MUZARD Cécile

Faculté des Lettres, Langues et Sciences Humaines

RAPPORT DE STAGE

Master 1 Langues Etrangères Appliquées, Affaires et Commerce

Overview of Customer Activity

Année 2014-2015

université angers | FACULTÉ DES LETTRES, LANGUES ET SCIENCES HUMAINES

AGREEMENT FOR A STUDENT TRAINING PERIOD

UNIVERSITY ACADEMIC
2014/2015

ARTICLE 1 – THE PARTIES

The present agreement is concluded between :

The University of Angers represented by its President Jean-Paul SAINT-ANDRÉ

✉ http : www.univ-angers.fr

And, on behalf of the President, the constituent faculty:
UFR Lettres Langues et Sciences Humaines
Director of the constituent faculty: **Didier BOISSON**
11 Boulevard Lavoisier
49045 ANGERS
☎ +33 (0)2 4122 64 21 - ufr.lettres@univ-angers.fr

The host company: **Erlson Precision Components Limited**
4 Priorswood Place, East Pimbo

Skelmersdale, Lancashire WN8 9QB GRANDE-BRETAGNE
☎ +441695720149 🖷 +441695729181
✉ enquiries@erlson.com

Represented by **Daniel JONES**
Title/position
Sales Engineer

Department hosting the trainee :
4 Priorswood Place, East Pimbo

Skelmersdale, Lancashire WN8 9QB GRANDE-BRETAGNE
☎ +441695720149 🖷 +441695729181
✉ enquiries@erlson.com

And
Cécile MUZARD

08 bis rue Conreille

49100 ANGERS
☎ 02 31 79 61 70 ✆ 06 83 77 78 87
✉ cecile.muzard@etud.univ-angers.fr
14008027

Enrolled in :

Master 1 LEA, langues étrangères, affaires et commerce parcours stage en entreprise

ARTICLE 2 – EDUCATIONAL PURPOSE AND CONTENT OF THE STUDENT TRAINING PERIOD

2-1 Purpose of the training period

The student training period aims essentially to assure the student an appropriate experience in relation with the coursework done at the University.

In accordance with French law, article 6 of decree n°2006-1093 of August 29, 2006, "no agreement for a student training period can be concluded in order to replace an employee in case of absence, of suspension of his/her work contract or redundancy, to carry out a task corresponding to a permanent work position, to meet a temporary rise in the activity of the company, or to occupy seasonal employment".

2-2 Content of the training period

The trainee's activities are the following :
Sales Office Assistant / Assistante Ventes
Generate internal documentation, support management of prototype orders by managing the Prototype Order Matrix and individual customer order tracking documents, generate quotation folders from customers, obtain raw material quotations from suppliers, update customer information files, perform market research.

ARTICLE 3 – TERMS OF THE STUDENT TRAINING PERIOD

The present agreement takes effect from the first day of the training period and takes end the last day of the training period. It will cover the period mentioned in article 3-1.

3-1 Length of the training period

The student training period will take place from **09/03/2015** to **03/07/2015**
The number of hours each week will be: **38**

3-2 Particular cases *(please specify in case of night work, or Sunday, or holidays)*

3-3 Supervision

The student training period is subject to supervision, on the one hand from the university academic tutor, and on the other hand by the student training period supervisor in the company.

Surnames and titles/positions of persons in charge of supervision:

• For the institution of higher education : **Marie-Jose GARCIA**
Title/position : **Professeur Agrégé**

• For the host company : **Daniel JONES**
Title/position : **Sales Engineer**
☎ +441695720149 🖷 +441695726386
✉ danieljones@erlson.com

The university academic tutor and the company training period supervisor work in collaboration, and keep each other mutually informed about the state of progress of the training period and the possible difficulties.

Any difficulties encountered during the training period are to be immediately brought to the attention of the head of the degree course in which the student is enrolled.

3-4 Remuneration and benefits

3.4.1 Training programs in business and industry, non-profits and public agencies of either an industrial or commercial nature.

For training programs equal to or less than two months, it is the hiring organization's choice to remunerate the trainee.

For training programs longer than two consecutive months, the trainee must be remunerated at a rate that is set either by industry or sector standards, by extension of a professional agreement, or established by ordinance (*cf* ordinance n° 2006-757 of 29 June, 2006 as provided for under statute n°2006-1437 of 24 November 2009).

Lacking any branch or sector standard or extended professional agreement, the hourly wage to be paid the trainee is set at 12.5% of the upper hourly limit defined in application of article L.241-3 of the social security code.

3.4.2 Training programs performed in State administrative offices or agencies are not considered as being of an industrial or commercial nature.

Remuneration for programs lasting more than two months (with at least 40 actual workdays during the period) are to be calculated on the basis of 12.5% of the upper social security limit (*cf* ordinance n° 2009-895 of 21 July 2009)

The financial considerations and regulations mentioned in articles 3.4.1 and 3.4.2 are only applicable within France and its territories.

3.4.3 Benefits in kind or cash

List the benefits in kind or in cash, the means of reimbursement of expenses (transportation, meals,...)

3.4.4 Total amount of payment and means of payment (gross or net)

331.12 euros (net).

3-5 Social welfare – Civil Liability

During the the training period, the trainee continues to benefit from the health coverage on the basis of the rules of the French *Sécurité Sociale* (French national health system) for students.
Thus, he benefits from the legislation in case of work injuries, through the L412-8-2°, R412-4, D412-2 à D412-6 of the Code of the French *Sécurité Sociale*, and for accidents at the place of the student training period and during the hours of the training period, and for travel to and from the place of training and his/her domicile, as well as from the place of the training and the University.

In accordance with article 3, paragraph 6, of the French decree n°2006-1093 of August 29, 2006, "the trainee must certify that he/she has insurance covering his/her civil liability".

Name of the insurance company:
MMA SARL PICHARD GUILLOIS
N° of the insurance policy: 136688232

Address of the insurance company:
40 rue Saulnerie
14501 VIRE

Date of the subscription: 01/06/2014

3-6 Discipline and confidentiality

The student is required to submit, during his training period, to the discipline expected within the company, notably with regard to the timetable, the company rules/policies and medical examinations.

He is required to keep confidentiality concerning the documents put at his disposition.

3-7 Suspension – Cancellation

In case of difficulties in the progress of the student training period, the company training period supervisor and the university academic tutor will seek an amicable solution. In case of failure to do so, they will find means to suspend or cancel the training period.

ARTICLE 4– ASSESSMENT OF THE TRAINING PERIOD

The student training periods which are an integral requirement for the degree course, lead to an assessment that takes into consideration the appraisal given by the company training period supervisor and the university academic tutor.

The definitive mark is decided by the examining board.

ARTICLE 5 – CERTIFICATION OF THE TRAINING PERIOD

The host company delivers a certificate specifying the length of the student training period and the tasks undertaken by the trainee. This agreement is made in 3 copies.

In Angers, on 24/02/2015

The student[1]	For the President of the University and by delegation, the Director of constituent faculty	For the host company
	Pour le Président de l'Université et par délégation, La Responsable administrative Abdelmalek ZELLIOT.N	

1. If the student is a minor, the present agreement will be brought to his legal representative's attention who must give express consent to the present terms.

AUTORISATION DE DIFFUSION EN LIGNE

Authorization for online diffusion

ÉTUDIANT(E) *STUDENT*

N° étudiant : 14008027 *Student number*

Email : c.muzard@hotmail.fr *email adress*

Je soussigné(e) Cécile MUZARD *I, the undersigned* certifie être l'auteur du document *certify that I am the author of the document*

intitulé Overview of Customer Activity *entitled*

préparé sous la direction de Nathalie Merrien *prepared under the supervision of*

et soutenu le 11/09/2015 *and defended the*

Je certifie la conformité de la version électronique déposée avec l'exemplaire imprimé remis au jury, certifie que les documents non libres de droits figurant dans mon mémoire seront signalés par mes soins et pourront être retirés de la version qui sera diffusée en ligne par le Service Commun de la Documentation de l'Université d'Angers. Agissant en l'absence de toute contrainte, et sachant que je dispose à tout moment d'un droit de retrait de mes travaux, j'autorise, sans limitation de temps, l'Université d'Angers à les diffuser sur internet dans les conditions suivantes :

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À Angers, le 24/08/2015 Signature : CMUZARD

MAÎTRE DE STAGE *INTERNSHIP SUPERVISOR*

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Nom et signature du maître de stage :
Name and signature of the supervisor :

DANIEL JONES

JURY DE SOUTENANCE *COMMITTEE*

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Signature :

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ATTESTATION DE STAGE

At the end of your work placement, you are required to give a copy of this certificate to Mrs. BELLANGER (Bureau des stages).

Keep the original.

Name and address of the firm :
ERLSON PRECISION COMPONENTS LTD.
PRIORSWOOD PLACE
EAST PIMBO, SKELMERDALE, LANCASHIRE WN8 9QB.
UNITED KINGDOM

Tutor :

Mle, Mme, M. : MR. D. JONES

Position : SALES ENGINEER

Phone number : +44 1695 720 149 / +44 7824 692 847

Email : DANIEL.JONES@ERLSON.COM

Certifies that Ms/Mr :

Ms Cécile MUZARD

Preparing : **- LICENCE 3 L.E.A. (Langues Etrangères Appliquées)** ☐

- MASTER 1 L.E.A (Langues Etrangères Appliquées) ☑

- MASTER 2 L.E.A. (Langues Etrangères Appliquées) ☐

Was a trainee in my firm for (16) weeks during the period from : 9/3/15 to 3/7/15

Overall impression on the trainee : ----------

VERY IMPRESSED WITH WORK ETHIC & APPLICATION TO SET TASKS. A PLEASURE TO WORK WITH.

