTURE AND OPERATIONS

This section requests information relating to company details and financial reports.

#### A-1 Identity and communication

Please nominate a person within your company who can be contacted for the purposes of this investigation:

*Head Office:*

Name: Sang-Kook Lee  
Position in Hyosung: General Manager  
Address: 450, Gongdeok-Dong, Mapo-Gu,  
Seoul, Korea. (121-720)  
Telephone: +82-2-707-6650  
Facsimile number: +82-2-707-6777  
E-mail address of contact person: sangkooklee@Hyosung.com

*Factory:*

Address: 454-2 Nae-dong, Changwon,  
Gyeongsangnam-do, Korea  
Telephone: +82-55-268-9029  
Facsimile number:  
E-mail address of contact person: sangkooklee@Hyosung.com

#### A-2 Representative of Hyosung for the purpose of investigation

If you wish to appoint a representative to assist you in this investigation, provide the following details:

Name: Andrew Hudson  
Address: Level 26, 385 Bourke Street  
Melbourne VIC 3001  
Telephone: +61 3 8602 9231  
Facsimile/Telex number: +61 3 8602 9299  
E-mail address of contact person: ahudson@hunthunt.com.au

*Note that in nominating a representative, the Commission will assume that confidential material relating to your company in this investigation may be freely released to, or discussed with, that representative.*

**A-3 Company information**

1. What is the legal name of your business? What kind of entity is it (eg. company, partnership, sole trader)? Please provide details of any other business names that you use to export and/or sell goods.

<Answer>

Hyosung Corporation (hereinafter, "Hyosung") is a listed public company whose shares are traded on the Korea Exchange.

2. Who are the owners and/or principal shareholders? Provide details of shareholding percentages for joint owners and/or principal shareholders. (List all shareholders able to cast, or control the casting of, 5% or more of the maximum amount of votes that could be cast at a general meeting of your company).

<Answer>

Hyosung has provided details of shareholding percentages for joint owners and/or principal shareholders in the Exhibit A-3.2.

3. If your company is a subsidiary of another company, list the principal shareholders of that company.

<Answer>

Hyosung is not a subsidiary of another company.

4. If your parent company is a subsidiary of another company, list the principal shareholders of that company.

<Answer>

Hyosung does not have a parent company.

5. Provide a diagram showing all associated or affiliated companies and your company's place within that corporate structure.

<Answer>

Hyosung has provided a diagram showing all associated or affiliated companies and its place within that corporate structure in the Confidential Exhibit A-3.5(a) and Confidential Exhibit A-3.5(b)

6. Are any management fees/corporate allocations charged to your company by your parent or related company?

<Answer>

There are no management fees/corporate allocations charged to Hyosung by related company.

7. Describe the nature of your company's business. Explain whether you are a producer or manufacturer, distributor, trading company, etc.

<Answer>

Hyosung is the manufacturer of the goods under consideration, it sells in the Korean domestic market and exports to Australia and to countries other than Australia.

8. If your business does not perform all of the following functions in relation to the goods under consideration, then please provide names and addresses of the companies which perform each function:

- produce or manufacture
- sell in the domestic market
- export to Australia, and
- export to countries other than Australia.

<Answer>

Hyosung is the manufacturer of the goods under consideration, it sells in the Korean domestic market and exports to Australia and to countries other than Australia.

9. Provide your company's internal organisation chart. Describe the functions performed by each group within the organisation.

<Answer>

Hyosung has provided an internal organisation chart in the Confidential Exhibit A-3.9.

10. Provide a copy of your most recent annual report together with any relevant brochures or pamphlets on your business activities.

<Answer>

Hyosung has provided the most recent annual report together with brochures in the Exhibit A-3.10(a) and Exhibit A-3.10(b).

#### **A-4 General accounting/administration information**

1. Indicate your accounting period.

<Answer>

The accounting period of Hyosung is a calendar year.

2. Indicate the address where Hyosung's financial records are held.

<Answer>

Hyosung maintains its books and records at its head office in Seoul. The address of Hyosung's head office is as follows:

**450, Gongdeok-Dong, Mapo-Gu, Seoul, Korea. (121-720)**



## PUBLIC RECORD

11

3. Please provide the following financial documents for the two most recently completed financial years plus all subsequent monthly, quarterly or half yearly statements:

- chart of accounts;

<Answer>

Hyosung has provided charts of accounts in the **Confidential Exhibit A-4.3(a)**.

- audited consolidated and unconsolidated financial statements (including all footnotes and the auditor's opinion);

<Answer>

Hyosung has provided audited consolidated and unconsolidated financial statements for the two most recently completed financial years (fiscal years 2011 & 2012) in the **Confidential Exhibit A-4.3(b)**.

- internal financial statements, income statements (profit and loss reports), or management accounts, that are prepared and maintained in the normal course of business for the goods under consideration.

<Answer>

Hyosung has no any other internal financial statements, income statements (profit and loss reports), or management accounts, which are not included in the audited financial statements.

These documents should relate to:

- the division or section/s of your business responsible for the production and sale of the goods under consideration, and
- Hyosung.

4. If you are not required to have the accounts audited, provide the unaudited financial statements for the two most recently completed financial years, together with your taxation returns. Any subsequent monthly, quarterly or half yearly statements should also be provided.

<Answer>

Hyosung has provided audited consolidated and unconsolidated financial statements for the two most recently completed financial years in the **Confidential Exhibit A-4.3(b)**.

5. Do your accounting practices differ in any way from the generally accepted accounting principles in your country? If so, provide details.

<Answer>

Hyosung maintains its books and records in accordance with Generally Accepted Accounting Principles ("K-IFRS") in Korea.

## 6. Describe:

The significant accounting policies that govern your system of accounting, in particular:

<Answer>

Hyosung maintains its books and records in accordance with K-IFRS in Korea. Please see the Notes to the audited financial statements provided in the **Confidential Exhibit A-4.3(b)**.

- the method of valuation for raw material, work-in-process, and finished goods inventories (eg last in first out –LIFO, first in first out- FIFO, weighted average);

<Answer>

Please see Note 2.10 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

- costing methods, including the method (eg by tonnes, units, revenue, direct costs etc) of allocating costs shared with other goods or processes (such as front office cost, infrastructure cost etc);

<Answer>

XX [Redacted – explanation of Hyosung's costing methods]

- valuation methods for damaged or sub-standard goods generated at the various stages of production;

<Answer>

XX [Redacted – explanation of Hyosung's accounting methods]

- valuation methods for scrap, by products, or joint products;

<Answer>

XX [Redacted – explanation of Hyosung's accounting methods]

- valuation and revaluation methods for fixed assets;

<Answer>

Please see Note 2.11 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

- average useful life for each class of production equipment and depreciation method and rate used for each;

<Answer>

Please see Note 2.11 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

## PUBLIC RECORD

13

- treatment of foreign exchange gains and losses arising from transactions;

<Answer>

Please see Note 2.4 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

- treatment of foreign exchange gains/losses arising from the translation of balance sheet items;

<Answer>

Please see Note 2.4 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

- inclusion of general expenses and/or interest;

<Answer>

Under K-IFRS, financing charges (such as interest and discount expenses) related to debt are used to fund the manufacture, purchase, or construction of tangible fixed assets, and those which are incurred prior to completion of the assets, can be capitalized. These capitalized interest expenses should also be reduced by the interest income earned in the temporary investment of the proceeds of the debt. Direct expenses can be capitalized under K-IFRS only when the expenditure prolongs the useful life of the asset, or increases the value of the tangible fixed assets.

XX [Redacted – explanation of Hyosung's accounting results]

- provisions for bad or doubtful debts;

<Answer>

Please see Note 10 to the audited financial statements in **Confidential Exhibit A-4.3(b)**.

- expenses for idle equipment and/or plant shut-downs;

<Answer>

Hyosung has no expenses for idle equipment and plant shut-downs.

- costs of plant closure;

<Answer>

Hyosung has no cost of plant closure.

- restructuring costs;

<Answer>

Hyosung has no restructuring cost.

- by-products and scrap materials resulting from your company's production process; and

<Answer>

XX [Redacted – explanation of Hyosung's production process and use of scrap materials]

- effects of inflation on financial statement information.

<Answer>

Please see Note 22 to the audited financial statements in Confidential Exhibit A-4.3(b).

7. In the event that any of the accounting methods used by your company have changed over the last two years provide an explanation of the changes, the date of change, and the reasons for it.

<Answer>

Hyosung changed its accounting policy to present the operating income after deducting cost of sales, and selling and administrative expenses from revenue, in accordance with the amendment of K-IFRS 1001, Presentation of Financial Statements in 2012.

Please see Notes 2.1.1 to the audited financial statements in Confidential Exhibit A-4.3(b).

## A-5 Income statement

Please fill in the following table. It requires information concerning all products produced and for the goods under consideration ('goods under consideration' (the goods) is defined in the Glossary of Terms in the Exhibit to this form). You should explain how costs have been allocated.

	Most recent completed financial year (specify)		Investigation period	
	All products	Goods Under Consideration	All products	Goods Under Consideration
Gross Sales (1)				
Sales returns, rebates and discounts (2)				
Net Sales (3=1-2)				
Raw materials (4)				

Direct Labour (5)				
Depreciation (6)				
Manufacturing overheads (7)				
Other operating expenses (8)				
<b>Total cost to make</b> <b>(9=4+5+6+7+8)</b>				
<b>OPERATING INCOME</b> <b>(10=3-9)</b>				
Selling expenses (11)				
Administrative & general expenses (12)				
Financial expenses (13)				
<b>SG&amp;A expenses</b> <b>(14)=(11+12+13)</b>				
<b>INCOME FROM NORMAL ACTIVITIES (15)=(10-14)</b>				
Interest income (16)				
Interest expense (enter as negative) (17)				
Extraordinary gains and Losses – enter losses as negative (18)				
Abnormal gains and losses – enter losses as negative (19)				
<b>PROFIT BEFORE TAX (20)=(15+16+17+18+19)</b>				
Tax (21)				
<b>NET PROFIT (22)=(20-21)</b>				

Note: if your financial information does not permit you to present information in accordance with this table please present the information in a form that closely matches the table.

Prepare this information on a spreadsheet named "**Income statement**".

<Answer>

Hyosung has provided the 'Income statement' spread sheet in the **Confidential Appendix A-5**.

