North America Plants

Supplier Quality Contract

Supplier Acknowledgement

As a supplier of materials, components, and/or processes used in the manufacturing of PRETTL's products, I acknowledge that:

I received a copy of the Supplier Quality Contract and accept its content and terms.

Signature	Print Name
Company Name	Title
Date	

It is required written confirmation or comments within 5 working days, after the issue date. If Prettl doesn't receive written confirmation or comments between following 5 working days Prettl assumes that this agreement was accepted by the supplier

Table of contents

Introduction

1.0 General

PRETTL has earned a reputation for providing products at consistent quality, competitive prices and flexible production. Our ability to maintain this reputation greatly depends on the quality of the production materials purchased from our suppliers. For this reason, Prettl considers its suppliers valuable assets for the achievement of quality objectives.
Prettl's goal is to work closely with both new and existing suppliers to ensure that the quality level of products and services provided by each supplier meet Prettl specifications, requirements, expectations, and satisfaction.

We have set our supplier goals to zero defects and 100% on time delivery, and with cooperation and open communication with our suppliers, we can achieve these goals. This contract is a significant step in developing an open communication, by defining our quality, delivery and responsiveness expectations. It is our hope that, as a result of this contract, there will be an improved, cooperative relationship between PRETTL and its suppliers.

We at Prettl are conscious of our environmental footprint and thus continually strive to be environmentally friendly. For this reason, we are certified to the ISO 14001 Environmental Standard. It is our expectation that suppliers will minimize their environmental impact by being compliant to the ISO 14001 standard.

2.0 Scope

This contract will apply to all PRETTL´s supplier base including distributors of catalog and "shelf" items. Compliance to the requirements within this contract as well as to the general terms and conditions are mandatory for all suppliers.

Specific terms and conditions may be provided by each plant via the purchasing or supplier quality organization, based on specific needs of each of our North American facilities.

It is the user's responsibility to assure that only the latest revision of this contract is used available from the following website:

http://www.prettl.com/fileadmin/prettlus/info/suppliers/

Purchasing

1.0 General

Manufacturers in the supply chain are compelled by the OEM's to reduce lead times and costs. Suppliers with short lead times, competitive prices and flexible shipping abilities enable Prettl to offer customers the dynamic partnership they have come to expect. Through long term, constructive relationships with suppliers, Prettl continuously looks for opportunities to improve the flow of material and information, and ultimately to reduce costs and lead times.

2.0 Purchase Orders/ Order Confirmations

Prettl issues purchase orders based on Prettl terms and conditions and requires written order confirmations of purchase orders within 5 working days after the order date**. If no written order confirmation has been received within 5 working days the supplier implies acceptance and agreement with the purchase order.**

Order confirmations serve to acknowledge the formation of a contract between the supplier and Prettl based on Prettl terms and conditions. Any reference to the supplier's quotation, bid or proposal does not imply acceptance of any term, condition or instruction contained in such document. Any invoice, acknowledgement or other communication issued by the supplier in connection with the purchase order shall be construed to be for record and accounting purposes only. Any terms and conditions stated in such communications shall not be applicable to the purchase order and shall not be considered to be the supplier's exceptions to the provisions of the purchase order.

The supplier agrees to ship material to Prettl in compliance with the specifications provided on the purchase order:

1. Part number(s)
2. Supplier part number(s) and description
3. Engineering and packaging specifications
4. Pricing
5. Quantity
6. Ship date
7. Terms of shipment
8. Carrier
9. Payment terms
10. Other specifications on the purchase order

Any deviations of an order confirmation from a purchase order must be accepted by Prettl prior to shipment. An unaccepted deviation from purchase order requirements will be viewed as a supplier non-conformance, additional costs arising from supplier non-conformance can be debited to the supplier.

3.0 Commercial Documentation and Payment

One copy of the commercial invoices or packing list must be attached to the shipment.