Date : 3/7/15

Signature of the tutor
And stamp of the firm

ERLSON PRECISION COMPONENTS LTD.

Signature of the trainee

Acknowledgements

I would like to express my sincere gratitude to the people who participated in my work placement success and who helped me over writing this report.

First of all, thank you very much to my placement mentor, Daniel Jones, Sales Engineer for giving me the opportunity to do a work placement at Erlson Precision Components. Thanks to his guidance, I have completely accomplished the missions I have been assigned.

I would also like to thank Abbi Chikh for his advices throughout my time in the company. His help has been valuable while understanding the functioning of Erlson.

Finally, my thanks go to Sales team for their welcome and team spirit.

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Introduction

From Monday, March 9th to Friday, July 3rd 2015, I carried out a work placement within an automotive components manufacturer called Erlson Precision Components Limited which is located in an industrial estate in Skelmersdale, Lancashire, United Kingdom. During four months, I have been employed by the company as a Sales Office Assistant and have joined the Sales Department. The position included a full-time job – working thirty eight hours a week – and a remuneration for the work done during this period. My placement mentor was Daniel Jones, who holds the position of Sales Engineer in the company.

First, this work experience at Erlson gave me the opportunity to discover the automotive industry that was unknown to me until then. Particularly, I have noticed that the automotive engineering sector requires a high level of performance since it is one of the most advanced industries. This is therefore a very demanding sector due to the constant technological innovation and also a very complex industry because of some quality and environmental standards to which engineering companies have to submit.

Erlson Precision Components Limited is one of the automotive engineering companies, which has been part of this sector for almost thirty years. In order to achieve economic growth and maintain its business over the years, the manufacturer has chosen to provide niche products, targeting specific market segments including the turbocharger, hydraulics and powertrain markets. The company claims to be customer-oriented, committing to complete customer satisfaction.

Throughout the entire period of the work placement, I have been incorporated in the Sales Department whose main objective is to secure more business by attracting and retaining actual and potential customers. My position essentially consisted in supporting Sales Engineer and NPI (New Product Introduction) Engineers in their daily work. I have been able to firstly observe, then learn and

finally contribute in excellent conditions to the roles of each member of the Sales team, the functioning of the Department, and in a more general way to the functioning of Erlson Precision Components.

From a general perspective, these four months I spent within the company gave me the opportunity to comprehend how an automotive engineering company such as Erlson Precision Components, in an extremely demanding and complex sector like the automotive industry, can claim to offer to its OEM and tier one customers, products and services suitable to their needs.

In order to report my 4-month work placement within the manufacturer Erlson Precision Components, it seems logical to provide first a presentation of the company including a presentation of the Sales Department. Then, the distinct missions I have been assigned will be specified as well as the different difficulties encountered and comments suggested. Finally, a comparison of the customer orientation of Erlson with some theoretical literature will be expounded.

Erlson Precision Components Ltd: Automotive components manufacturer since 1973

1. From its foundation in 1973 until today

Erlson has been part of the automotive industry since its foundation in 1973 by E.R.Lattimer. For almost thirty years, the company is acting as a subsidiary, being owned by different groups over the period.

In 1986, the company has been purchased by Hampson Industries PLC, a British provider of engineering services to both automotive and aerospace industries through various subsidiaries. The majority of their activity was focused on aerospace applications supplying transparencies, composites, plastics, machined components, aerospace fabrications and assemblies through three subsidiaries respectively named Hampson Aerospace – Fabrications/Assemblies, Hampson Aerospace – Machining and Hampson Aerospace - Industrial. The group also owned a fourth and last branch aimed to automotive applications, Erlson called at that time Hampson Precision Automotive (HPA).

During twenty five years, Erlson benefited from the strength and global presence of the Hampson group to grow and develop. The company had started its operations with a single plant based in Lancashire and then acquired a second and a third factories respectively in 1990 and 1997, and even going so far as opening a new plant in Bangalore, India, targeted to the Indian market (HPAI). In 2008, Hampson Precision Automotive employed more than 300 people and its sales exceeded £22.5m.

Since 2011, Erlson Precision Components Limited belongs to GIL Investments, a UK-based private investment firm owned by the group Grove Industries. This firm currently controls stakes in thirteen businesses, most of which are headquartered in the UK and involved in sectors classified as ‘General Industrials’, ‘Distribution’,

'Manufacturing' or 'Support Services'. Since then, the company has changed its name back to Erlson Precision Components Limited and has continued to grow and develop.

2. Company Profile

Presently, Erlson Precision Components is a specialist manufacturer of small, highly engineered components and assemblies for a range of automotive and general industrial applications. The core targeted markets are turbocharger, hydraulic and powertrain components. Its current turnover amounts to £13.5 million and has been achieved by a workforce of 219 people. The manufacturer operates worldwide as 90% of its sales are aimed to OEM and tier one customers in United States, Europe, South America and Asia.

Danny Haigh holds a position of Managing Director and manages the business organized in 9 departments namely Quality, Engineering, Operations, Supply Chain, Finance, Human Resources, Information Technology, Sales, Maintenance. *[Annex n°1, p.32]* Erlson manufacturing is carried out throughout the year from a 75.000 sq.ft. (7,000 sq.m.) facility in Lancashire divided in three units, each of which produces specific components. Steel components are produced in factory 1, brass and bronze parts in factory 2 and shafts and wheels in factory 3. This facility also houses the global centre for development and advanced engineering excellence.

Since 2003, Erlson facilities based in Skelmersdale are accredited to ISO standards[1] including ISO/TS 16949:2009, ISO 9001:2008, ISO 14001:2009, as well as worldwide OEMs approvals.

[1] These certificates are established by the International Organization for Standardization (ISO) and reviewed every five years. ISO/TS 16949:2009, in conjunction with ISO 9001:2008, defines the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products, and ISO 14001:2004 specifies requirements for an environmental management system.

In 2008, a management system called SAP has also been implemented at Erlson to manage and facilitate all the transactions within and between all the distinct departments.

3. Market position

Erlson is internationally recognized as an established supplier to global OEM and tier-one customers in passenger cars, commercial vehicles and off-highway applications. The company benefits of world-class research and development, and prototypes capabilities, particularly in small parts. Moreover, it is considered as a market leader of outsourced turbocharger shaft and wheel assemblies.

As we know, the automotive industry is an extremely demanding sector due to continuous technological innovation. Since Erlson offers high-precision components requiring the tightest and dimensional tolerances, it constantly invests in latest technology so that customers can benefit of a world-leading engineering. Furthermore, the company manufactures very specified products, called niche products intented for a restricted market segment. Thus, Erlson corporate strategy is to be customer-oriented, operating internationally and offering state-of-the-art technology at a lowest total cost.

4. Erlson Customers

Regarding its relationships with customers, Erlson Precision Components only transacts business with other companies; it is thus a Business to Business trade. The manufacturer supplies more specifically OEM[2] and tier one customers[3] mainly based in Europe, United States, South America and Asia.

[2] An Original Equipment Manufacturer (OEM) is a company whose products are used as components in another company's product. Usually, the company that sells the finished product is known as "value-added reseller" (VAR) and the OEM customizes the designs according to the VAR's needs.

Its major customers include Bladon Jets, Bosch Mahle Turbo Systems, BOS GmbH & Co. KG, Bosch Rexroth UK, BorgWarner, Continental, Cummins Turbo Technologies (CTT), Daimler, Honeywell Turbo Technologies (HTT), IHI Charging Systems International (ICSI), IHI Japan, Key Yang Precision, MHI turbos, North Devon Electronics, Pankl APC, Turbo Energy Ltd, Volvo Powertrain.

5. Erlson main competitors

Given that Erlson operates internationally, the company is in competition with automotive components manufacturers settled mainly in North America as well as in Europe and in Asia. Its competitors include Berger Holdings GmbH & Co. KG, Indo Schottle Auto Parts PVT. Ltd., Maini Precision Products Pvt. Ltd., Lindenmaier Slovakia, Strite Industries Ltd, Dial Precision Inc., Perrotton SA, Star Engineering & Machine Co. Inc, GS Brown Precision, Facts Precision Ltd, CIMOS d.d. Automotive Industry and Dalian Nakamura Precision Parts Industry Co. Ltd.

6. Products and areas of expertise

With over 60 robots, Erlson engineering competencies include: CNC turning[4], grinding[5], milling[6], honing[7] and drilling[8]; single and multi-spindle, horizontal and

[3] A tier one customer is a direct supplier to OEMs. Manufacturers sometimes refer to companies in their supply chain as tier one or tier two suppliers. The terms indicate the commercial distance in the relationships between the manufacturer and supplier.

[4] CNC Precision Turning is a machining process used to create turned parts such as bushings, or threaded bolts on a rotational milling machine, also known as a lathe. The lathe is operated by Computer Numerical Control (CNC), a process that allows for the automated or supervised control of the lathe with precise speed, location, and control of the cutting bit.

[5] CNC Grinding uses computers to control a grinder, which is a shaping device that uses abrasives to remove material

vertical lathes; state-of-the-art production systems, automation and robotics; electron beam welding[9]; metallurgy/metrology laboratories; "Lean" practices[10]; cellular manufacturing[11].

Concerning its products, it is also worth commenting that 90% of those manufactured by Erlson are aimed to the global turbocharger market for passenger cars, commercial vehicle and off-highway applications. This is the reason why the company primarily manufactures turbocharger and injector parts, as follow:

- Turbocharger parts: thrust bearings, compressor wheels, precision nuts, oil flingers, thrust collars sleeves and spacers, machined housings, journal bearings, shafts, fully balanced shaft and wheel assemblies, variable geometry components.
- Injector: `stator' and `armature' components for the injector coils.