*This information will be used to verify the completeness of cost data that you provide in Section G. If, because of your company's structure, the allocations would not be helpful in this process, please explain why this is the case.*

**A-6 Sales**

State your company's net turnover (after returns and all discounts), and free of duties and taxes. Use the currency in which your accounts are kept, in the following format:

	Most recent completed financial year (specify)		Investigation period	
	Volume	Value	Volume	Value
Total company turnover (all products)				
Domestic market				
Exports to Australia				
Exports to Other Countries				
Turnover of the nearest business unit, for which financial statements are prepared, which includes the goods under consideration				
Domestic market				
Exports to Australia				
Exports to Other Countries				
Turnover of the <b>goods under consideration</b>				
Domestic market				
Exports to Australia				
Exports to Other Countries				

Prepare this information in a spreadsheet named "TURNOVER".

*This information will be used to verify the cost allocations to the goods under consideration in Section G.*

*Also, you should be prepared to demonstrate that sales data shown for the goods is a complete record by linking total sales of these goods to relevant financial statements.*

<Answer>

Hyosung has provided the 'Sales' spread sheet in the **Confidential Appendix A-6**.

## PUBLIC RECORD

17

**SECTION B**  
**SALES TO AUSTRALIA (EXPORT PRICE)**

*This section requests information concerning your export practices and prices to Australia. You should include costs incurred beyond ex-factory. Export prices are usually assessed at FOB point, but the Commission may also compare prices at the ex factory level.*

*You should provide details of **all** goods under consideration (the goods):*

- *invoiced during the investigation period; and*
- *subject to tenders that were won during the investigation period, even in circumstances where the goods were not invoiced or **shipped** to Australia during the investigation period. In this circumstance, please provide details of any expenses already incurred with respect to the goods shipped outside of the investigation period,*

*For tender sales, the Commission considers the contract date will normally be taken to be the date of sale. To ensure that the Commission can make a proper assessment of date of sale, we request the contract date, invoice date and delivery date. If you consider that a date other than the contract date is the appropriate date of sale, please provide a response outlining your reasons for this.*

**B-1** For each customer in Australia to whom you shipped goods in the investigation period list:

<Answer>

XX [Redacted – customer's details]

**B-2** For each customer identified in B1 please provide the following information.

- (a) Describe how the goods are sent to each customer in Australia, including a diagram if required.

<Answer>

Each transformer is designed, manufactured and tested in-house at the factory in Korea and transported via bulk vessel. During this stage the main body of the transformer and the rest of the accessories are disassembled and then assembled together when they arrive on site. After arriving at the port of destination, each transformer is transported by suitable truck to the site.

- (b) Identify each party in the distribution chain and describe the functions performed by them. Where commissions are paid indicate whether it is a pre or post exportation expense having regard to the date of sale.

<Answer>

There is one distribution chain as Hyosung sells directly to Australian customers. In addition, there is no commission related with product under consideration.

- (c) Explain who retains ownership of the goods at each stage of the distribution chain. In the case of DDP sales, explain who retains ownership when the goods enter Australia.

<Answer>

XX [Redacted – customer information and explanation of terms of trade]

- (d) Describe any agency or distributor agreements or other contracts entered into in relation to the Australian market (supply copy of the agreement if possible).

<Answer>

N/A

- (e) Explain in detail the process by which you negotiate price, receive orders, deliver, invoice and receive payment. If export prices are determined through a tender process, supply copies of winning tender bids.

<Answer>

XX [Redacted – explanation of Hyosung's preparation of a tender bid]

Regarding copies of winning tender bid, please refer to 'Letter of Award' for Project No: XX [Redacted – Customer references] in the **Confidential Exhibit B-2(e)**.

- (f) State whether your firm is related to any of its Australian customers. Give details of any financial or other arrangements (eg free goods, rebates, or promotional subsidies) with the customers in Australia (including parties representing either your firm or the customers).

<Answer>

N/A

- (g) Details of the forward orders of the goods under consideration (include quantities, values and scheduled shipping dates).

<Answer>

N/A



## PUBLIC RECORD

19

- B-3** Do your export selling prices vary according to the distribution channel identified? If so, provide details. Real differences in trade levels are characterised by consistent and distinct differences in functions and prices.

<Answer>

N/A

- B-4** Prepare a spreadsheet named "Australian sales" listing all shipments (i.e. transaction by transaction) to Australia of the goods under consideration in the investigation period.

Where a contract has been won during the investigation period but the goods are not yet shipped, provide details of these goods with any expenses incurred to date and the scheduled delivery date specified in the contract.

You must provide this list in electronic format. Include the following export related information:

**\*\* FOB export price and Ocean Freight:**

FOB export price: An FOB export price must be calculated for each shipment - regardless of the shipping terms. FOB price includes inland transportation to the port of exportation, inland insurance, handling, and loading charges. It excludes post exportation expenses such as ocean freight and insurance. Use a formula to show the method of the calculation on each line of the export sales spreadsheet.

Ocean freight: as ocean freight is a significant cost it is important that the actual amount of ocean freight incurred on each exportation be reported. If estimates must be made you must explain the reasons and set out the basis - estimates must reflect changes in freight rates over the investigation period.

Freight allocations must be checked for consistency.

\* All of these costs are further explained in section E-1.

<Answer>

Hyosung has provided details of "Australian sales" by listing all shipments (i.e. transaction by transaction) to Australia of the goods under consideration in the investigation period in the **Confidential Appendix B-4**.

Hyosung provided the additional description related with the **Confidential Appendix B-4** as follows;

- 1) In relation to '[3] Model/product code', Hyosung provided the coding method in the **Confidential Exhibit B-4.a**.
- 2) In relation to '[8] Payment terms', please see below.

Customer Name	Payment terms
---------------	---------------

XX [Redacted – customer's details and contract terms]

3) XX [Redacted – customer's details and contract terms]

- B-5** If there are any other costs, charges or expenses incurred in respect of the exports listed above which have not been identified in the table above, add a column (see “other factors” in question B-4) for each item, and provide a description of each item. For example, other selling expenses (direct or indirect) incurred in relation to the export sales to Australia.

<Answer>

Hyosung added 3 additional columns for other export expenses.

XX [Redacted – explanation of the costs and charges incurred by Hyosung]

- B-6** For each type of discount, rebate, allowance offered on export sales to Australia:

- provide a description; and
- explain the terms and conditions that must be met by the importer to obtain the discount.

Where the amounts of these discounts, rebates etc are not identified on the sales invoice, explain how you calculated the amount shown in your response to question B4. If they vary by customer or level provide an explanation.

<Answer>

N/A

- B-7** If you have issued credit notes (directly or indirectly) to the customers in Australia, in relation to the invoices listed in the detailed transaction by transaction listing in response to question B4, provide details of each credit note if the credited amount has **not** been reported as a discount or rebate.

<Answer>

N/A

- B-8** If the delivery terms make you responsible for arrival of the goods at an agreed point within Australia (eg. delivered duty paid), insert additional columns in the spreadsheet for all other costs incurred. For example:

Import duties	Amount of import duty paid in Australia
Inland transport	Amount of inland transportation expenses within Australia included in the selling price
Other costs	Customs brokers, port and other costs incurred (itemise)

## PUBLIC RECORD

21

&lt;Answer&gt;

Please refer to the response of the question number B-4.

**B-9** For two contracts where the goods were also shipped to Australia during the investigation period, please provide a complete set of all documentation related to the export sale. For example:

- the contract between your company and your Australian customer;
- the commercial invoice;
- bill of lading, export permit;
- freight invoices in relation to movement of the goods from factory to Australia, including inland freight contract;
- marine insurance expenses; and
- letter of credit, and bank documentation, proving payment.

The Commission will select additional shipments for payment verification at the time of the visit.

&lt;Answer&gt;

Hyosung has provided a complete set of all documentation related to the export sale for two contracts in the **Confidential Exhibit B-9**.

## SECTION C

### EXPORTED GOODS & LIKE GOODS

- C-1** Fully describe all of the goods you have exported to Australia during the investigation period. Include specification details and any technical and illustrative material that may be helpful in identifying, or classifying, the exported goods.
- C-2** List each unique unit of goods exported to Australia (these types should cover all types listed in spreadsheet "**Australian sales**" – see section B of this questionnaire).

EXPORT TYPE	Mega volt amperes (MVA)	Kilo volts (kV)
Product code of each unique unit of the goods exported to Australia		

<Answer>

Hyosung has provided this information in Confidential Exhibit C-2

- C-3** List each unique unit of power transformer sold on the domestic market during the investigation period.

DOMESTIC TYPE	Mega volt amperes (MVA)	Kilo volts (kV)
Product code of each unique unit of the goods sold domestically		

<Answer>

Hyosung has provided this information in Confidential Exhibit C-3

- C-4** Please provide any technical and illustrative material that may be helpful in identifying or classifying the goods that your company sells on the domestic market.

<Answer>

Hyosung agrees that MVA and Kilo volts are the major characteristics to classify the goods. There are no goods or models in the domestic market which are identical to goods exported to Australia.

## PUBLIC RECORD

23

## SECTION D DOMESTIC SALES

*This section seeks information about the sales arrangements and prices in the domestic market of the country of export.*

*The Commission's preliminary view of normal value:*

*The Commission considers that it may not be appropriate to determine normal values in accordance with section 269TAC(1) of the Act, using your domestic sales as adjusted for proper comparison with export sales, as the goods under consideration are capital goods that are manufactured to order.*

*The Commission seeks information on your domestic sales for the purpose of determining profit so that a normal value can be properly constructed pursuant to section 269TAC (2)(c), using your cost to make and sell plus amounts for selling, general and administrative expenses and profit. If you consider that this is appropriate, **you do not need to complete Section E (fair comparison) of this questionnaire.***

*If you consider that it is appropriate for the Commission to determine normal values pursuant to section 269TAC (1) of the Act, **please ensure you complete Section D, Section E and Section F of this questionnaire.***

*Information requested in relation to domestic sales:*

*In Section B, the Commission requests information in relation to your export sales to Australia. The Commission requested the following:*

- details of all invoiced sales made during the investigation period; and
- details of all tenders won during the investigation, regardless of whether the goods were invoiced and delivered outside of the investigation period. In these circumstances, the Commission requested that you provide an estimate of when the goods will be delivered to your Australian customers.