For invoicing address, contact Information and specific country details:

Refer to Appendix C

3.1 Packing Slip

The packing slip must contain the following information:

1. Purchase order number(s)
2. Prettl part number and part description in English
3. Quantity and unit measure of the parts shipped
4. Gross and net weight of the shipment
5. Package forwarder tracking number (where applicable)

Notice: MSDS Sheet Included with Packing Slip (where applicable)

3.2 Invoice

Invoices must contain the following information:

1. Purchase order number(s)
2. Packing slip number
3. The country of origin
4. Prettl part number and part description in English
5. Price and currency for each line item
6. Quantity and unit measure of the parts shipped
7. Gross and net weight of the shipment
8. Material adjuster calculation if applicable

Parts listed on one packing slip may not be invoiced on several invoices.

3.3 NAFTA and AALA documentation

Prettl is obliged by customer requirements and U.S. law to obtain, on an annual basis, information on the country of origin of components used in the production of its finished products. These requirements are a result of the North American Free Trade Agreement (NAFTA) and the American Automotive Labeling Act (AALA). Prettl will approach suppliers for the respective documentation as needed.

Quality

1.0 Quality System Requirements for suppliers

PRETTL maintains conformity to IATF 16949. For this reason, we are required to develop and manage our supply base.

At a minimum you shall be third party registered to the current requirements of ISO 9001, with the ultimate expectation of certification to IATF 16949. PRETTL's goal is to have all Supplier's registered to IATF 16949. Supplier development is available for those requesting such assistance.

All suppliers must conform to the current applicable statutory and regulatory requirements in the country of receipt, the country of shipment, and the customer-identified country of destination, if provided. All suppliers must also conform to all supplied customer specific requirements.

2.0 Definitions

Shall	Indicates a mandatory requirement
Should	Indicates a preferred approach
Product	Any product, part, or service provided to Prettl
Supplier	Supplier to Prettl
PPAP	Production Part Approval Process
FMEA	Failure Mode and Effects Analysis
PPM	Parts per million

3.0 Documentation

3.1 General

Relevant documentation is a part of every purchase order submitted by Prettl. This documentation may include, but is not limited to:

Blueprints
Bills of Material
Order Specifications
Other supporting specifications/ documentation (DIN, ANSI, etc.)

3.2 Special Characteristics

Special Characteristics are characteristics determined by Prettl or its customers that require special manufacturing controls to assure compliance with specifications. The presence of special characteristics is not to diminish the importance of other specifications, rather, it is to identify those specifications that shall be part of any control plan for the production of the part, unless otherwise stipulated in writing by Prettl, the data resulting from the control of the special characteristics should be maintained by the supplier and should be available for submission and/ or review by the Prettl Quality Assurance Department.

3.3 Reference Documents

The following is a list of AIAG documents referenced in this contract:

Document	Description
IATF 16949 and ISO 9001	Quality System Requirements
APQP	Advanced Product Quality Planning
FMEA	Failure Mode and Effects Analysis
MSA	Measurement System Analysis
SPC	Statistical Process Control
QSA	Quality System Assessment
PPAP	Production Part Approval Process

To obtain a copy of these reference documents, contact:

Automotive Industries Action Group – AIAG

www.aiag.org

3.4 PPAP/ PSW Submission

Prior to shipment of product to Prettl, PPAP approval must be established either by Prettl or its direct customers, for each relevant revision level of the product being supplied.

- If PPAP approval is performed by a customer of Prettl, or a directly related party other than Prettl, (such as the OEM), a signed, approved PSW must be submitted to Prettl prior to shipment of the product to Prettl. Supplier shall send the full package of PPAP documentation that had been submitted to the customer with PSW for approval by Prettl.

- Level 3 Submission is default, or another requirement may to be allowed upon request and approved by Prettl prior to shipment of the product to Prettl. Samples must be provided upon request along with any other data deemed necessary to ensure full disclosure of process capability at the supplier.

- If PPAP approval is not performed by a customer of Prettl, or a party other than Prettl, (i.e. OEM), a PPAP must be submitted to Prettl. Level 3 Submission is default, or another requirement may to be prepared (upon request) and approved by Prettl prior to shipment of the product to Prettl. Samples must be provided on request.

- All PPAP's must conform to the latest version of the AIAG PPAP contract.