As manufacturing processes depend on the customer requirements, we can consider that these are bespoke products.

Furthermore, as shaft and wheel assemblies constitute the majority of the turbocharger parts manufactured and sold, Erlson offers a wide range of assemblies

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[6] CNC Milling is a machining process used to remove material from solid materials. The milling machine may be oriented with either a horizontal or vertical spindle.

[7] Honing is a material removal process that uses an abrasive stone to provide a smooth surface finish.

[8] Drilling is a cutting process that uses a drill bit, which is a rotary cutting tool to cut or enlarge a hole of circular cross-section in solid materials.

[9] Electron Beam Welding (EBW) is a fusion welding process in which a beam of high-velocity electrons is applied to two materials to be joined.

[10] "Lean" Practices are systematic methods for the elimination of waste within a manufacturing system.

[11] A lean method of producing similar products using cells, or groups of team members, workstations, or equipment, to facilitate operations by eliminating setup and unneeded costs between operations

from passenger cars (compact, light and mid-sized) to commercial diesel (small, large and heavy-duty) including high pressure passenger cars (diesel and gasoline).

Among these products, thrust bearings can be made of brass[12], bronze[13] or sintered iron and manufactured from sintered or forged blanks as well as bars. Journal bearings can also be made of brass, bronze or aluminium and manufactured from tubes, solid bars or castings. The remaining products namely steel[14] components are made of super alloys -e.g. nimonic, alloy steel, stainless steel, Carbon steel- and manufactured from solid bar, forged blanks, hard and soft manufacturing.

7. Sales Department

During four months, I did a work placement within Erlson sales department. The first thing to be aware of is that it does not work as a typical sales department, insofar as the majority of the Sales team does not carry out sales activities.

Sales team is officially composed of the Sales Engineer, Daniel Jones, who was also my placement mentor; the Project Manager, Scott Murisson; the NPI Engineering Manager, Ian Caunce who direct the NPI (New product introduction) team. This is made up of NPI engineers namely Adam Wilson, John Culshaw, Phil Charnock, Chris Hegginbotham, and a Development Line Supervisor, Kieron Tilley. *[Annex n°2, p.33]* In practice, Daniel Jones is the only employee strictly speaking who carries out sales activity.

Nevertheless, all these people are settled in the same office, which is an open space, each with personal computer and phone line, using SAP management system for transactions. All are working in team every day as each has a role to play in making the process work.

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[12] Brass is an alloy of copper and zinc.

[13] Bronze is an alloy of primarily copper and other metals, usually tin and sometimes arsenic, phosphorus, aluminium, manganese and silicon.

[14] Steel is an alloy of iron and carbon.

8. Main positions of the sales department

As Sales Engineer, Daniel Jones is in charge of maintaining the relationship with customers, which involve overseeing all customer activity from a commercial standpoint - by understanding the market, customers and competitors.

As Project Manager, Scott Murisson is supervising delivery of PPAP (Production Part Approval Process) samples to Borg Warner Turbo Systems, then following through the PPAP until the parts are released for serial production and finally supervising quality and delivery performance to all divisions of the manufacturer. Given that orders from BorgWarner represent one of the biggest growth areas for the business outside shafts and wheels in the last 18 months, it has been decided to have a specific manager for this customer.

As NPI Engineering Manager, Ian Caunce manages and drives technical support and strategic direction to the NPI team and also ensures that the Sales department meets agreed KPI's (Key Performance Indicators) and customers' requirements.

9. Function of the sales department

Overall, the primary function of the Sales department is to generate customer quotations according to their requirements and with a competitive price, and finally secure more business with actual or potential customers.

First, the Sales Engineer Daniel Jones or the Managing Director Danny Haigh receive customer RFQ (Request for quotation) via e-mail, and then evaluate it with the NPI Engineering Manager Ian Caunce to determine whether it is of interest to Erlson, considering the type of product, pricing, expected volumes and dates. If the RFQ is declined, the Sales Engineer shall inform the customer. If the RFQ is accepted, the Sales

Engineer creates a quote folder on the Sales drive for the customer, referencing a quotation number and containing all the relevant documentation (drawings, material specifications, manufacturing terms and conditions…).

Secondly, NPI Engineers determine the general manufacturing method taking into account the volume and quality requirements of the component. They may contact the customer to request changes to be made to drawings or specifications to facilitate manufacture. A general costing should also be carried out estimating manufacturing costs taking into account cycle times, set-up times, batch quantities, subcontract processes e.g. heat treatment, as well as any costs for specific tooling, fixtures, gauging, material handling and packaging. Then, the feasibility requirements form will be completed and the production controller has to be consulted to confirm that capacity is available for the proposed manufacturing method and volumes required by the customer.

Once costings sheets is completed, the Sales Engineer generates a formal quotation to submit to the customer, including the piece part price per yearly volume, tooling and gauging costs, DFM proposals and the general Erlson Terms and Conditions. If the quotation is acceptable, and the customer issues an order to Erlson in line with what has been quoted, the Sales Engineer generates a new work order (WO) number along with an Internal Sales Order (ISO). The ISO, with all the relevant documentation is then issued to the relevant staff (GM, AEM, Technical Manager, Quality Engineers, NPI Team) in order to begin Quality and Manufacturing planning procedure.

In addition, it should be specified that if there is any changes required by the customer, it is the responsibility of the Sales Engineer to inform all people involved in the project and to initiate ECN (Engineering Change Notification) into system. As customer quotations are generated according to customers' requirements, the Sales Engineer may also be asked to obtain customer satisfaction data.

Sales Office Assistant position

During my placement period, I joined the Sales team within the office, with a personal laptop at my disposal. I had my own email address to contact suppliers, customers and colleagues, as well as my own access to SAP management system to conduct sales transactions.

As a Sales Office Assistant, I attended most of the time Daniel Jones, the Sales Engineer and my placement mentor. My role consisted in supporting him and NPI team in their daily work. I therefore participated in team work and carried out co-responsibility missions. I was in charge of tasks gradually important with more responsibility. Nevertheless, as some of them were one-off and without any great interest, I chose to introduce only the most typical tasks I realized in my position as follow:

1. Generate internal documentation

- **Generate quotation folders**

Upon receipt of requests for quotation (RFQ) from new and potential customers, a new quotation number must be allocated in the Sales enquiry log. This document is an Excel sheet in which all the RFQs received are listed indicating for each: the day of receipt, the person responsible for it at Erlson – the Sales Engineer, Daniel Jones most of the time or the Project Manager Scott Murisson, the final result -project quoted, declined or cancelled, the customer, the name of the project, every parts number – knowing that one quote number must be created for one part number, a target price – that can be found on SAP with transaction MCV6 for parts registered in the system, the day internal response has to be done, the day response to customer has to be sent. Usually, an answer must be provided to the customer four weeks after receipt of the request except if a certain deadline is required, and the internal response must be available the week before so that Sales team can review it. Overall, this list of RFQs allows everyone to be aware of the quotations Erlson has to provide in time.

Once the quotation number is allocated, a quote folder must be created in the Sales Drive, in the respective customer folder. All the relevant documentation provided by the customer is copied including emails (internal and external conversation), drawings, customer or international material specifications, manufacturing terms and conditions… As well as a quotation form *[Annexe n°3, p.34]*stating yearly volumes, prices, raw material used, and costing sheets –one per part number – that will be completed then by the NPI Engineers to determine the manufacturing methods and costs. Consequently, during four months, I was in charge of creating every quote folder needed upon receipt of RFQs, obtaining additional literature from the customer when missing. I was also asked to keep informed by email all the engineers involved in the project of the quotation indicating the due date and if there is, of any changes regarding it.

Usually the Sales Department receives RFQs from current or new customers by email. However, for some of them such as BorgWarner, Continental or Bosch Rexroth, requests are received on the Supply On platform. This central online platform aimed to manage business processes between manufacturing firms, suppliers and service providers across continents in a structured and secured manner, as all the relevant documentation is protected. Consequently, Erlson establishes online businesses with customers submitting bids on the platform upon receipt of RFQs. For these customers, I therefore had to connect to the platform with Daniel Jones access and download the documents.

In addition, I have contacted BorgWarner and the customer service website to register Erlson as official supplier on the WebEDI. This Supply On service is necessary to establish an ASN communication (Advanced Shipping Notification) so that both companies can exchange all the relevant documentation for delivery and locate schedules.

- **Raise internal sales orders (ISO)**

Upon receipt of order from a customer, an internal sales order (ISO) *[Annexe n°4, p.35]* must be completed with all the relevant information provided by the

customer – one ISO per work order- such as the work order (previously generated by the Sales Engineer, Daniel Jones), part number, quantity, price, date of delivery, person who placed the order at the customer. Then, the ISO sheet is saved in the customer folder named with the WO and date, and part drawings related downloaded in the drawings folder. Once the ISO is raised, first, people involved in the project are informed by email of the new ISO, sent with the part drawings including the work order, delivery place and date as well as all the related important information. Secondly, all the documents (ISO, customer order and parts drawings) are printed and staple together in order to be classified in the relevant customer binder. Every customer has binder gathering information such as previous orders, ISOs, official suppliers used, prototypes sent etc.