*In relation to domestic sales, the Commission requests that you provide details of ALL of your invoiced sales during the investigation period. You **do not need** to provide details of tenders that were won during the investigation period but invoiced outside of the investigation period.*

*If there is an extraordinarily large volume of sales data and you are unable to provide the complete listing electronically you **must** contact the case officer **before** completing the questionnaire. If the case officer agrees that it is not possible to obtain a complete listing he or she will consider a method for sampling that meets the Commission requirements. If agreement cannot be reached as to the appropriate method the Commission may not visit your company.*

*If you do not have any domestic sales of like goods you must contact the case officer who will explain the information the Commission requires for determining a normal value using alternative methods.*

**D-1** Provide:

- a detailed description of your distribution channels to domestic customers, including a diagram if appropriate;
- information concerning the functions/activities performed by each party in the distribution chain; and
- a copy of any agency or distributor agreements, or contracts entered into.

If any of the customers listed are associated with your business, provide details of that association. Describe the effect, if any, that association has upon the price.

<Answer>

All of domestic sales of subject goods were sold directly to unaffiliated customers in the domestic Korean market. Hyosung has not sold any subject goods to its affiliates during the investigation period.

The flow chart of the distribution channel of the subject merchandise is as follows.



**D-2** Do your domestic selling prices vary according to the distribution channel identified? If so, provide details. Real differences in trade levels are characterised by consistent and distinct differences in functions and prices.

<Answer>

Prices of the subject goods sold in the domestic market vary as a result of sale-by-sale negotiations, and the prices are not determined by channel of distribution or type of end-user to whom Hyosung sells.

**D-3** Explain in detail the sales process, including:

- the way in which you set the price, receive orders, make delivery, invoice and finally receive payment; and the terms of the sales; and
- whether price includes the cost of delivery to customer.

If sales are in accordance with price lists, provide copies of the price lists.

<Answer>

Hyosung provides a detailed narrative explaining the domestic market sales processes below. These activities are described in chronological order.

## PUBLIC RECORD

25

XX [Redacted – explanation of the domestic sales process and customer details]

\*A flow chart illustrating the home market sales process is provided in Confidential Exhibit D-3(1) and Confidential Exhibit D-3(2).

- D-4** Prepare a spreadsheet named **"domestic sales"** listing **all** sales of like goods made during the investigation period. The listing must be provided on a CD-ROM. Include all of the following information.

Column heading	Explanation
Customer name	names of your customers. If an English version of the name is not easily produced from your automated systems show a customer code number and in a separate table list each code and name.
Level of trade	the level of trade of your domestic customer
Product code	code used in your records for the model of the goods identified. Explain the product codes in your submission.
Power rating (MVA)	Where more than one unit of the goods is shipped and the power rating differs between units, please list these units separately.
Voltage ratio (kV)	Where more than one unit of the goods is shipped and the voltage ratio differs between units, please list these units separately.
Contract number	Show order confirmation, contract or purchase order number
Contract date	Date contract was agreed with your domestic customer. Do not include information relating to contracts where the goods were invoiced outside of the investigation period.
Invoice number	invoice number
Invoice date	invoice date
Delivery date	If the delivery date is different to the invoice date please specify
Delivery terms	eg ex factory, free on truck, delivered into store
Payment terms	payment terms agreed with the customer eg. 60 days=60 etc
Quantity	quantity in units shown on the invoice eg kg.
Gross Invoice value	gross value shown on invoice <i>in the currency of sale</i> , net of taxes.
Discounts on the Invoice	the amount of any discount deducted on the invoice on each transaction. If a % discount applies show that % discount applying in another column.
Other charges	any other charges, or price reductions, that affect the net invoice value. Insert additional columns and provide description.
Net invoice value in the currency of the exporting country	the net invoice value expressed in your domestic currency as recorded in your accounting system
Rebates or other Allowances	the actual amount of any deferred rebates or allowances in the currency of sale
Quantity discounts	the actual amount of quantity discounts not deducted from the invoice. Show a separate column for each type of quantity discount.
Packing*	packing expenses
Inland transportation Costs*	amount of inland transportation costs included in the selling price.
Handling, loading And ancillary Expenses*	handling, loading & ancillary expenses.
Warranty & Guarantee expenses*	warranty & guarantee expenses
Installation expenses	Any expense associated with the installation of the goods if included in the contract

Technical assistance & other services*	expenses for after sale services such as technical assistance or installation costs.
Commissions*	commissions paid. If more than one type is paid insert additional columns of data.
Other factors*	<b>any other</b> costs, charges or expenses incurred in relation to the domestic sales (include additional columns as required). See question D5.

Costs marked with \* are explained in section E-2.

<Answer>

Hyosung has provided a detailed list of all domestic sales during the investigation period in the excel file named as "domestic sales" in this response at **Confidential Appendix D-4**. All fields requested in the questionnaire are fully reported in the "domestic sales" file without any omission.

For the field name of "product code", Hyosung reported the product code maintained in its operation system. The detailed explanation how Hyosung assigns its product code is provided in **Confidential Exhibit B-4.a** in this response.

- D-5** If there are any other costs, charges or expenses incurred in respect of the sales listed which have not been identified in the table in question D-4 above add a column for each item (see "other factors"). For example, certain other selling expenses incurred.

<Answer>

There are no any other costs, charges or expenses incurred in respect of the sales listed which have not been identified in the table in question D-4.

- D-6** For each type of commission, discount, rebate, allowance offered on domestic sales of like goods:

- provide a description; and
- explain the terms and conditions that must be met by the customer to qualify for payment.

Where the amounts of these discounts, rebates etc are not identified on the sales invoice, explain how you calculated the amounts shown in your response to question D4.

If you have issued credit notes, directly or indirectly to the customers, provide details if the credited amount has **not** been reported as a discount or rebate.

<Answer>



## PUBLIC RECORD

27

No commission, discount, rebate, allowance were provided by Hyosung on its sales in the domestic market.

- D-7** Select two domestic sales that are at the same level of trade as the export sales. Provide a complete set of documentation for those two sales. (Include, for example, the tender bid, the contract of sale, commercial invoice, discounts or rebates applicable, credit/debit notes, inland freight contract, bank documentation showing proof of payment.)

The Commission will select additional sales for verification at the time of our visit.

<Answer>

As requested in the questionnaire, Hyosung has provided the full sales documents including the expenses incurred for the selected two samples. These sample domestic market sale documentations are provided in **Confidential Exhibit D-7**.

## SECTION E FAIR COMPARISON

**As outlined in Section D, please complete Section E only if you would submit that the Commission should determine normal values pursuant to section 269TAC (1).**

<Answer>

According to above request, Hyosung has not submitted a response to Section E.

*Section B sought information about the export prices to Australia and Section D sought information about prices on your domestic market for like goods (ie. the normal value).*

*Where the normal value and the export price are not comparable adjustments may be made. This section informs you of the fair comparison principle and asks you to quantify the amount of any adjustment.*

*As prices are being compared, the purpose of the adjustments is to eliminate factors that have unequally modified the prices to be compared.*

*To be able to quantify the level of any adjustment it will usually be necessary to examine cost differences between sales in different markets. The Commission must be satisfied that those costs are likely to have influenced price. In practice, this means that the expense item for which an adjustment is claimed should have a close nexus to the sale. For example, the cost is incurred because of the sale, or because the cost is related to the sale terms and conditions.*

*Conversely, where there is not a direct relationship between the expense item and the sale a greater burden is placed upon the claimant to demonstrate that prices have been affected, or are likely to have been affected, by the expense item. In the absence of such evidence the Commission may disallow the adjustment.*

*Where possible, the adjustment should be based upon actual costs incurred when making the relevant sales. However, if such specific expense information is unavailable cost allocations may be considered. In this case, the party making the adjustment claim must demonstrate that the allocation method reasonably estimates costs incurred.*

*A party seeking an adjustment has the obligation to substantiate the claim by relevant evidence that would allow a full analysis of the circumstances, and the accounting data, relating to the claim.*

## PUBLIC RECORD

29

*The investigation must be completed within strict time limits therefore you must supply information concerning claims for adjustments in a timely manner. Where an exporter has knowledge of the material substantiating an adjustment claim that material is to be available at the time of the verification visit. The Commission will not consider new claims made after the verification visit.*

## E-1 Costs associated with export sales

(These cost adjustments will relate to your responses made at question B-4, 'Australian sales')

### 1. Transportation

Explain how you have quantified the amount of inland transportation associated with the export sale ("**Inland transportation costs**"). Identify the general ledger account where the expense is located. If the amount has been determined from contractual arrangements, not from an account item, provide details and evidence of payment.

### 2. Handling, loading and ancillary expenses

List all charges that are included in the export price and explain how they have been quantified ("**Handling, loading & ancillary expenses**"). Identify the general ledger account where the expenses are located. If the amounts have been determined using actual observations, not from a relevant account item, provide details.

The various export related ancillary costs are identified in the table at question B4, for example:

- terminal handling;
- wharfage and other port charges;
- container taxes;
- document fees and customs brokers fees;
- clearance fees;
- bank charges; letter of credit fees
- other ancillary charges.

### 3. Credit

The cost of extending credit on export sales is not included in the amounts quantified at question B4. However, the Commission will examine whether a credit adjustment is warranted and determine the amount. Provide applicable interest rates over each month of the investigation period. Explain the nature of the interest rates most applicable to these export sales eg, short term borrowing in the currency concerned.

If your accounts receivable shows that the average number of collection days differs from the payment terms shown in the sales listing, *and if* export prices are influenced by this longer or shorter period, calculate the average number of collection days. See also item 4 in section E-2 below.

### 4. Packing costs

## PUBLIC RECORD

30

List material and labour costs associated with packing the export product. Describe how the packing method differs from sales on the domestic market, for each model. Report the amount in the listing in the column headed **'Packing'**.

**5. Commissions**

For any commissions paid in relation to the export sales to Australia:

- provide a description; and
- explain the terms and conditions that must be met.

Report the amount in the sales listing in question B-4 under the column headed **"Commissions"**. Identify the general ledger account where the expense is located.

**6. Warranties, guarantees, installation and after sales services**

List the costs incurred. Show relevant sales contracts. Show how you calculated the expenses (**"Warranty & guarantee expenses"**, **"Installation expenses"** and **"Technical assistance & other services"**), including the basis of any allocations. Include a record of expenses incurred. Technical services include costs for the service, repair, or consultation. Where these expenses are included in the contract for sale or closely related to the sales in question, an adjustment will be considered. Identify the ledger account where the expense is located.