- All PPAPs must include an International Material Data System (IMDS) submission. No submission "warning (s)" will be accepted.

Submission to Prettl Electric Corp: # 49969
Submission to Prettl Components Michigan LLC: # 49969

In order for Prettl to have proper time for approval of planned changes, notification is required at least 90 days before process changes, change of manufacturing locations, change of materials, etc… are planned to occur. See AIAG's PPAP latest version on the Section 3.1 for complete requirement.

Note: For 3.4 PPAP/PSW Submission it applies for Automotive projects and for other Prettl´s Business Units apply also approval process with specific requirements.

3.4.1 Supplier Changes

Suppliers shall notify Prettl of any design, process or location changes as indicated in the cases provided below.
Upon notification, Prettl will provide documentation and PPAP requirements and any additional specific direction to proceed with the specific change (s).
Notification shall be provided to the corresponding Prettl buyer at the facility where the products are delivered and the purchasing department at usgv.purchasing@prettl.com
Multiple notifications are required in cases where several Prettl locations are served.
PPAP submittal and approval is required prior to shipment of the modified product or product from the modified process.
The supplier is responsible in giving sufficient notice to Prettl to ensure that the supply chain is not impacted negatively. Under no circumstance will the supplier effect unilateral changes without Prettl's approval.

Cases where notification is needed:

1. Use of other material than was used in the previously approved part or product.
2. Production from new or modified tools dies, molds, including additional or replacement tooling whenever the integrity of the final product can be impacted.
3. Production following improvements in performance, capacity and / or process flow changes to existing tooling or equipment.
4. Production from tooling and equipment transferred to a different plant site or from an additional plant site.
5. Change of subcontractor for parts, non – equivalent materials, or services such as heat-treating or finishing.
6. Product produced with tooling that has been inactive for serial volume production for twelve consecutive months or more.
7. Product and process changes related to components of the production product manufactured internally subcontracted.
8. Changes in testing and inspection methods, testing equipment, or new testing techniques. Validations will have to be provided to show that there is no effect on acceptance/rejection criteria.

Cases for bulk materials:

9. Change to the source of raw material from a new or the existing sub-supplier.
10. Change in product appearance attributes.
11. Change in equipment, process technology new to the organization and not previously used for this product.
12. Tooling or equipment moved within the same plant when its original intent is not of a mobile type and that requires no realignment, leveling or any type of capability validation..

3.5 Process/ Supporting Documentation/ Contractual Requirements

When required, the supplier shall submit supporting documentation as evidence of control of process and/ or control of specified material. This supporting documentation should come in the form of Certificates of Conformance/ Compliance, Material Certifications, and SPC data (see section for SPC requirements).

The required supporting documentation is an integral part of the Prettl purchase order. Missing documentation will be viewed as a non-conformance and may result in a rejection of the shipment.

The supplier shall to label the first production that containing information like new engineering level change and change description on each individual sub pack and palled purchased, prior to shipment of the product to Prettl.

Any 3rd party agreements that may have impact to Prettl's 0 PPM goal and any quality aspect of delivered goods must be disclosed at the time of quote and no later than at the time of PPAP. This includes and is not limited to test results, tolerances not called out on drawings or specifications, agreements accepted elsewhere by other supply chain members. None of these "separate and undisclosed" agreements shall relieve the supplier of the responsibility to deliver products that comply with our 0 ppm requirement.

4.0 Quality System Audits

4.1 General

Prettl Supplier Quality Assurance shall perform quality audits of the supplier's manufacturing process as deemed necessary.

4.2 Conditions for Auditing

Conditions that may warrant a quality audit include, but are not limited to:

- Quality Issues/ Performance
- Engineering/ Process Changes
- New Supplier/ Part Number

4.3 Audit Criteria/ Scope

Scope and criteria for any announced audit will be communicated to the supplier prior to the actual audit.

5.0 Nonconformance, Corrective/ Preventive Actions

5.1 Requirements

Upon notification of a "Non-conformance" of material, the supplier shall initiate the following actions:

1. **Initial Containment**

   Level I Containment action shall be implemented within 24 hours of formal notification by Prettl (written or verbal). Any verbal notifications shall be followed by written documentation of the concern. Level I Containment actions shall include all affected material in the supplier's possession, in transit to Prettl, and affected finished goods shipped to Prettl's customers. Failure to have successful Level I containment will lead to Level II containment.