- **Create purchase requisitions**

Upon receipt of a customer purchase order, purchase requisitions must be created on SAP system with transaction ME51N.This document consists of a number of items (material or service) containing for each the quantity and delivery date of the material to be provided or the quantity of the service to be performed. It also indicates the account assignment category (cost centre or not), material group, GL account, value, requisitioner (the person responsible for the requisition at Erlson), desired vendor (supplier). As every supplier is registered on the system with a number and the item prices may change throughout the year, it is important to check the item price with transaction ME12 and the number of the supplier with transaction ME03. There are three types of procurement: indirect expenditure (expense purchasing), direct expenditure (procurement of standard materials) and external processing (external production operation). All purchase requisitions go through an approval process prior to purchase order creation. Consequently, I was in charge of creating purchase requisition and then ask the Financial Director, Paul Clarkson to release it, indicating the supplier and requisition number. Finally, I had to inform the receptionist Diane Caroll, of the new requisition in order to create the purchase order and send it to the supplier so that it can know that the process begins.

- **Create standard orders**

Upon receipt of customer purchase order, standard orders must be created on SAP system using transaction VA01. This document is proper to Erlson and contains the same information used on the customer purchase order, including the sold-to-party – the customer who placed the order, the ship-to-party – the party whom the business will deliver the material, customer purchase order number, the date, Erlson material number, quantity and the customer material number. Then, it can be output as PDF for email to customer.

- **Create customer quotation upon receipt of raw material quotation**

Once the quotation is received from the supplier, costings and quotation form must be completed. The quotation form contains the price of raw material indicating the name of the supplier and the price per minimum batch quantity (MBQ).

2. Search raw material quotations

Once a quotation folder is created, raw material quotations must be searched and obtained from current or potential new suppliers.

For frequent quotations received in the past, I was therefore asked to contact and request quotation from Erlson current suppliers. For instance, Leeds Bronze Engineering is an Erlson actual supplier for bronze bars such as High Tensil Brass bars used frequently to produce bearing bushings for off-highway applications.

For some new quotations, I was in charge of searching on the Internet and finding potential new suppliers liable to produce the material required by the customer. For example, Bismuth Tin Bronze bars made of continuous castings were required by a customer to produce journal and thrust bearings. However, this alloy is a specified one, hard to find while not commercially available in all the Brass and Bronze foundries.

The method used to find new suppliers is to search and list all the suppliers liable to manufacture the material required and then call for bids. Usually, I created a

typical email asking for quotation with all the relevant information about the material including part drawings and material specifications required by the customer. It is worth mentioning that any reference to the customer in the part drawings provided to potential suppliers has to be deleted. Then, this email has also to be sent separately to the distinct suppliers to avoid conflicts of interest. Finally, Sales Engineer Daniel Jones, Managing Director Danny Haigh and Advanced Engineering Manager Ian Caunce evaluate the different quotations and usually chose the most competitive and efficient. Sometimes, tenders can lead to a partnership with Erlson. Once a quotation has been chosen, I had the responsibility to provide a feedback to suppliers (positive or negative) and to copy the selected quote in the relevant customer folder.

This task includes being organised, diplomatic and able to persevere in searches. The main challenge was always to find material so that the quotation meets customers' requirements. Consequently, I learned how to write professional emails, how to chase suppliers up when no answer, how to make them wait patiently and how to answer to their questions about manufacturing methods.

3. Create internal market report

During the first month, I have been asked to create an internal market report on the global turbocharger market from two reports previously found and purchased on the Internet, namely *Global light vehicle turbochargers market – forecasts to 2029*, January 2015, Just-Auto and *The automotive turbochargers and superchargers report*, February 2015, IHS Business.

My mission here was to combine both reports pulling out all the relevant market data that could be useful to Erlson. During three weeks, I gathered all the information such as the trends and opportunities of the global turbocharger market, the distinct turbocharger markets in the world (Europe, North America, Asia) – including for each one diagrams with estimate production by types of turbochargers, market shares and forecasts. Technologic innovations have also been listed. Moreover, I performed suppliers profiles dividing major players on the global market from the minors located

on regional markets. In these profiles, it has been detailed for each supplier the sales information, turnover, main customers, corporate strategy, acquisitions and investments concerning turbochargers, technologic innovations and turbochargers manufactured, regional and global market shares and forecasts. *[Annexe n°5, p.36-37-38]*

Concerning this combined report, the challenge for me was to understand both reports as I didn't have any knowledge of automotive engineering and sector. One of the other difficulties was to summarize all the information, knowing that the IHS business report was more detailed than the Just Auto report – and to identify the most useful data to Erlson.

Eventually, the main objective of this combined report was to analyze and monitor the developments of the global turbocharger market so that Erlson can adapt their services to the trends of the market and the actual or potential customers' needs.

4. Update customer and competitor information files

During two weeks in my work placement, I updated Erlson customers and competitors' information files from 2006 with up to date data from searches including information released on their respective website, reading reports on the automotive market and news articles.

- Customers Profiles Account sheet brings together all the relevant information concerning Erlson main customers such as the date of establishment, target markets, customers, competitors, turnover, market shares (global and local), current production and forecasts, facilities, purchasing goals, current issues/hot topics Erlson has with its customer and vice versa. These two last categories were very hard for me to complete as it concerns customer satisfaction and actual or previous contract negotiations, which had not been recorded. *[Annexe n°6, p.39-40-41]*
- The Global Competitors Power Point collects information about their current situation including the date of creation, products manufactured – particularly in

common with Erlson, turnover, number of employees, ISO Certificates acquired, global locations of their business, customers, website and contact details. *[Annexe n°7.a.b., p.42-43]*

Solutions to the main problems raised

For four months spent in the Sales department, I performed the above-mentioned tasks with different degrees of ease and rapidity. Of course, I encountered some difficulties in my daily work: some related to my position and skills required for it that I overcame and others regarding the organisation of the Sales activities and department, for which I will suggest some possible solutions.

1. Lack of knowledge in engineering

Throughout the entire period of the work placement, the main problem I experienced was that I did not have any knowledge in automotive engineering and sector. During the first days, this shortcoming did not interfere with my ability to learn how to use the SAP system, considering that this calls on my computer skills acquired during my studies. Nevertheless, I discovered that it may probably put me at a disadvantage in my future work, as all Sales team members are engineers. Consequently, after one week at Erlson, I had been asked to combine two reports about the Global Turbocharger Market as I already mentioned in the previous part. First, I performed research on turbochargers in order to get acquainted with it and understand its functioning, features, the benefits and disadvantages of its use when fitted on gasoline or diesel engines. In addition, it seemed necessary to list all the technical terms specific to automotive engineering, particularly essential to the understanding of technical innovations.

Furthermore, this lack of knowledge in engineering caused problems when finding potential new suppliers. Usually, customers require certain materials which are indicating on the part drawings. However, these can be made of different processes:

high pressure die casting[15] is used to produce bearing housings, continuous casting[16] to produce bars etc. They can also be made of different alloys e.g. high leaded tin bronze, stainless martensitic steel. The different alloys can be named by their chemical composition (high leaded tin bronze: CuSn7Pb15) or by a standard designation which depends on the country (LBC4 in the United Kingdom, UNS 93800 in the United States, SAE67 in Italy…), which are called equivalents. Regarding the first customer quotations, I spent some time to find potential suppliers because I didn't know that the parts were manufactured from different processes and made of distinct alloys. The most important here was to have a list of the alloy required by the customer and its equivalents, which I finally received from my mentor Daniel Jones. Moreover, it was necessary to conduct research with distinct designation in order to avoid missing out on some suppliers, who are based closer to the company than others and able to provide the material required. In rare cases, some alloys may be specific and untraceable as they are not commercially available everywhere. This is the reason why it may be asked to the customer to use a similar one e.g. LM6 instead of LM9 (Aluminum material). However, it is preferable to find the one required to meet customer requirements.

For all the tasks carried out during my placement, I therefore reached to compensate this lack of engineering knowledge by questioning members of Sales team as well as doing some research individually/on my own.

2. Create a list of suppliers for raw material quotations

Also related with search of potential new suppliers, as Erlson Sales department receives customer RFQs, I had to contact more and more suppliers and sometimes even the same supplier for distinct raw material quotations. The main challenge for me here

[15] High pressure die casting is a metal forming process in which molten metal is forced into a cavity or mold under high pressure.

[16] Continuous casting is a metal-forming technique in which a semi-finished product (such as an ingot or a tube) is continuously solidified while being pored in a mold, and its length is not dependent on the mold's dimensions.

was to be organized. Given that this process usually lasts several weeks, I found it necessary to list all the suppliers contacted so that Daniel Jones or I could follow the evolution/monitor the development of my search over time.

As a result, I have created an Excel sheet indicating all the relevant information for each provider: the country, name, website, contact email address (which is generally the person responsible for sales), customer quote number, material required (with distinct designation) and material dimensions required. The last column specifies the result of the contact: if the supplier has provided an answer or no, if I should chase them up, if the material has been quoted or declined and any changes suggested by the manufacturer. This document enables the Sales Engineer or me to not forget any suppliers as well as not confuse several quotes. *[Annexe n°8, p.44]* Besides, considering that I finished my work placement before raw material quotations were selected by the Manager Director, Danny Haigh, and the Sales Engineer, Daniel Jones, I left them this document so that they can be informed of my search and continue with it.

In my opinion, it would be preferable to list every supplier contacted depending on the customer quotation. For instance, it would be interesting for Erlson to create one list for the steel suppliers, one for the bronze and brass foundries etc, to keep the quotations and contact details of every supplier who submitted a quote that has been refused by the company. This process would allow Erlson to contact first the suppliers they know they are able to provide the material when the current supplier for economic reasons is not able to trade anymore or when it is in out-of-stock.