**7. Other factors**

There may be other factors for which an adjustment is required if the costs affect price comparability – these are identified in the column headed **"Other factors"**. For example, other variable or fixed selling expenses, including salesmen's salaries, salesmen's travel expenses, advertising and promotion, samples and entertainment expenses. Your consideration of questions asked at Section G, concerning domestic and export costs, would have alerted you to such other factors.

**8. Currency conversions**

In comparing export and domestic prices a currency conversion is required. Fluctuations in exchange rates can only be taken into account when there has been a 'sustained' movement during the period of investigation (see article 2.4.1 of the WTO Agreement). The purpose is to allow exporters 60 days to adjust export prices to reflect 'sustained' movements. Such a claim requires detailed information on exchange movements in your country over a long period that includes the investigation period.

**E-2 Costs associated with domestic sales**

(These cost adjustments will relate to your responses made at question D-4, **"domestic sales"**)

*The following items are not separately identified in the amounts quantified at question D-4. However you should consider whether any are applicable.*

**1. Physical characteristics**

## PUBLIC RECORD

31

This adjustment recognises that differences, such as structure or design, mean that the goods are not identical. The Commission considers that the goods are unlikely to have identical models sold on the domestic market as they are large capital goods that are produced to order.

To support your claim that the Commission should determine normal values pursuant to section 269TAC (1), you will need to identify and quantify the physical or specification differences in order to ensure fair comparison.

The amount of the adjustment shall be based upon the market value of the difference, but where this is not possible the adjustment shall be based upon the difference in cost plus the gross profit mark-up (i.e. an amount for selling general and administrative costs (S G & A) plus profit).

The adjustment is based upon actual physical differences in the goods being compared and upon the manufacturing cost data.

Using the table below, provide a list of the claimed comparable product sold on the domestic market. Describe in detail the specification differences between the comparable products. Also provide your claimed adjustment on the basis of this specification difference, stating the source of your data.

The Commission will seek to verify your claimed specification adjustments during the verification visit.

EXPORTED TYPE	DOMESTIC TYPE	DIFFERENCES	CLAIMED ADJUSTMENT
Product code, power rating and voltage ratio of each model of the goods exported to Australia	Product code, power rating and voltage ratio of comparable model sold on the domestic market of the country of export	Describe the specification differences in detail. If it is impractical to detail specification differences in this table refer to documents which outline differences	The claimed adjustment must be quantifiable and supported by evidence that is available for verification by the Commission

## 2. Import charges and indirect taxes

If exports to Australia:

- are partially or fully exempt from internal taxes and duties that are borne by the like goods in domestic sales (or on the materials and components physically incorporated in the goods), or
- if such internal taxes and duties have been paid and are later remitted upon exportation to Australia;

the price of like goods must be adjusted downwards by the amount of the taxes and duties.

The taxes and duties include sales, excise, turnover, value added, franchise, stamp, transfer, border, and excise taxes. Direct taxes such as corporate income tax are not included as such taxes do not apply to the transactions.

Adjustment for drawback is not made in every situation where drawback has been received. Where an adjustment for drawback is appropriate you must provide information showing the import duty borne by the domestic sales. (That is, it is not sufficient to show the drawback amount and the export sales quantity to Australia. For example, you may calculate the duty borne on domestic sales by quantifying the total amount of import duty paid and subtracting the duty refunded on exports to all countries. The difference, when divided by the domestic sales volume, is the amount of the adjustment).

In substantiating the drawback claim the following information is required:

- a copy of the relevant statutes/regulations authorising duty exemption or remission, translated into English;
- the amount of the duties and taxes refunded upon *exportation* and an explanation how the amounts were calculated and apportioned to the exported goods;
- an explanation as to how you calculated the amount of duty payable on imported materials is borne by the goods sold *domestically* but is not borne by the exports to Australia;

#### Substitution drawback systems

Annex 3 of the WTO Agreement on Subsidies provides: *"Drawback systems can allow for the refund or drawback of import duties on inputs which are consumed in the production process of another product and where the export of this latter product contains domestic inputs having the same quality and characteristics as those substituted for the imported inputs"*

If such a scheme operates in the country of export adjustments can also be made for the drawback payable on the substituted domestic materials, provided the total amount of the drawback does not exceed the total duty paid.

### **3. Level of trade**

Question D-4 asks you to indicate the level of trade to the domestic customer. To claim an adjustment for level of trade differences you will need to quantify the amount by which level of trade influences price.

Trade level is the level a company occupies in the distribution chain. The trade level to which that company in turn sells the goods and the functions carried out distinguish a level of trade. Examples are producer, national distributor, regional distributor, wholesaler, retailer, end user, and original equipment.

## PUBLIC RECORD

33

It may not be possible to compare export prices and domestic prices at the same level of trade. Where relevant sales of like goods at the next level of trade must be used to determine normal values an adjustment for the difference in level of trade may be required where it is shown that the difference affects price comparability.

The information needs to establish that there are real trade level differences, not merely nominal differences. Real trade level differences are characterised by a consistent pattern of price differences between the levels and by a difference in functions performed. If there is no real trade level differences all sales are treated as being at the same level of trade.

A real difference in level of trade (may be adjusted for using either of the following methods:

- (a) *costs arising from different functions*: the amount of the costs, expenses etc incurred by the seller in domestic sales of the like goods resulting from activities that would not be performed were the domestic sales made at the same level as that of the importer.

This requires the following information:

- a detailed description of each sales activity performed in selling to your domestic customers (for example sales personnel, travel, advertising, entertainment etc);
- the cost of carrying out these activities in respect of like goods;
- for each activity, whether your firm carries out the same activity when selling to importers in Australia;
- an explanation as to why you consider that you are entitled to a level of trade adjustment.

or

- (b) *level discount*: the amount of the discount granted to purchasers who are at the same level of trade as the importer in Australia. This is determined by an examination of price differences between the two levels of trade in the exporter's domestic market, for example sales of like goods by other vendors or sales of the same general category of goods by the exporter. For this method to be used it is important that a clear pattern of pricing be established for the differing trade levels. Such pattern is demonstrated by a general availability of the discounts to the level - isolated instances would not establish a pattern of availability.

#### 4. Credit

The cost of extending credit on domestic sales is not included in the amounts quantified at question D-4. However, the Commission will examine whether a credit adjustment is warranted and determine the amount. An adjustment for credit is to be made even if funds are not borrowed to finance the accounts receivable.

## PUBLIC RECORD

34

The interest rate on domestic sales in order of preference is:

- the rate, or average of rates, applying on actual short term borrowing's by the company; or
- the prime interest rate prevailing for commercial loans in the country for credit terms that most closely approximate the credit terms on which the sales were made; or
- such other rate considered appropriate in the circumstances.

Provide the applicable interest rate over each month of the investigation period.

If your accounts receivable shows that the average number of collection days differs from the payment terms shown in the sales listing, and if domestic prices are influenced by this longer or shorter period, calculate the average number of collection days.

Where there is no fixed credit period agreed at the time of sale the period of credit is determined on the facts available. For example, where payment is made using an open account system<sup>1</sup>, the average credit period may be determined as follows:

1. *Calculate an accounts receivable turnover ratio*

This ratio equals the total credit sales divided by average accounts receivable. (It is a measure of how many times the average receivables balance is converted into cash during the year).

In calculating the accounts receivable turnover ratio, credit sales should be used in the numerator whenever the amount is available from the financial statements. Otherwise net sales revenue may be used in the numerator.

An average accounts receivable over the year is used in the denominator. This may be calculated by:

- using opening accounts receivable at beginning of period plus closing accounts receivable at end of period divided by 2, or
- total monthly receivables divided by 12.

2. *Calculate the average credit period*

The average credit period equals 365 divided by the accounts receivable turnover ratio determined above at 1.

The resulting average credit period should be tested against randomly selected transactions to support the approximation.

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<sup>1</sup> Under an open account system, following payment the balance of the amount owing is carried into the next period. Payment amounts may vary from one period to the next, with the result that the amount owing varies.



## PUBLIC RECORD

35

*The following items are identified in the amounts quantified at question D-4:*

**5. Transportation**

Explain how you have quantified the amount of inland transportation associated with the domestic sales ("**Inland transportation Costs**"). Identify the general ledger account where the expense is located. If the amount has been determined from contractual arrangements, not from an account item, provide details and evidence of payment.

**6. Handling, loading and ancillary expenses**

List all charges that are included in the domestic price and explain how they have been quantified ("**Handling, loading and ancillary Expenses**"). Identify the general ledger account where the expense is located. If the amounts have been determined using actual observations, not from a relevant account item, provide details.

**7. Packing**

List material and labour costs associated with packing the domestically sold product. Describe how the packing method differs from sales on the domestic market, for each model. Report the amount in the listing in the column headed "**Packing**".

**8. Commissions**

For any commissions paid in relation to the domestic sales:

- provide a description
- explain the terms and conditions that must be met.

Report the amount in the sales listing under the column headed "**Commissions**". Identify the general ledger account where the expense is located.

**9. Warranties, guarantees, installation expenses and after sales services**

List the costs incurred. Show relevant sales contracts. Show how you calculated the expenses ("**Warranty & Guarantee expenses**", "**Installation expenses**" and "**Technical assistance & other services**"), including the basis of any allocations. Include a record of expenses incurred. Technical services include costs for the service, repair, or consultation. Where these expenses are included in the contract for sale or closely related to the sales in question, an adjustment will be considered. Identify the ledger account where the expense is located.

**10. Other factors**

There may be other factors for which an adjustment is required if the costs affect price comparability – these are identified in the column headed "**Other factors**". List the factors and show how each has been quantified in per unit terms. For example:

## PUBLIC RECORD

36

- *inventory carrying cost*: describe how the products are stored prior to sale and show data relating to the average length of time in inventory. Indicate the interest rate used;
- *warehousing expense*: an expense incurred at the distribution point;
- *royalty and patent fees*: describe each payment as a result of production or sale, including the key terms of the agreement;
- *advertising*; and
- *bad debt*.

**E-3 Duplication**

In calculating the amount of the adjustments you must ensure that there is no duplication.

For example:

- adjustments for level of trade, quantity or other discounts may overlap, or
- calculation of the amount of the difference for level of trade may be based upon selling expenses such as salesperson's salaries, promotion expenses, commissions, and travel expenses.