2. **Initial Response**

   A written response to the non-conformance shall be submitted to the relevant Prettl Quality Assurance Engineer within 24 hours (or otherwise agreed upon timeframe) of formal notification of the concern. This initial response shall document as a minimum:
   - Prettl Complaint Number
   - Prettl Quality Assurance Engineer
   - Concern Description
   - Containment Action Description
   - Date and Identification of Certified Material
   - Root Cause Analysis Status

   Implementation of due dates and assigned responsibility shall be documented with any action listed.

   Repeat issues or an unsatisfactory response and / or corrective actions will lead to Level II containment.

3. **Corrective Action Report**

   A formal corrective action report shall be submitted to Prettl within 10 working days (or otherwise agreed upon timeframe) of formal notification of the concern. Implementation due dates and assigned responsibility shall be documented with any action listed. Verification of effectiveness should be documented as the final reporting step. Unsatisfactory response and / or corrective action will lead to Level II containment. Prettl prefers a standard 8-D format for submission of corrective actions with full root cause analysis description. See appendix B for additional tools and instructions.

4. Documentation

FMEA's, Control Plans and other relevant documentation shall be revised to reflect the actions resulting from the concern. Relevant updates are to be noted in the formal corrective action report. Depending on the effect of the actions on the process or product (i.e., revision level changes), a PPAP submission may be required prior to additional shipments. These documents shall be maintained on file and are to be provided to Prettl Supplier Quality Assurance upon request.

Please visit Appendix A for Description of Containment Requirements.

Supplier Evaluation and Development

1.0 General

Prettl's objective is a close cooperation with suppliers to ensure that the quality level of received product meets our requirements and expectations and that delivery performance is maintained at an acceptable level. The supplier shall be evaluated by Prettl Purchasing and Supplier Quality Assurance, in regards to their ongoing quality and delivery performance.

2.0 Performance

Prettl Purchasing and Quality Assurance periodically conduct supplier evaluations to determine supplier ratings based on quality (goal = 0 defects), delivery performance (goal = 100% on-time), and supplier responsiveness.

Failure Cost

Prettl reserves the right to debit to the supplier any additional costs incurred due to supplier or product non-conformance. Debit amounts are calculated based on the following scale:

Production Disruptions:

Line Shutdown	$ 600/hr/line
Production changeover	$ 1200/incident

Sorting:

Preparation (sort/ rework/ setup/ training/ material handling/ booking)	$ 30/hr
Sorting of material (receiving/ incoming/ warehouse/ in process/ finished goods)	$ 30/hr

Rework:

Setup/ Training/ Booking	$ 30/hr
Rework activity	$ 30/hr
Tooling/ Equipment	$ 30/hr
Testing/ Inspection	$ 30/hr

Additional Costs:

Scrap (Components, semi-finished, finished goods)	As incurred
RTV value	As incurred
Packaging/ Warehousing/ Handling	$ 30/hr
Additional warehouse receipts (split shipments)	$ 100/incident
Freight charges/ Premium freight charges	As incurred
Engineering	$ 60/hr
Administrative charges	$ 300/debit
Other charges (e.g. customer failure costs)	As incurred

Note: Due to Prettl's global presence, sorting costs will be reevaluated based on competitive rates at the location where the sorting needs to take place.

Packaging and Labeling

1.0 Introduction

1.1 Purpose

To provide a clear definition of packaging and labeling requirements for Prettl suppliers.
This packaging guideline is provided to assist suppliers in meeting Prettl objectives for packaging, transportation and material handling. Suppliers must adhere to the basic requirements listed in the following sections in the development of their packaging.

1.2 Scope

This standard applies to all production material shipped to Prettl facilities.

1.3 Partnership

Packaging development requires partnership. It can only function as intended if both supplier and customer work together from proposal to implementation. Moreover, it is essential that both parties adhere to the approved packaging standard. An open, two way communication is key.