3. Make a note of all the current issues

As stated in the above part, when I updated the Customer Profiles Account sheets, I was unable to complete the two last categories, namely purchasing goals and current issues as it concerned customer satisfaction and actual or previous contract negotiations. At Erlson, customer satisfaction data is recorded by the Sales Engineer, Quality Engineers and Planning and Logistics Personnel. The Manager Director, the Sales Engineer and the NPI Engineering Manager are also directly in contact with

customers, so they are well placed to receive customer feedback about Erlson quality and services.

Concerning the customers, as Erlson is a customer-oriented organization, it would be better to make a note of every issue mentioned in the customer satisfaction surveys and negotiations as well as reporting it in the profiles regularly.

4. The update of data

Concerning the last two tasks I was asked to perform, namely create an internal market report and update the customer and competitors information files, I was surprised that these documents had not been updated. Before finding and purchasing the two reports on the Global Turbocharger Market on the Internet, I have been provided with an example of report from 2010 at Erlson. In addition, I updated Customer Profiles Accounts and Competitors Power Point from 2006.

As Erlson Precision Components is part of the automotive industry which is in constant evolution, I believe it would be in the company's interests to update every year all the data related to the global market, technical innovations, customers and competitors. It should be specified that these tasks are normally not realized by a member of Sales team because of a lack of time and that this is the reason why I was in charge of them.

III. Theoretical comparison

1. A customer-oriented automotive industry

"In the twenty-first century, cars should be designed and engineered to be in harmony with people and nature." (Automotive Engineering, Lightweight, Functional and Novel Materials, Chapter 1, p.3)

Indeed, nowadays, manufacturers have to provide vehicles that meet customers' demands and social requirements. On one hand, customers ask for improving fuel economy, benefiting from a good quality/price ratio. On the other hand, environmental and safety concerns are growing gradually such as reducing exhaust gas emissions, conserving oil resources and improving crash safety. As these issues call for technological enhancements, product innovations remain essential in the automotive industry. Actually, not only vehicles manufacturers (passenger cars, commercial vehicles, off-highway vehicles…) but also all players acting in the manufacturing process of vehicles have to innovate in order to finally meet customers and social requirements. Cooperation among material suppliers, parts suppliers and carmakers is therefore becoming increasingly important and necessary.

It is worth noting that the automotive industry "once dominated at a product level by engineering and a management level by finance [has become] a cross functional, customer oriented industry." (Customer Retention in the Automotive industry: Quality, Satisfaction and Loyalty, Michael D. Johnson,Andreas Herrmann,Frank Huber,Anders Gustafsson, published in 2012, consulté le 30 juillet 2015) As a result, a company has to adopt a customer orientation to remain part of the automotive industry.

Given that Erlson Precision Components is an automotive components manufacturer, the company is customer-oriented and committed to complete customer satisfaction.

“Understanding links from quality, to satisfaction, to loyalty, to retention has become a key to financial and organizational success as the automotive industry enters the millennium”. (Customer Retention in the Automotive industry: Quality, Satisfaction and Loyalty, Michael D. Johnson,Andreas Herrmann,Frank Huber,Anders Gustafsson, published in 2012, consulté le 30 juillet 2015)

According to this book, customer satisfaction belongs to a chain of four concepts namely quality, satisfaction, loyalty and retention. “Quality is free” (Philipp Crosby, 1979) refers to the idea that it will payback its cost and brings more money to the organization because customers are sensitive to quality improvements. If these have a positive effect on customers, they are considered as satisfied. Then, “Satisfaction is profitable” (Fornell and Al. 1996) suggests that a satisfied customer is more likely to remain with a firm, which over time, lows costs and increases revenues to increase profitability. Here, we are concerned by customer satisfaction, broadly defined as an overall perception of their purchase and consumption experience. However, it seems that only extreme levels of customer satisfaction can lead to customer loyalty. This is defined as a “psychological predisposition toward repurchase”. Customer satisfaction decreases complaints, decreases in sensitivity to price increases, increase in word-of-mouth and referrals as well as in customer purchase intentions. Consequently, the more satisfied is the customer, the more likely to repurchase he is. Finally, customer retention is “the actual act of repurchase”. Between customer loyalty and retention are changing customer needs, competitive pricing strategies, availability of new technologies.

As a result, to achieve customer retention which is the final objective, an automotive company must continuously find new and better ways to satisfy customer needs and benefit from customer loyalty into distinct repurchases, which demand to understand satisfaction and quality factors

2. Erlson Precision Components Ltd

Concerning Erlson Precision Components, the company applies this theory. In addition, it focuses its business on a niche market, which suggests that the competition is not as tough as in the global automotive industry and that there are fewer existing customers. Nevertheless, its strategy is not even customer-oriented but customer-based as parts are manufactured according to customers' requirements (drawings, material specifications…).

Given that quality is related to "subjective perceptions of value and expectations", the quality of the products and services offered by Erlson is perceived by its customers according to theirs demands. Knowing that they are OEM and tier one customers, it is worth recalling that they are submitted to quality and environmental regulations as Erlson acquired ISO standards to certify its quality and environment commitment. The quality of products is perceived first when prototypes and final products are received and used by the customer. The quality of services is perceived when providing a quotation that meet customer's requirements, to the extent possible, as well as when delivering, providing customer service, maintaining professional relationships between both companies etc.

Considering that the manufacturer has built its business on customers and that "only extreme levels of satisfaction create loyal customers", it seems essential to ensure complete customer satisfaction and to identity causes of "customer defection", also called customer dissatisfaction. Within Erlson, a process for determining, reporting and reviewing customer satisfaction is defined and operated by distinct members within Sales, Quality, Logistics and Operations Departments. This allows discussing what product or service processes have to be changed or improved.

"Satisfied customers are more likely to remain with a firm, which over time, […] increases revenues", usually by ordering additional products or services or by increasing in purchase volume. Erlson successfully implemented this aspect of profitability. For instance, BorgWarner Turbo Systems is one of the old partners of

Erlson as well as a customer who orders over 70 parts, which represent one of the biggest growth areas for the business outside shafts and wheels in the last 18 months. This customer therefore benefits from a personalized service knowing that Scott Murisson is the Project Manager mainly for this manufacturer. Moreover, it is a leading global supplier of engineered systems and components for powertrain applications, and thus one of the leading manufacturers of turbochargers for the passenger cars, sports-utility vehicles, commercial vehicles and off-the-road vehicles. Operating worldwide from its several divisions, dissatisfaction from this customer would spread a negative word-of-mouth and reduce referrals to other divisions or OEMs, decrease in customer purchase intentions and thus in probability to be a loyal customer.

Eventually, most of the time, not only Erlson Precision Components manages to satisfy its customers but also achieved to customer retention. BorgWarner, IHI Corporation, Cummins are some of its partners since more than fifteen years. Besides, Cummins recently order parts that Erlson has already manufactured in 2008.

Conclusion

Erlson Precision Components Ltd is an automotive components manufacturer, based in the United Kingdom and part of the automotive industry since almost thirty years. This is a customer-oriented organization, which is committed to complete customer satisfaction. Indeed, the manufacturer benefits from a profitable niche market as 90% of its products are aimed to the global turbocharger market, which is expected to grow in the future. It also presents a competitive advantage that allows making itself indispensable to OEM and tier-one customers: offering custom products, manufactured upon their requirements. Over the years, the company knew how to initiate action and anticipate compared to other manufacturers. It continues to develop and invest in Research and Development so that it could offer state-of-the-art technology processes that customers are likely to need in the future. This provides to Erlson a better adaptation to customers' needs that leads to a better customer loyalty and retention.

First, throughout the entire 4-month period, working at Erlson within the Sales Department has been a pleasure and an extremely rewarding experience for me, as Erlson staff and especially my placement mentor, Daniel Jones have been satisfied of my work.

As a Sales Office Assistant, I have joined the Sales team and have participated in the creation of customers 'quotations upon RFQs, which is the first step in customer satisfaction at Erlson. Therefore, I created the internal sales documentation and searched for new potential suppliers able to provide the material required by customers and with which Erlson may develop a partnership. I have also contributed to overview customer activity from a commercial standpoint by analyzing the Global Turbocharger Market, Erlson customers and competitors.

The main difficulty I encountered during this work placement was my lack of knowledge in automotive engineering, as already mentioned in the second part. This

has slowed me down when accomplishing given tasks and has also proved that a relevant knowledge is essential to work in such a specific sector like the automotive industry and even more in a company targeted to a niche market such as Erlson.

Finally, working at Erlson has been a very instructive experience insofar as I have improved and developed competencies both personally and professionally.

At a personal level, I was pleased to note the full freedom I had to carry out the given tasks as well as the responsibilities. This allowed me to achieve more confidence, autonomy and to learn to take initiatives. In addition, I discovered the automotive industry, a sector completely unknown to me before this work placement. The knowledge I acquired on automotive engineering is basic and constitutes a self-enrichment to the extent that it will not be useful in my professional future, as I would not like to continue in this sector.

At a professional level, this work placement enabled me to put the skills acquired during my studies into practice. I have successfully improved my level of English and acquired a specific vocabulary related to automotive engineering. By using the SAP Management System and Microsoft Word and Excel, I have called for my computer skills. Moreover, I have developed my research competencies when finding new suppliers and materials along with finding engineering information essential to the understanding of market reports and daily tasks. Eventually, writing a combine report on the Global Turbocharger Market has helped me improve my writing skills as well as my ability to analyze and synthetize data.