Separate adjustment items must avoid duplication.

An adjustment for quantities may not be granted unless the effect on prices for quantity differences is identified and separated from the effect on prices for level of trade differences.

## PUBLIC RECORD

37

## SECTION F

### EXPORT SALES TO COUNTRIES OTHER THAN AUSTRALIA (THIRD COUNTRY SALES)

*As outlined in Section D, the Commission considers that, given the nature of the goods under consideration, it may not be appropriate to determine normal values on the basis of domestic sales (pursuant to section 269TAC(1)), or sales to third countries (pursuant to section 269TAC(2)(d)).*

**Please complete Section F only if you would submit that it is appropriate for the Commission to determine normal values pursuant to section 269TAC(2)(d).**

<Answer>

According to above direction, Hyosung has not submitted a response to Section F.

*Your response to this part of the questionnaire may be used by the Commission to select sales to a third country that may be suitable for comparison with exports to Australia.*

*Sales to third countries may be used as the basis for normal value in certain circumstances. The Commission may seek more detailed information on particular third country sales where such sales are likely to be used as the basis for determining normal value.*

**F-1 Using the column names and column descriptions below provide a summary of your export sales to countries other than Australia.**

Column heading	Explanation
Country	Name of the country that you exported like goods to over the investigation period.
Number of customers	The number of different customers that your company has sold like goods to in the third country over the investigation period.
Level of trade	The level of trade that you export like goods to in the third country.
Quantity	Indicate the number of units sold
Value of sales	Show net sales value to all customers in third country over the investigation period
Currency	Currency in which you have expressed data in column SALES
Payment terms	Typical payment terms with customer(s) in the country eg. 60 days=60 etc
Shipment terms	Typical shipment terms to customers in the third country eg CIF, FOB, ex-factory, DDP etc.

Supply this information in spreadsheet file named "Third country"

**PUBLIC RECORD**

38

**F-2 Please identify any differences in sales to third countries which may affect their comparison to export sales to Australia.**

## PUBLIC RECORD

39

## SECTION G

### COSTING INFORMATION AND CONSTRUCTED VALUE

*The information that you supply in response to this section of the questionnaire will be used for various purposes including:*

- testing the profitability of sales of like goods on the domestic market;*
- determining a constructed normal value of the goods under consideration (the goods) - ie of the goods exported to Australia; and*
- making certain adjustments to the normal value.*

*You will need to provide the cost of production of both the exported goods (the goods) and for the like goods sold on the domestic market. You will also need to provide the selling, general, and administration costs relating to goods sold on the domestic market; the finance expenses; and any other expenses (eg. non-operating expenses not included elsewhere) associated with the goods.*

*In your response please include a worksheet showing how the selling, general, and administration expenses; the finance expenses; and any other expenses have been calculated.*

***Please provide costs associated to each of the export sales detailed at question B4 and domestic sales details in question D4.***

For export sales, this will include costs associated with tenders that may be invoiced or delivered outside of the investigation period. Where these costs have not yet been incurred, please provide an estimate of these costs such as, for example, the cost you estimated at the time of bidding for the tender.

*For domestic sales, you only need to include **actual** costs incurred in relation to goods invoiced during the investigation period.*

*At any verification meeting you must be prepared to reconcile the costs shown to the accounting records used to prepare the financial statements.*

#### **G-1. Production process and capacity**

1. Describe the production process for the goods. Provide a flowchart of the process. Include details of all products manufactured using the same production facilities as those used for the goods. Also specify all scrap or by-products that result from producing the goods.

<Answer>

A flowchart illustrating Hyosung's production process for the product under consideration is provided in **Confidential Exhibit G-1**. The description of the production process is provided below.

## PUBLIC RECORD

40

XX [Redacted – explanation of Hyosung's production process]

**G-2. Provide information about your company's total production in the following table:**

	PREVIOUS FINANCIAL YEAR	MOST RECENT FINANCIAL YEAR	Investigation Period
A – Production capacity (eg capacity of units sold)*			
B – Actual production in volume (eg capacity of units sold)			
C – Capacity utilisation (%) (B/A x 100)			

\* rather than showing a 'name-plate' optimal capacity it is more meaningful to show the maximum level of production that may reasonably be attained under normal operating conditions. For example assuming: normal levels of maintenance and repair; a number of shifts and hours of operation that is not abnormally high; and a typical production mix.

Provide this information on a spreadsheet named "**Production**".

<Answer>

Hyosung has provided the "Production" spreadsheet in the **Confidential Appendix G-2**

**G-3. Cost accounting practices**

1. Outline the management accounting system that you maintain and explain how that cost accounting information is reconciled to your audited financial statements.

<Answer>

The cost accounting system reconciles directly with the financial accounting system. Costs of manufacture adjusted for the beginning and ending inventory transfer to construction-in-progress, and the inventory valuation adjustment for financial accounting purposes represents the cost of sales on the audited financial statements.

- 2 Is your company's cost accounting system based on standard (budgeted) costs? State whether standard costs were used in your responses to this questionnaire. If they were state whether all variances (ie differences between standard and actual production costs) have been allocated to the goods - and describe how those variances have been allocated.

<Answer>

## PUBLIC RECORD

41

XX [Redacted – explanation of Hyosung's costing and budgeting processes]

- 3 Provide details of any significant or unusual cost variances that occurred during the investigation period.

<Answer>

Hyosung did not have any significant or unusual cost variances that occurred during the investigation period.

- 4 Describe the profit/cost centres in your company's cost accounting system.

<Answer>

The cost centres under Hyosung's cost accounting system are listed in **Confidential Exhibit G-3**

- 5 For each profit/cost centre describe in detail the methods that your company normally uses to allocate costs to the goods under consideration. In particular specify how, and over what period, expenses are amortised or depreciated, and how allowances are made for capital expenditures and other development costs.

<Answer>

XX [Redacted – information regarding Hyosung's accounting methods]

- 6 Describe the level of product specificity (models, grades etc) that your company's cost accounting system records production costs.

<Answer>

Hyosung does not construct production cost by the models, grades, etc., instead Hyosung uses a unique project number for each of the power transformers in its cost accounting system.

- 7 List and explain all production costs incurred by your company which are valued differently for cost accounting purposes than for financial accounting purposes.

<Answer>

Hyosung's accounting practices for cost accounting purpose and financial accounting purpose are not different.

- 8 State whether your company engaged in any start-up operations in relation to the goods under consideration. Describe in detail the start-up operation giving dates (actual or projected) of each stage of the start-up operation.

<Answer>

Hyosung did not have any start-up operations during the POI. Therefore, the remainder of this question is omitted.

- 9 State the total cost of the start-up operation and the way that your company has treated the costs of the start-up operation in its accounting records.

<Answer>

Hyosung did not have any start-up operations during the POI. Therefore, the remainder of this question is omitted.

#### G-4 Cost to make and sell on domestic market

*This information is relevant to testing whether domestic sales are in the ordinary course of trade.<sup>2</sup>*

1. Please provide (in the format shown in the table below) the actual unit cost to make and sell each model/type\* (identified in section C) of the like goods sold on the domestic market. Provide this cost data for each unique unit of the goods invoiced during the investigation period.

<Answer>

Hyosung has provided the "Domestic CTMS" spread sheet in the **Confidential Appendix G-4**.

In addition, Hyosung has provided the worksheet showing the calculation of the ratio of GNA (General & Administrative Expenses), selling expenses, financial expenses and other expenses in the **Confidential Exhibit G-4(1)**.

2. Indicate the source of cost information (account numbers etc) and/or methods used to allocate cost to the goods. Provide documentation and worksheets supporting your calculations.

<Answer>

Hyosung has provided its "Sample cost calculation" spread sheet in the **Confidential Exhibit G-4(2)**.

<b>CUSTOMER</b>		
Contract number		
Item number		
Quantity		
Contract date		
Delivery date		
Power rating (MVA)		
Voltage Ratio (kV)		
<b>Variable manufacturing costs</b>		
Raw material - core steel		
Raw material - conductor		
Raw material - insulation		
Raw material - mild steel		

<sup>2</sup> The Commission applies the tests set out in s.269TAAD of the Customs Act 1901 to determine whether goods are in ordinary course of trade. These provisions reflect the WTO anti-dumping agreement – see Article 2.2.1.



## PUBLIC RECORD

43

Raw material – tapchanger		
Raw material - CT & CT terminal box		
Raw material - radiators or heat ex., fittings		
Raw material - fibre optics probes		
Raw material – fans		
Raw material – pumps		
Raw material – valves		
Raw material - control panel		
Raw material – oil		
Raw material - bushings (HV, MV, LV)		
Raw material – other		
Direct labour – Engineering (design)		
Direct labour – manufacturing (production)		
Other costs		
<b>Fixed manufacturing costs</b>		
Overheads		
Depreciation		
Finance charges		
Other costs		
<b>Total cost to make</b>		
Selling costs		
Administration costs		
Financial costs		
Delivery expenses		
Other costs		
<b>Total cost to sell</b>		
<b>Total cost to make and sell</b>		
<b>Unit cost to make and sell</b>		

Prepare this information in a spreadsheet named "**Domestic CTMS**".

*Provide this information for each unique unit of the goods invoiced during the period of the investigation. For example, if one contract specifies production of two different types of the goods, provide this information for each type of the goods.*

*Provide the information broken down into fixed and variable costs, and indicate the % total cost represented by fixed costs.*

*If you are unable to supply this information in this format, please contact the case officer for this investigation at the address shown on the cover of this questionnaire.*

*Please specify unit of currency.*

### G-5 Cost to make and sell goods under consideration (goods exported to Australia)

*The information is relevant to calculating the normal values based on costs. It is also relevant to calculating certain adjustments to the normal value.*

<b>CUSTOMER</b>		
Contract number		
Item number		
Quantity		
Contract date		
Delivery date		
Power rating (MVA)		
Voltage Ratio (kV)		
<b>Variable manufacturing costs</b>		
Raw material - core steel		
Raw material - conductor		
Raw material - insulation		
Raw material - mild steel		
Raw material - tapchanger		
Raw material - CT & CT terminal box		
Raw material - radiators or heat ex., fittings		
Raw material - fibre optics probes		
Raw material - fans		
Raw material - pumps		
Raw material - valves		
Raw material - control panel		
Raw material - oil		
Raw material - bushings (HV, MV, LV)		
Raw material - other		
Direct labour – Engineering (design)		
Direct labour – Manufacturing (production)		
Other costs		
<b>Fixed manufacturing costs</b>		
Overheads		
Depreciation		
Finance charges		
Other costs		
<b>Total cost to make</b>		
Selling costs		
Administration costs		
Financial costs		
Delivery expenses		
Other costs		
<b>Total cost to sell</b>		
<b>Total cost to make and sell</b>		
<b>Unit cost to make and sell</b>		

Prepare this information in a spreadsheet named "Australian CTMS".