In special cases, Prettl may require that a packaging form be filled out and provided for approval by our engineering and quality departments. The form will become an integral part of the purchased product contract.

2.0 Supplier Responsibility

2.1 General Statements

- The supplier is responsible for the packaging of materials to assure their proper condition and quality upon delivery to Prettl and its continual improvement.
- Packaging shall not be a source of contamination. Containment (e.g. plastic bags) may be required.
- Packing is part of the supplier manufacturing process and shall be included as appropriate in the FMEA, Quality Plan, where these “tools” are employed. Where applicable, additional packaging and labeling requirements will be communicated on purchase order.

2.2 Packaging proposals

All packaging modifications require approval by Prettl prior to shipment.

2.3 Mechanical requirements

The packaging must be suitable for the agreed mode of transportation and must be able to withstand "real world" load conditions for handling and transport. If packaging is not suitable for stacking, attach label "do not stack."

2.4 Returnable:

Prettl welcomes any efforts to establish a returnable container packaging system. A separate agreement is required.

3.0 Packaging Requirements

3.1 Mode of Transportation

Packaging should protect material against "real world" loading, handling and transportation conditions:

- Shock proof
- Secure packaging
- Damage proof
- Environmentally resistant

3.2 Packaging Requirements

Strapping: Prettl prefers polyester strapping for material that is palletized with multiple containers. Strapping must be tight to prevent any shifting or damage. Where possible, edge strap caps should be used to prevent damage from strapping.

Corner Boards:

- As needed to protect the package.
- Place corner boards on every corner (except bottom) under the straps.
- Fasten the straps so that the boxes are fixed and solid.
- Required for pallets that can be stacked.

Stretch Wrap:

- As needed to protect the package.
- Wrap horizontally, include all containers, overlapping at top and bottom.

Double/Triple Wall Cardboard:

- Required for large, single container, palletized material.
- Wall thickness must be sufficient to protect material.
- Corrugated (paper fiberboard) packaging material, must have sufficient strength to withstand transportation. Recyclable material is requested.

Packaging Weight and Dimensional Restrictions:

Pallet-Load Dimension

	Face x	Depth x	Height
Footprint Size*:	48” (1150mm)	45” (1220mm) AIAG Standard	51”(1295mm)
	32”(760 mm)	30” (820mm) AIAG Standard	40”(1016mm)
	1200mm	1000mm European Standard	1000mm
	1200mm	800mm European Standard	1000mm
	44”(1120mm)	36”(915mm) BOSCH European Standard	40”(1016mm)

*Height restriction: Includes pallet

*No material shall extend over the pallet edge.

- Maximum weight per shipping unit = 2000 lbs. (909kg), higher weights must be identified on outside of package.
- Maximum weight per sub-package (e.g. bags) = 30 lbs. (13.6 kg).

Pallet Style:

- Pallets must be sufficiently large to accommodate load without overhanging containers.
- Pallets must of a solid construction to prevent damage.

Welded Plastic Bags are encouraged as internal protection and may be required to protect parts from contamination by or exposure to the environment. If plastic bags are used as the primary container, they must contain a label identifying the parts (see labeling requirements in section 4).

Mixed Loads must be separated in sub packs and identified.

Wooden Packaging Material: To reduce the spread of pests that affect plants and plant products, the International Plant Protection Convention (IPPC) adopted new regulatory standards in March 2002 for the treatment of wood packaging material used in international trade. These standards are outlined in Guidelines for Regulating Wood Packaging Material in International Trade ISPM Publication Number 15: www.ippc.int

The standards affect all wood packaging material used in exporting that contains unprocessed, raw wood.

Effective September 16, 2005, wooden packaging materials (e.g. pallets, crates, boxes and dunnage) imported into the United States and Mexico must be heat treated or fumigated with methyl bromide and marked with the International Plant Protection Convention (IPPC) logo and appropriate country code designating the location of treatment.