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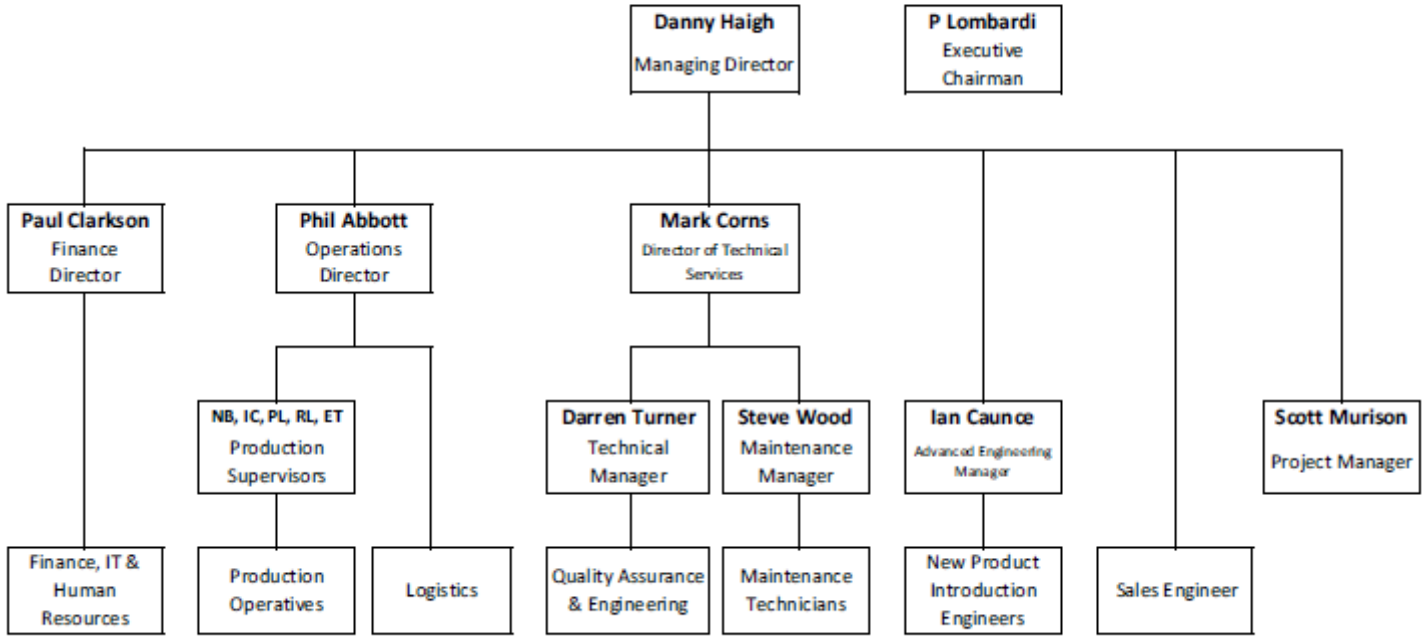
Annex 1: Erlson Organisation Structure

ERLSON
Precision Components

Erlson Precision Components Ltd
Organisation Structure - Jan-15



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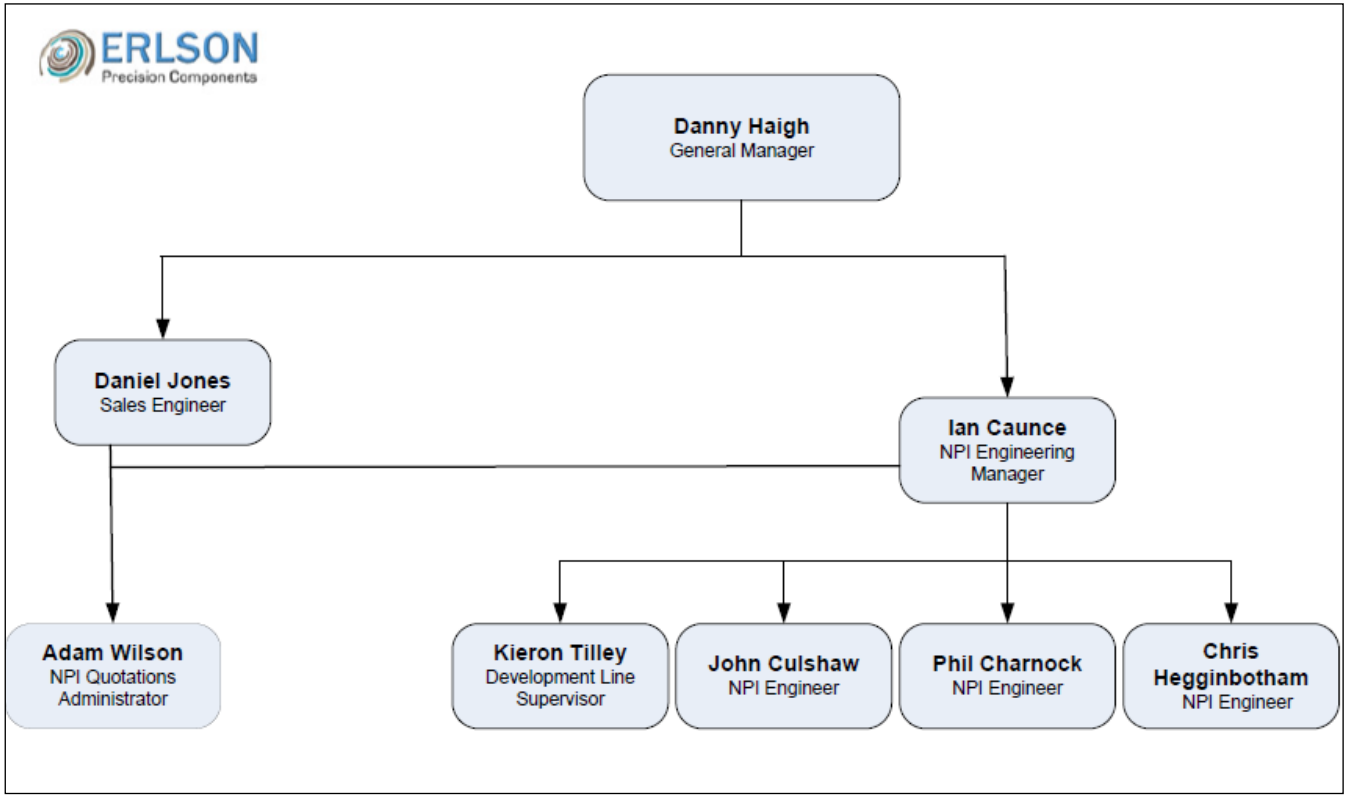
Annex 2: Sales Department Structure



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Annex 3: Blank Quotation Form

ERLSON
Precision Components
Erlson Precision Components Ltd.
Priorswood Place , East Pimbo
Skelmersdale, Lancashire
WN8 9QB, United Kingdom
Tel: +44 (0) 1695 720149
Fax: +44 (0) 1695 729181

Dat: 25/07/2015
Quotation Reference:

Customer:
Prepared for:

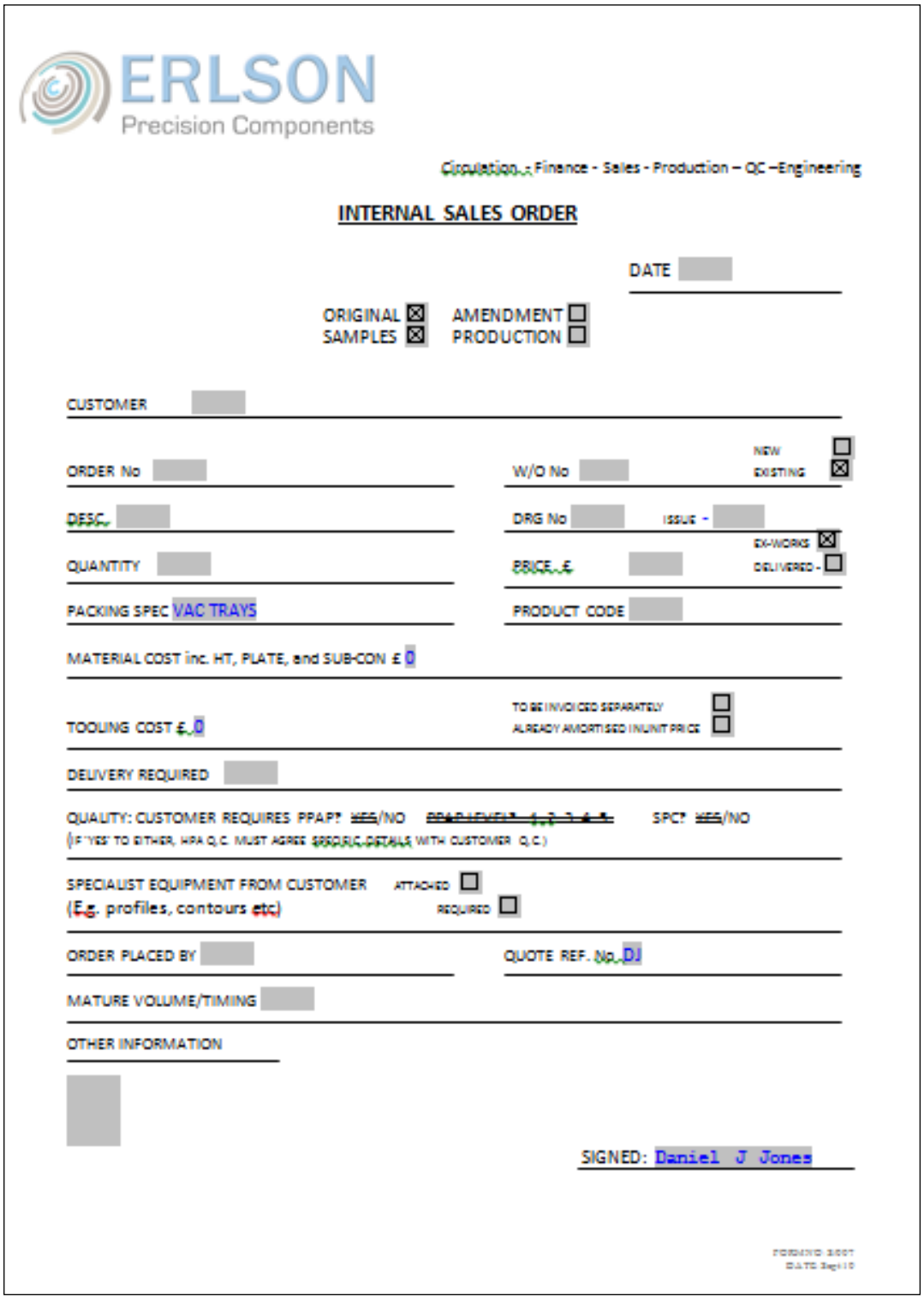
Quote Number	Part Number	Description	Volume	Selling Price	Material	MBQ

Notes:

1 Tooling & Gauging - TBA, technical solution will be rechecked if pricing structure offered is attractive.
2 Quotation based on proposed finish machining processing times from machine tool supplier.
3 Material Escalator Mechanism to be in place in line with LME to be reviewed at time of order and quarterly from start of series production.
4 SOP Lead Time - Estimated 16 weeks from point of order.
5 All prices are Ex Works.
6 Payment Terms - 30 days end of month.
7 Quotation valid for 30 days from date of issue.