## PUBLIC RECORD

45

*Provide this information for all goods invoiced during the investigation period and for all goods the subject of a contract that was entered into during the investigation period, but invoiced or delivered outside of the investigation period. Where actual costs are not yet incurred, provide an estimate of these costs, such as for example, the estimate of the costs that formed the basis of your winning tender bid.*

*Provide this information for each unique unit of the goods contracted for sale or invoiced during the period of the investigation. For example, if one contract specifies production of two different types of the goods, provide this information for each type of the goods.*

*Provide the information broken down into fixed and variable costs, and indicate the % total cost represented by fixed costs.*

*If you are unable to supply this information in this format, please contact the case officer for this investigation at the address shown on the cover of this questionnaire.*

*Please specify unit of currency.*

<Answer>

Hyosung has provided the "Australian CTMS" spreadsheet in the **Confidential Appendix G-5**

- 1 Where there are cost differences between goods sold to the domestic market and those sold for export, give reasons and supporting evidence for these differences.

<Answer>

There are no cost differences between goods sold to the domestic market and those sold for export, therefore this question is not applicable.

- 2 Give details and an explanation of any significant differences between the costs shown, and the costs as normally determined in accordance with your general accounting system. Reference should be made to any differences arising from movements in inventory levels and variances arising under standard costing methods.

<Answer>

XX [Redacted – details of Hyosung's costing methods and accounting system]

- 3 In calculating the unit cost to make and sell, provide an explanation if the allocation method used (eg number, or weight etc) to determine the unit cost differs from the prior practice of your company.

<Answer>

Hyosung did not use any allocation method to report cost of production. Therefore, this question is not applicable.

## G-6 Major raw material costs

List major raw material costs, which individually account for 10% or more of the total production cost.

<Answer>

The most significant inputs used in producing the goods under consideration during the investigation period are as follows;

XX [Redacted – explanation of production practices]

The approximate percentage that each of these inputs represents of the total cost of manufacturing of the goods under consideration:

XX [Redacted – details of suppliers and explanation of production practices]

For these major inputs:

- identify materials sourced in-house and from associated entities;
- identify the supplier; and
- show the basis of valuing the major raw materials in the costs of production you have shown for the goods (eg market prices, transfer prices, or actual cost of production).
- 

<Answer>

XX [Redacted – explanation of Hyosung's production processes]

Thus, this question is not applicable.

The basis of valuing the major raw materials in the costs of production for the goods under consideration is the XX [Redacted – explanation of Hyosung's production processes].

Where the major input is produced by an associate of your company the Commission will compare your purchase price to a normal market price. If the associate provides information on the cost of production for that input such cost data may also be considered.

Normal market price is taken to be the price normally available in the market (having regard to market size, whether the input is normally purchased at 'spot prices' or under long term contracts etc).

The term associate is defined in section 269TAA of the *Customs Act*. Included in that definition are companies controlled by the same parent company (a company that controls 5% or more of the shares of another is taken to be an associated company); companies controlled by the other company; and companies having the same person in the board of directors.

**Important note: If the major input is sourced as part of an integrated production process you should provide detailed information on the full costs of production of that input.**

## PUBLIC RECORD

48

**SECTION H  
EXPORTER'S DECLARATION**

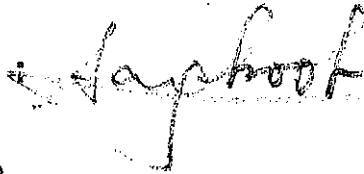
I hereby declare that Hyosung Corporation did, during the period of investigation export the goods under consideration and have completed the attached questionnaire and, having made due inquiry, certify that the information contained in this submission is complete and correct to the best of my knowledge and belief.



I hereby declare that.....(company) did not, during the period of investigation, export the goods under consideration and therefore have not completed the attached questionnaire.

**Name : Sang-Kook Lee**

**Signature :**



**Position in**

**Company : General Manager**

**Date : October 15, 2013**

## PUBLIC RECORD

49

## SECTION I CHECKLIST

*This section is an aid to ensure that you have completed all sections of this questionnaire.*

Section	Please tick if you have responded to all questions
Section A – general information	X
Section B – export price	X
Section C – like goods	X
Section D – domestic price	X
Section E – fair comparison	X
Section F – exports to third countries	X
Section G – costing information	X
Section H – declaration	X

Electronic Data	Please tick if you have provided spreadsheet
<b>INCOME STATEMENT</b>	X
<b>TURNOVER</b> – sales summary	X
<b>AUSTRALIAN SALES</b> – list of sales to Australia	X
<b>DOMESTIC SALES</b> – list of all domestic sales of like goods	X
<b>THIRD COUNTRY</b> – third country sales	N/A
<b>PRODUCTION</b> – production figures	X
<b>DOMESTIC COSTS</b> – costs of goods sold domestically	X
<b>AUSTRALIAN COSTS</b> – costs of goods sold to Australia	X

# Power Transformers



[www.hyosungpni.com](http://www.hyosungpni.com)

Global Top Energy, Machinery & Plant Solution Provider

 **HYOSUNG CORPORATION**  
Power & Industrial Systems Performance Group

**HEAD OFFICE** 450, Gongdeok-Dong, Mapo-Gu, Seoul, Korea 121-720 TEL : 82-2-707-6008

**R&D CENTER** 183, Hoge-Dong, Dongan-Gu, Anyang-Si, Gyeonggi-Do, Korea 431-080 TEL : 82-31-428-1000

**CHANGWON PLANT** 454-2, Nae-Dong, Changwon-Si, Gyeongsangnam-Do, Korea 641-050 TEL : 82-55-268-9114





# About HYOSUNG



Hyosung Power & Industrial Systems PG is a division under Hyosung which consists of seven performance groups (PGs). In addition to establishing itself as a world-class manufacturer of electrical equipments, green technology and industrial machineries, Hyosung is also the largest producer of tire cords and spandex in the global market and the second largest supplier of ATMs in the USA.

## 01 Our Business

Brief introduction of Hyosung Power & Industrial Systems

### Hyosung Power & Industrial Systems Performance Group

Hyosung Power & Industrial Systems Performance Group, a comprehensive energy solution provider, boasts world-leading technology in the global power industry and has secured a competitive capability on par with that of top competitors in transformers, switchgears, motors, decelerators, industrial pumps, and wind energy business.

With globalization as one of our top priorities, we have achieved outstanding increase in sales over the past few years thanks to the enhancement in Hyosung's quality, technology, and brand recognition among overseas clients, which include North America, Europe, the Middle East, and Asia. We expect such robust performance, marked by an increasing number of orders from the overseas market, to continue in the future.

At the heart of our capability to grow as a comprehensive energy solution provider is our global organization structure. Hyosung Power & Industrial Systems Performance Group is divided into four business areas or performance units, depending on the types of flagship products: Power Systems Performance Unit, Industrial Machinery Performance Unit, Hyosung GoodSprings Performance Unit, and the Wind Energy Business Division.

### Power Systems Performance Unit

Hyosung's Power Systems Performance Unit provides a full spectrum of power generation, transmission, and distribution services, from design and engineering to the maintenance of equipment and has been building up on cutting-edge information technology resources and developing substation automation systems, such as power monitor and control systems, and early detection and prevention systems.

Such vast product assortment and technical know-how is based on our product development history. In 1992, Hyosung was the first in Korea, and the sixth in the world, to develop a 765kV ultra-high voltage (UHV) transformer, and, in 1999, was the first in the world to manufacture the 800kV gas insulated switchgear (GIS), which has put Hyosung on an equal technological ground as its top global competitors.

Having such world-class technology, we established Baoding Hyosung Tianwei Transformer Co., Ltd., a joint venture with the Baoding Tianwei Organization, to hold the largest share of the market in Baoding City, China. This venture was established in 2003, and by the end of 2004, we established a production plant producing 11,000 transformers per year. In 2006 we acquired one of the top five companies in quality terms as certified by the Chinese government, Nantong Hyosung Transformer Co., Ltd. in Jiangsu.

The Power systems Performance Unit is continuously striving to secure competitiveness in every aspect of quality, technology, sales, services, and management, in order to satisfy customer needs globally and become a top-tire company in the world by providing customers with the best quality products and services in the power systems sector.

## Power Transformers

### CONTENTS

02 Our Business 03 Sustainability 03 R&D 04 General 05 Technology 06 Design Concept 08 Products and Details  
11 Compartments 12 Manufacturing Process 14 Total Quality Assurance 15 Global Network / Product Development History

## 02 Sustainability

Our sustainability principles are the backbone of the way we design and manufacture products

### Quality Assurance

Hyosung strives for excellence. We believe excellence can only be achieved through absolute quality and value for customers. In order to create quality products, we believe that all of the actions of every single employee must be focused in the highest level of quality. In order to achieve such levels, we have implemented a quality assurance policy and programs that make our philosophy into a reality. Our Quality Assurance Policy was founded based on the management policy of the president and meets the demands of ISO 9001. As a globally active company, we are committed to comprehensive and quality management through three quality strategies: quality management system, customer-focused management system, and concentration on core competencies.

The comprehensive quality management system ensures that we completely comply with all compliances and applicable legislation, codes, and standards in addition to implementing efficient operation of our management resources to eliminate unnecessary waste. Our customer-focused management system clarifies and simplifies our first priority which is customer satisfaction. All of our work is aimed to exceed customer needs and provide exceptional value through quality standards, flexibility, and innovation. Finally, we concentrate on our core competencies for strict quality control and continual improvement which provides quality products and cost-saving to our clients via advancement in technical capacity and technological innovation.

We implement our policy via a Quality Management Team manages research laboratories, including the Measurement Standard Laboratory, the Chemical Analysis Laboratory and the Material Analysis Laboratory to maintain a strict control over quality.



### Environment Protection Policy

Hyosung understands the impact of Hyosung's activities in the environment and works to protect the environment from pollution, manages the environmental impacts of Hyosung's products and technologies, and prevents future pollution and harmful effects in the environment by investing in environmentally-friendly products and solutions.

Based on this eco-philosophy of shared responsibility, Hyosung has implemented a comprehensive environmental protection program that aims to minimize our impact on the environment and conserve resources. Our environmental policy fulfils all requirements of the ISO 14001.



## 03 R&D

Inspiring innovation, creation and expertise

Hyosung R&D Center identifies innovation, creation, and expertise as core value, and concentrates on world class R&D activities in the 21st century with a philosophy aspiring after customer satisfaction, quality priority, and performance orientation. Hyosung pursues to be the world's best company in the field of heavy electrical machinery, industrial & electrical electronics engineering, and energy system. Ever since establishment in 1978, R&D Center had led the development of domestic technology. Along with the Anyang and Changwon labs, the group has endeavored to produce core technology and world-class products in the areas of heavy electrical machinery, energy system, electrical electronics engineering, and industrial automation system.

### Research Areas

Hyosung R&D Center engages in the activities in the field of energy system, solution & service, applied electrical and electronic technology, basic core technology, technology of improved reliability, core components, and new materials.

#### Energy System

- Renewable energy (wind system, wind turbine, wind PCS, solar system, PV PCS, fuel cell, co-generation)
- Electric Vehicle (EV charger, EV motor)

#### Solution & Service

- Power facility diagnosis algorithm and system
- Power facility lifecycle evaluation system
- Service solution for remote diagnosis for prevention

#### Applied Electrical & Electronic Technology

- Power conversion system
- Flexible AC transmission system and high voltage direct current
- Power quality solution

#### Basic Core Technology

- Fortified technology in structural dynamics, electromagnetics, heat transfer analysis, etc.
- Skills for system simulation, analysis and evaluation
- Business support technology

#### Technology with Improved Reliability

- Test data analysis and testing facility
- Analysis of lifecycle and cause of error
- Reliability assessment (environment-friendliness, durability, long-term degradation, and more)

#### Core Components and New Materials

- Organic and inorganic insulation materials
- Silicon forming technology
- Intelligent sensor (facility diagnosis, CT, PT, VT, LA, and more)



# Power Transformers

## Technology

Hyosung is the leading supplier of the power transformer industry. Starting with the development of the 154kV high-voltage transformer in 1969, Hyosung introduced the 345kV and the 765kV transformers subsequently for the first time in the country, and the sixth in the world. Hyosung's power transformers are designed to withstand all environmental hazards.

In the rated power range up to 2000MVA and operating voltage up to 765kV, these transformers have off-load or on-load tap changers to adapt them to various network conditions. Hyosung manufactures transformers under IEC, JEC, ANSI, BS and all required national standards. Hyosung offers individual solutions for satisfying requirements related to types of operation, low noise and low losses, connection technology, type of cooling, transportation, installation and so on.

### Various Types

Various types of transformers are available according to the specific requirements including single phase and three phase transformers, auto and multi-winding transformers, reactors and transformers for special applications such as furnace transformer, rectifier transformer and more.

### Fit Design

If there are any constraints related to transportation or site conditions, we can offer fit design transformer to ensure smooth shipping and installation. We also possess experience in transportation by airplanes.

### Safety

To ensure safe operation of our transformers, potential hazards are identified and eliminated at all stages. Safety during installation is ensured by extending on-site support to customers by our experienced and efficient supervisor.

### Flexible Manufacturing System

Our production flow management system is fully computerized and automatically controlled to prioritize and finalize the manufacturing schedules based on delivery dates. This system yields the most optimized use of resources and also enables us to accommodate the unexpected and/or urgent orders by customers with shorter time delivery requirements.

### Simple Handling and Maintenance

Compact design of our transformers ensure easy and smooth handling of transformers whereas Efficient design and manufacturing process and use of reliable components and accessories from reputed manufacturers ensure the trouble free operation rendering low maintenance cost of the equipment.

### Customized Solutions

Tailor-made customized transformers can also be supplied based on the specific requirements.

### Smart Grid Enabled

Design, manufacture, installation, and maintenance & repair of electric power facilities (transformer, GIS, and switchboard) are based on technology and knowhow accumulated over the past 35 years. By linking Hyosung's new preventive diagnostic system, users can diagnose the status of the equipment and schedule inspections through data received in real-time, including partial discharge and insulation oil deterioration, OLTC monitoring, insulation oil temperature, operation status of cooling fans, pumps, motor operation, and oil filter pressure.

## General

As the first domestic manufacturer of 765kV power transformers, Hyosung has earned a reputation of having the highest quality for over 40 years. We offer various types of power transformers with ratings up to 765kV. Our transformers have off-load or on-load tap changers to adapt to various network conditions and satisfy both national and international standards. We make sure that the overall quality of design, manufacturing and testing of our power transformers meet the specific specifications of each country and we offer customized services to ensure customer satisfaction.

### Production scope

- 110kV~765kV Core Form transformers
- 110kV~765kV Shell Form transformers
- 110kV~765kV Shunt reactors
- Special purpose transformers
- Shunt reactors
- Scott transformers
- Gas-insulated transformers
- Furnace transformers
- Mobile transformers

### World Class Technology and Capacity to Meet Global Challenges

- Type / Rating
- Core Form : Up to 3ph 765kV 2000MVA
- Shell Form : Up to 3ph 765kV 1500MVA



Core Form



Shell Form



Transformer Production Hall



# Design Concept



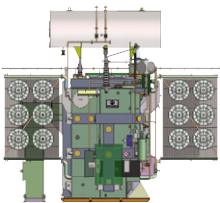
Hyosung's transformers are designed and manufactured through verification from the design stage using design program, electromagnetic field analysis program, and structural analysis program.

## Dielectric Strength

Hyosung transformers offer superior dielectric strength to withstand impulse voltage. Our advanced technology design principles ensure low capacitance between winding and the ground for proper coordination of insulating material mitigating any potential creepage issues.

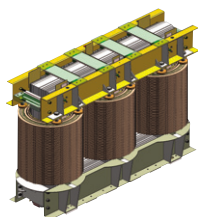
## Thermal Capability

The coils that form the electric circuit inside the transformer as well as the core material which creates the magnetic circuit must dissipate heat effectively. This heat must be released through the insulating oil which in turn radiates to the air through the cooler or radiator system. This cooling effect is vital as it is directly linked to insulation life and the total capacity of the transformer. Hyosung's transformers emphasize improving cooling performance as well as regulating the temperature of the hottest spots by using an advanced cooling system.



## Mechanical Strength

Hyosung transformers exhibit excellent mechanical strength because the design is able to distribute mechanical force evenly in event of a short circuit condition. Consideration is also given to engineering for overseas and rail transportation requirements required for delivery to the customer's site.

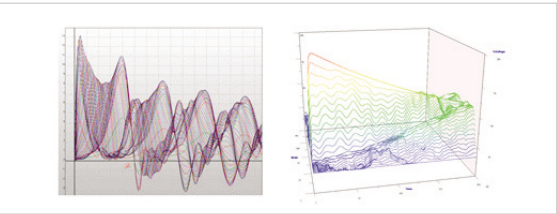


## Design and Analysis

Hyosung transformers distinctly stand out from the competition with world-class engineering and unparalleled quality. Our engineering teams use highly efficient, reliable and accurate software programs based on state-of-art techniques for preparing most optimized design to deliver the low cost and high quality products. 2-D electric field analysis for optimization of insulation structure, 3-D magnetic field analysis for determination of partial overheating and tank shield optimization and stress analysis for determination of seismic withstand and short circuit capability are few to name. Our 3-D CAD engineering system allows us to review the final product before assembly preventing errors and minimizing defects at manufacturing stage. Our dedicated R&D cell continue to research and develop innovative, efficient and cost effective designs and working towards standardization of the design parameters to reduce the lead cycle time.

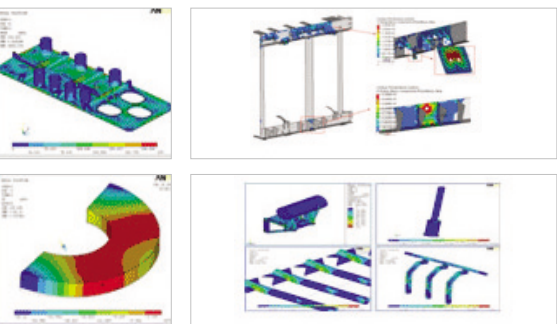
### Transient Analysis

The program uses advanced technique for calculation of the various parameters like stresses on each turns, coils and windings. The windings are divided into several segments and the actual test conditions are simulated by proper input. The program gives the values of resistance, inductance and capacitance which are further used to calculate the electrostatic stresses along the winding and determine adequacy of the insulation structure and requirement of intershielding and/or interleaving.



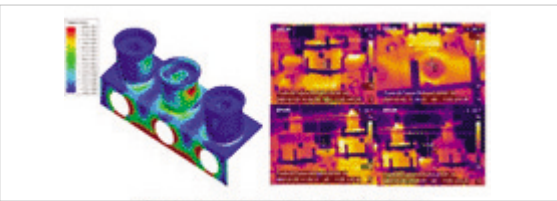
### Structural Analysis

Structural analysis is performed to ensure safe operation of the transformer and a robust construction to withstand static and dynamic forces.



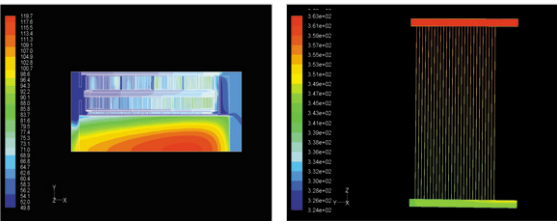
### Magnetic Field Analysis

Electromagnetic calculations are performed to describe the stray field in a transformer and to calculate transformer parameters such as impedance, losses and short-circuit forces can be made in the initial design stage.



### Thermal Analysis

Computational Fluid Dynamics (CFD) is used to understand the thermal behavior of the transformer. CFD analysis enables the designer to accurately calculate the fluid velocity, oil and winding temperature in all parts of the transformer.