All other normal Erlson Precision Components terms of business apply

Annex 4: Blank Internal Sales Order



ERLSON
Precision Components

Circulation :- Finance - Sales - Production – QC –Engineering

INTERNAL SALES ORDER

DATE

ORIGINAL ☒ AMENDMENT ☐
SAMPLES ☒ PRODUCTION ☐

CUSTOMER

ORDER No | W/O No | NEW ☐ EXISTING ☒

DESC. | DRG No | ISSUE -

QUANTITY | PRICE £ | EX-WORKS ☒ DELIVERED - ☐

PACKING SPEC VAC TRAYS | PRODUCT CODE

MATERIAL COST inc. HT, PLATE, and SUB-CON £ 0

TOOLING COST £ 0 | TO BE INVOICED SEPARATELY ☐ ALREADY AMORTISED IN UNIT PRICE ☐

DELIVERY REQUIRED

QUALITY: CUSTOMER REQUIRES PPAP? YES/NO ~~PPAP LEVEL? 1, 2, 3, 4, 5~~ SPC? YES/NO
(IF 'YES' TO EITHER, HPA Q.C. MUST AGREE SPECIFIC DETAILS WITH CUSTOMER Q.C.)

SPECIALIST EQUIPMENT FROM CUSTOMER ATTACHED ☐
(E.g. profiles, contours etc) REQUIRED ☐

ORDER PLACED BY | QUOTE REF. No. DJ

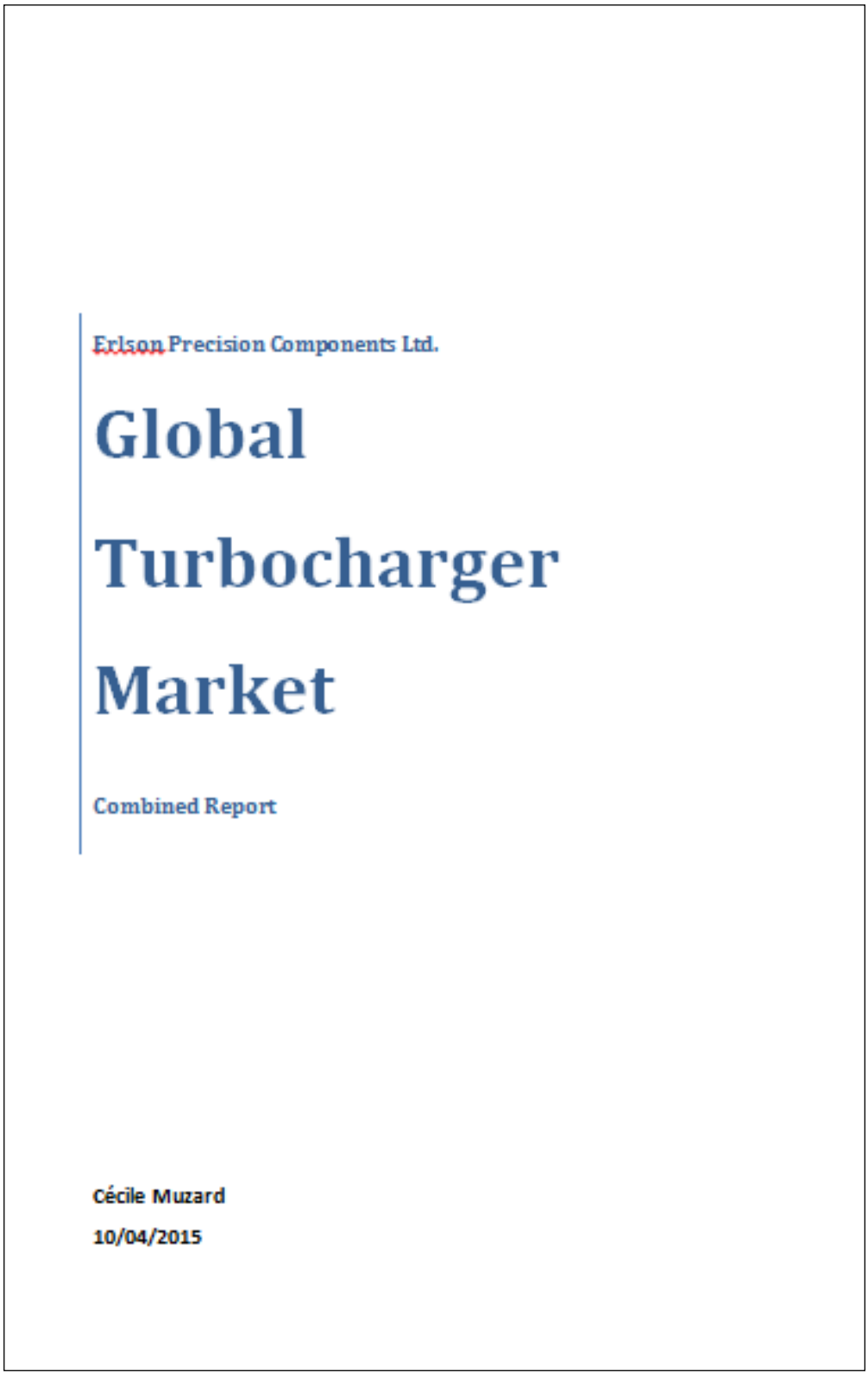
MATURE VOLUME/TIMING

OTHER INFORMATION

SIGNED: Daniel J Jones

ISSUED: 3/07
DATE Sept 10

Annex 5: Combined report, *The Global Turbocharger Market*, 10/04/2015



Erlson Precision Components Ltd.

Global Turbocharger Market

Combined Report

Cécile Muzard

10/04/2015

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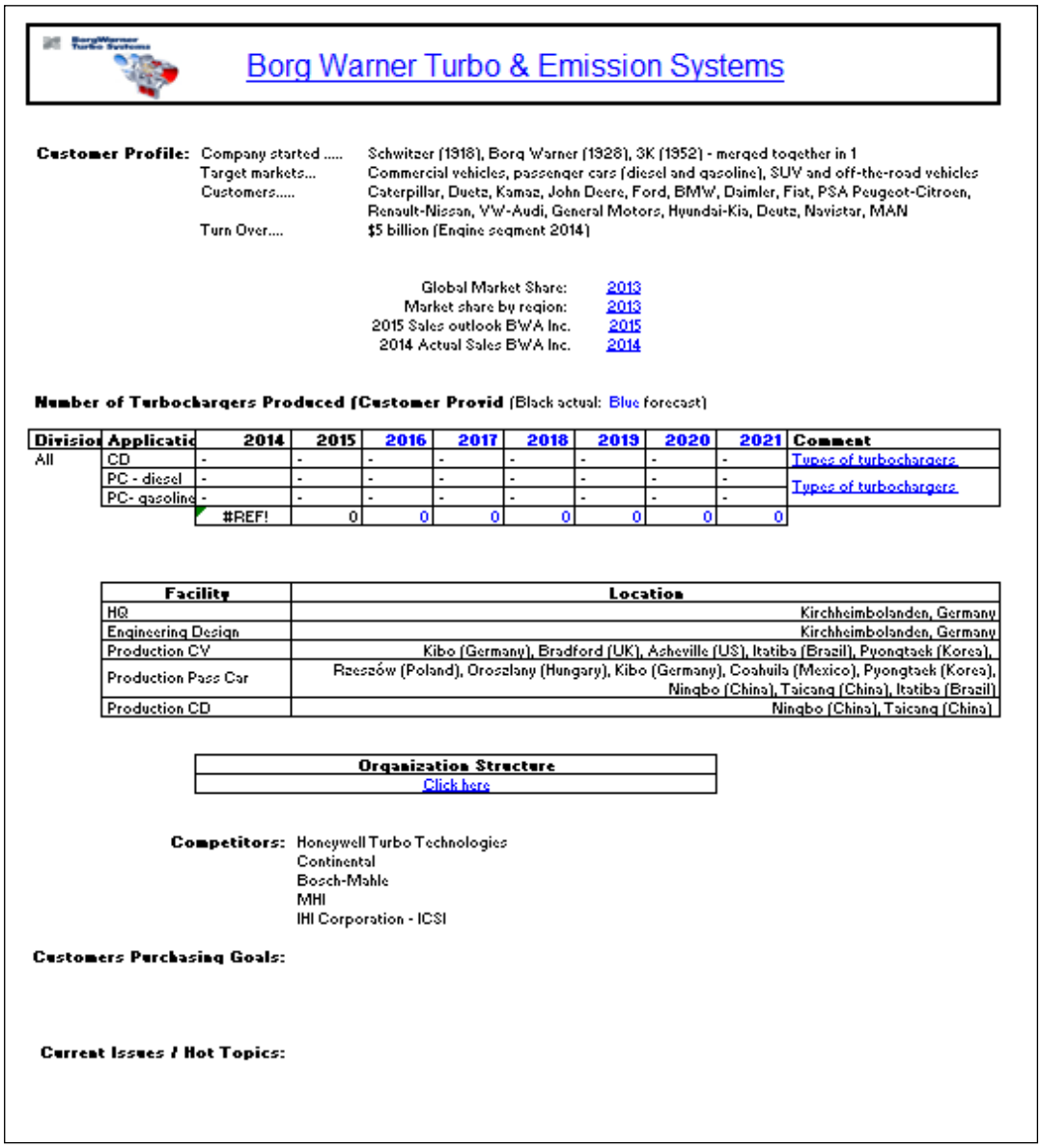
Annex 6: Example of Customer Profile Account, BorgWarner Turbo Systems



Borg Warner Turbo & Emission Systems

Customer Profile:

Company started	Schwitzer (1918), Borg Warner (1928), 3K (1952) - merged together in 1
Target markets...	Commercial vehicles, passenger cars (diesel and gasoline), SUV and off-the-road vehicles
Customers.....	Caterpillar, Duetz, Kamaz, John Deere, Ford, BMW, Daimler, Fiat, PSA Peugeot-Citroen, Renault-Nissan, VW-Audi, General Motors, Hyundai-Kia, Deutz, Navistar, MAN
Turn Over....	$5 billion (Engine segment 2014)

Global Market Share:	2013
Market share by region:	2013
2015 Sales outlook BWA Inc.	2015
2014 Actual Sales BWA Inc.	2014

Number of Turbochargers Produced (Customer Provid (Black actual: Blue forecast)

Divisio	Applicatic	2014	2015	2016	2017	2018	2019	2020	2021	Comment
All	CD	-	-	-	-	-	-	-	-	Types of turbochargers
	PC - diesel	-	-	-	-	-	-	-	-	Types of turbochargers
	PC- gasoline	-	-	-	-	-	-	-	-	
		#REF!	0	0	0	0	0	0	0	

Facility	Location
HQ	Kirchheimbolanden, Germany
Engineering Design	Kirchheimbolanden, Germany
Production CV	Kibo (Germany), Bradford (UK), Asheville (US), Itatiba (Brazil), Pyongtaek (Korea),
Production Pass Car	Rzeszów (Poland), Oroszlany (Hungary), Kibo (Germany), Coahuila (Mexico), Pyongtaek (Korea), Ningbo (China), Taicang (China), Itatiba (Brazil)
Production CD	Ningbo (China), Taicang (China)

Organization Structure
Click here

Competitors:
Honeywell Turbo Technologies
Continental
Bosch-Mahle
MHI
IHI Corporation - ICSI

Customers Purchasing Goals:

Current Issues / Hot Topics:

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Global market shares for turbochargers 2013 (%)

Company	Triad %	Global %
Honeywell	45	40
Borg Warner	25	23
IHI incl. ICSI	10	8.5
Continental	6.5	6
Bosch-Mahle	5	4.5
MHI	4.5	4
Others	4	14
Total	100	100

Source: just-auto

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European market shares for turbochargers 2013 (%)

Company	%
Honeywell	50
Borg Warner	27
IHI/ICSI	8.5
Continental	7
Bosch-Mahle	5.5
Others	2
Total	100

Source: just-auto

North American market shares for turbochargers 2013 (%)

Company	%
Honeywell	49
Borg Warner	32
Continental	6
Bosch-Mahle	5
IHI	4
Others	4
Total	100

Source: just-auto

Japanese market shares for turbochargers 2013 (%)

Company	%
IHI	48
MHI	43
Honeywell	3
BorgWarner	2
Others	4

Source: just-auto

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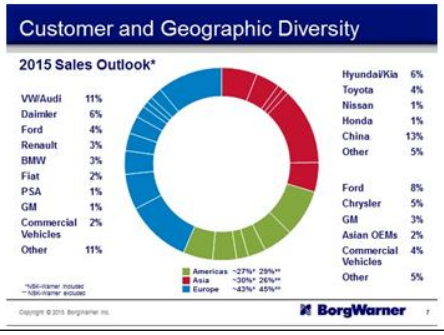

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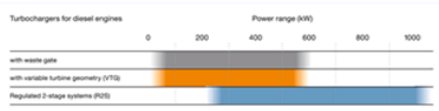

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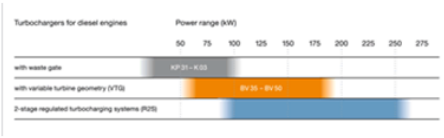

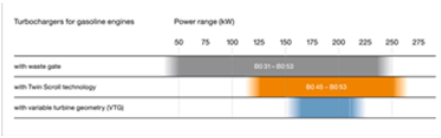

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BorgWarner Inc.

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Non-Executive Chairman of the Board,
BorgWarner Inc.
Managing Partner, Juniper Investment Company, LLC

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Vice President, President, and General Manager, BorgWarner Turbo Systems

Annex 7.a: Erlson Competitors Power Point, 2015

GIL Investments

ERLSON
Precision Components

Global Competitors

1

Purpose of Data Collection

- To have basic data available of major competitors;
- To form the basis for competitor data pool;
- To provide initial data source for further competitor analysis;
- To identify our position in the market place relative to our competitors and develop our own cutting edge.

2

Annex 7.b: Example of Erlson competitors, Perrotton SA

Perrotton SA

- Established in 1966
- Manufactures components parts in the Automotive industry for: injection system, turbocharger, gear box, power steering, electrovalves, braking, EGR.
- Turnover of 2015 about €60 Million/over £43 Million; 300 employees
  Annual production: 85 million parts sold in 17 countries
  Annual bar consumption: 13 000 tones
- Products relevant to ours: steel parts
  Certificates ISO 14001 and ISO 16949:2009
- Customers Include Bosch, Delphi, Honeywell, BWA, Continental, Schaeffler, GM, Renault, Thyssenkrupp, TRW.
- Website: www.perrotton.fr
- Contact means:
  Tel no: 0033 (0) 4 50 97 03 09
  900, avenue de Pontchy
  74130 BONNEVILLE – FRANCE

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Perrotton SA Awards

- ✓ Quality Supplier of the year cup from Renault - 2009
- ✓ The Pinnacle Award for Supplier Excellence from Delphi - 2010

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Annex 8: Suppliers List

Country	Supplier	Website	Contact details	Q2985-2988	High Leaded Tin Bronze LBC4/93800 - Journal Bearings ø21/32" - 17 mm 3m length" 20 bars
UK	William Lane	http://www.williamlane.co.uk/home.html		Declined, only produce short lengths	
	Monkman Foundries	http://www.monkmanfoundries.com/	Steve Moxon [info@monkmanfoundries.com]	No answer	
	Taylors Foundry	http://www.taylorsfoundry.co.uk/		No answer, fowarded the email to Copper Alloys	
	Abbey Spun Cast	http://www.abbeyspuncast.co.uk/index.php	on the website	Declined, don't produce bars	
	Leeds Bronze	http://www.leedsbronze.co.uk/	Johnny Trolley (Does not work anymore there)	Will provide a feedback once usual alloys are backup and running at usual place	
	Advanced Alloys	http://www.advancedalloysltd.co.uk/index.htm	sales@advancedalloysltd.co.uk	No answer	
	Copper Alloys	http://www.copperalloys.net/	Ben Turner [ben.turner@copperalloys.net]	**! Did answer to discuss with DJ because Erslon already refused to trade with this company in the past, prices were too high**	
	Boegra	http://www.boegra.com/en/	Ashley Geddes [geddrep@btconnect.com]	Declined, don't produce this alloy	
	Mersey Metals	http://www.merseymetals.co.uk/	David Thompson [davidt@merseymetals.co.uk]		No answer
	Holme Dodsworth	http://www.holmedodsworth.com/	Kevin Fletcher [kfletcher@holmedodsworth.com]		Quoted
			Trev Bough [tbough@holmedodsworth.com]		
	Otto Fuchs	http://www.otto-fuchs.com/en/home.html	Mike Rowan [mike.rowan@veseysales.co.uk]		Quoted
			Poth, Katharina [Poth.Ka@Otto-Fuchs.com]		
India	Conex Metals	http://www.conexmetals.com/index.htm		No answer	
Germany	MMHB	http://www.mmhb.de/en/index.php/contact	Klein, Stefan [sklein@mmhb.de]	Declined, don't produce this alloy	
France	Le Bronze Industriel	http://www.lebronzeindustriel.com/index.php?lng=en	Richard Monckton [rmonckton@lebronzeindustriel.co.uk]	Declined	
Italy	Scilla Meccanica	http://www.scillameccanica.it/en/contacts	'info@scillameccanica.it'	No answer	
USA	NBM Metals	http://www.nbmmetals.com/	Robin Flores [rflores@nbmmetals.com]		No answer
			Flor Cruz [fcruz@nbmmetals.com]		
	Anchor Bronze & Metal	http://www.anchorbronze.com/	Anchor Bronze & Metals, Inc. [sales@anchorbronze.com]		Quoted
	Dura Bar Metal Service	http://www.dura-barms.com/	Rorig, Joel [RORIGJ@dura-barms.com]		No answer