## Data Management

Hyosung maintains database of its engineering schematics. By using our PDM (product data management) system, the design lead cycle time can be reduced by fetching data from existing high quality design units for reference at design stage. Our commitment to provide the transformers with best quality at most competitive price inspires us to strive for innovative research and development which in turn brings perfection to our products making us a reputed name in transformer industry.



# Products and Details



## Core Form Transformers

Core form transformer refers to the structure of locating low-pressure/high-pressure winding surrounding core to concentric circle.

- Characteristic**
- Compact structure
  - Easy assembly
  - Linear potential distribution
  - Circular form with short circuit strength
  - Easy inspection and repair

Item	Phase	Rated Voltage	Capacity
765kV Transformer	1 ph	765/345/23kV	667MVA
345kV Transformer	3 ph	345/230/13.8kV	700MVA
230kV Transformer	3 ph	245/23kV	875MVA

## Shell Form Transformers

Shell form transformer refers to the structure of layering core around winding to support winding from the circumference.

- Characteristic**
- Consistent potential distribution
  - Short circuit strength allowing for high dielectric strength
  - Outstanding cooling efficiency
  - Easy manufacturing of special transformers
  - Lay-down shipping

Item	Phase	Rated Voltage	Capacity
765kV Transformer	1 ph	765/345/23kV	667MVA
345kV Transformer	3 ph	345/230/13.8kV	700MVA
230kV Transformer	3 ph	245/23kV	875MVA



345kV Transformer



765kV Transformer



230kV Transformer



500kV Transformer



345kV Transformer



765kV Transformer



# Products and Details

## Special-Purpose Transformer

### Shunt Reactor

The purpose of installing shunt reactor is to compensate no-load/light load capacitance in long-distance EHV (Extra High Voltage) transmission system or control voltage rise caused by sudden change in load.

### Scott Transformer

Scott transformer, which is used to transfer power from 3-phase to 2-phase or vice versa, is typically used at railways and electric furnace since it is generally designed to supply 2-phase power from 3-phase power.

### SF<sub>6</sub> Gas Transformer

SF<sub>6</sub> gas transformer has no risk of explosion and fire and no damage for lives and environment even if leaks. Hyosung's SF<sub>6</sub> gas transformer has advantages on reducing rate of damp, increasing reliability and optimizing the internal and external structure of transformer.



SF<sub>6</sub> Gas Transformer

### Furnace Transformer

Load in the latter part of transformer is electric furnace in which 2<sup>nd</sup> voltage is substantially smaller than 1st voltage. Heavy amount of electric current flows in 2<sup>nd</sup> voltage

### Mobile Transformer

Mobile transformer is manufactured so that it can be assembled during installation and be delivered quickly.

It is always transported and operated in fixed conditions in a trailer.

Lately, special insulating materials suitable for high temperature are being used in the manufacturing process to satisfy transportation conditions and maximize capacity.



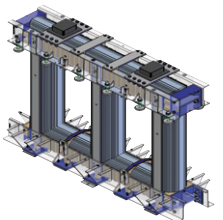
Mobile Transformer



# Compartments

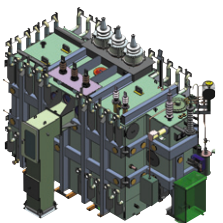
## Core

The core is layered step-by-step to maximize space ratio. The same detailed process is utilized whether the transformer being manufactured is core form or shell form design.



## Tank

The transformer tank enclosure is robustly manufactured with the necessary strength to protect all internal structures, to contain and preserve insulating oil and to withstand internal pressure during faults. Each tank is manufactured according to customer specification with manholes or hand-holes in locations to allow for simplified installation, maintenance inspection as well as repair.



## Winding

The quality of the winding material and how it is processed during manufacturing contribute greatly to the overall quality of our transformers. Hyosung's transformers apply state-of-the-art manufacturing methods for both core form and shell form using advanced materials including rectangular wire or CTC (Continuously Transposed Cable).

In addition, the winding process is completed in a dust-proof clean room with both temperature and humidity controls which meets NAS 100,000 grade.

### Core Form



### Shell Form



Pancake Winding

# Manufacturing Process



## Coil

### Core Form

Coil is designed and manufactured to withstand the impulse voltage and prevent it from distortion when a short circuit occurs. Conductors will be transposed at sufficient intervals to minimize currents and equalize the current and temperature distribution along the winding.



### Shell Form

The narrow high-dielectric strength paper is spirally wound in several overlapped layers by winding machine around each strand and layer of subdivided conductors. The outermost paper tape layer has a thermosetting coating. This bonds the coils after clamping and oven drying to insure mechanical strength and freedom from shifting of turns during assembly.



## Insulation

### Core Form

The reliability of transformers depends principally on the quality of the insulation system. The insulation system has to meet the following requirements: high dielectric strength, low partial discharge levels, mechanical stability, efficient heat dissipation and long-lasting durability.



### Shell Form

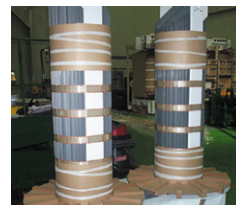
Pressboard sheets, having high dielectric strength when oil impregnated, are formed into channels, washers and spacer block assemblies. These are interleaved around and between the coils during stacking to insure adequate electrical clearances and oil flow. The pressboard insulation is only used in compression.



## Core Construction

### Core Form

The most important part of construction of core is having high permeability and low hysteresis. Structural rigidity is given to the structure material of core form's core by the use of steel plates at the bottom of the core. Therefore, distortion due to short circuit stresses or transport handling can be prevented.



### Shell Form

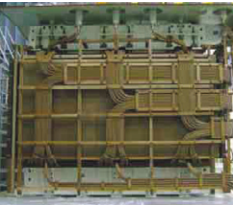
The core material is Hipersil, a cold rolled, grain-oriented, highly permeable, annealed and non-aging silicon steel that will carry one third more flux per unit area than ordinary electrical steel. Each lamination is coated with inorganic insulator.



## Core and Coil Assembly

### Core Form

Coils are sized and clamped after assembly with the core by being pressed with a special hydraulic fixture, then clamped to the end and lock plates. In the case of core-form transformer, core and coil are supported by vertically connecting leg core to lower yoke and assembling each winding to leg core where the upper tempering iron is assembled on top of the winding.



### Shell Form

The coil assemblies are lowered into the form-fit tank bottom and wedged securely in place. Hipersil laminations, stacked on fill blocks around the coils and on a T-beam through the coil openings, are applied with overlapped joints to increase mechanical strength and keep exciting current at a minimum. The core section in the coil openings are wedged at the top to compress the core and to hold the coil assembly rigid. Wedges are driven between phases, top fill blocks are positioned and vertical wood pieces, with pressboard channels that are connected between the top and bottom fill blocks.



## Tanking

### Core Form

The transformer is provided with a suitable steel tank of substantial construction which is oil-tight and gas-tight. Also, all gaskets are made of materials which do not deteriorate under service conditions. The tank has sufficient strength to withstand an internal pressure of full vacuum and vacuum drying without damage or permanent deformation. In the case of core-form transformer the joint between the tank and cover is provided with suitable flange and gaskets at top of the tank so that the assembly service is oil-tight and gas-tight.



### Shell Form

The form-fit shell form tank designed and built into a unit assembly of high inherent strength withstands the effects of vibration, handling, application of vacuum during the oil filling and prevents oil leakage with suitable gaskets. The form-fit top section, with end frames and side channels welded inside, makes the core into a rigid body when it is lowered over the wood pieces, pulled down and welded to the tank bottom.





# Total Quality Assurance

At Hyosung, our goal is not only to meet the needs of our customers today but also to provide them better life in the future.

Hyosung's total quality commitment to our customers is demonstrated by providing the highest quality product at the most competitive prices with on time delivery. Hyosung achieves these high quality levels through our integrated quality assurance program. Hyosung's products are used extensively both at home and abroad. This level of experience allows Hyosung's quality assurance and reliability to exceed those of our competitors. We share our customer's goals with high quality products. From design to assembly, testing and installation, our customer's requirements are our minimum standards. All tests are based on International standards and our customer's requirements. Through additional testing, Hyosung seeks to exceed established testing criteria, thereby producing more reliable products. Our special process operators and technicians are highly trained. Continued professional growth and advanced training are encouraged through internal training groups and outside courses. All Hyosung's products have ISO 9001, ISO 14001 and OHSAS 18001 certifications. Hyosung endeavors to maintain the highest quality.

Scope

In line with major international standards for quality assurance, the quality assurance program of our plants includes the following elements.

- Contract review
- Inspection/test control
- Design control
- Measuring and test equipment
- Procurement document control
- Storage, handling and shipping
- Material purchasing
- Nonconforming item
- Identification
- Quality assurance records
- Special process



ISO 9001



ISO 14001



OHSAS 18001

# Product Development History

Year	Milestones
2010	765kV Auto Transformer (1ph 765kV 500MVA) 875MVA GSU Transformer (3ph 230/23kV 875MVA)
2009	100MVA STATCOM
2008	IED for preventive diagnosis of Transformer (IEC61850) 765kV Auto Transformer (1ph 765kV 500MVA & 765kV 333MVA) 990MVA GSU Transformer (3ph 345kV 990MVA)
2007	SF <sub>6</sub> Gas Insulated Transformer (1ph, 154kV, 60MVA/Bank, 1.3kg/cm <sup>2</sup> )
2004	765kV GSU Transformer (1ph, 20.9/765kV 182.2/204MVA)
2003	154kV 80MVA unified power flow controller (FACTS) pilot plant

Year	Milestones
2002	SF <sub>6</sub> Gas Insulated Transformer (1ph, 154kV, 60MVA/Bank, 3.8kg/cm <sup>2</sup> )
2001	154kV 40MVA Transformer for FACTS
1999	765kV Auto Transformer for commercial use (1ph, 765kV, 2000MVA/Bank)
1997	345kV Shunt Reactor (3ph, 345kV, 100MVAR & 200MVAR)
1992	765kV Transformer (1ph, 23/765kV, 3MVA)
1986	Amorphous Transformer
1984	154kV phase-separated Transformer (3ph, 154kV, 386MVA)
1978	345kV Auto Transformer (1ph, 345/161kV, 500MVA/Bank)
1969	154kV Power Transformer first in Korea (3ph, 154kV, 40MVA)

# Global Network

- Main Offices
- Manufacturing Corporations
- Trading Corporations
- Trading Offices