For additional details to go to the following internet website:

U.S. Customs and Border Protection (CBP) regulation: www.aphis.usda.gov

Mexican Secretariat of the Environment and Natural Resources: www.semarnat.gob.mx

XX represents the ISO country code.
000 represents the unique number assigned by the national plant protection organization.
YY represents either HT for heat treatment or MB for methyl bromide fumigation.

Example of appropriate pallet marking.

4.0 Labeling Requirements

General Requirements: Information and identification data described below is required for all packages. Prettl requires the use of printed/ written labels containing the required information on **each individual sub pack and palled** purchased. The use of AIAG bar coded labels is encouraged, but not required.

Location:
- Labels must be attached in a location that is clearly and completely visible without manipulation of the container.
- Labels shall be placed on the outward facing side of each container on a pallet (except for interior columns).
- Labels shall never be placed on the top or bottom of a container.

Master Label for Every Pallet:
- Supplier Name
- Prettl part number
- Part description
- Quantity per container
- Lot information
- Engineering/ Part Revision Level

Sub Pack Label:
- Prettl part number
- Engineering/ Part Revision Level
- Quantity per sub pack
- Lot information

Language and Condition:
-All data on the master label, the part no. and quantity of the sub pack label must be written in English.
-Mixed loads must be identified with one master label per individual part number.

-Master label printing size must be sufficient to enable reading of the Prettl part number from a distance of 2 m or 6 ft.

4.1 Sample Labels: 1st time delivery, CSI, CSII, PPAP

Certified Shipment	
Certified by (name):	Company:
Phone Number:	Date:
REFERENCE (QDR#, if available):	Qty in Container:
Features being Certified:	
Quality Manager Signature:	
F-QA-128, Rev 6, 09/24/2010 Label must be green and no smaller than 150 x 100 mm.	

IMPORTANT – SPECIAL HANDLING REQUIRED

NOTIFY THE QUALITY DEPARTMENT IMMEDIATELY UPON RECEIVING! DO NOT RELEASE THIS MATERIAL TO PRODUCTION AREAS WITHOUT QUALITY DEPARTMENT APPROVAL!

PRETTL Location:

Supplier Name:

Part Number:

Revision Level:

Qty Shipped:

Purchase Order Number:

☐ First Production Shipment

☐ Prototype

Attention:

☐ Non-Production Trial Samples

Attention:

☐ PPAP

Attention:

Documentation enclosed: Y☐ N☐

F-QA-0294, Rev 1, 09/24/2010
Label must be yellow and no smaller than 150x100mm

Appendix A

Description of Containment Requirements

Three types of containment exist for Prettl suppliers. These are early production containment, Level I containment, and Level II containment. Each type must be labeled using labels found in (4.0 Labeling Requirements).

Early Production Containment

Early Production Containment may be required for all new products shipped to Prettl for a minimum of 30 days after start of production. This requirement entails 100% offline inspection. Suppliers will be required to document any defects that are found and report them to Prettl. The 30 day time period shall restart after permanent corrective action is put in place each time a defect is found.
Failure to have successful Early Production Containment will lead to Level II containment.

Level I Containment CSI

Level I containment shall be instituted for repetitive issues, external or customer issues, and/or multiple defects in the supplier's product line. This requirement entails 100% offline inspection for a minimum of 30 days. Prettl will send details of Level I Containment requirements when Level I Containment is issued to the supplier. Suppliers will be required to document any defects that are found and report them to Prettl. The 30-day time period shall restart and corrective action investigated if further defects are found. Failure to have successful Level I containment will lead to Level II containment.

Level II Containment CSII

Level II Containment is enforced for failure of early production containment or Level I containment and when customer directed. This requirement entails 100% sorting by a 3rd party containment company at an off-site location unless prior approval is granted from Prettl. Prettl reserves the right to refuse the use of unapproved third party companies. Data obtained from the third party must be sent directly to Prettl. Prettl will send details of Level II Containment requirements when Level II Containment is issued to the supplier. Level II Containment shall be in place for a minimum of 30 days after permanent corrective action is implemented. The 30-day time period shall restart and corrective action re-investigated if further defects are found. Level II Containment that needs to be performed at our facility will be initiated with a limited scope and in order to ensure that our customer's process is protected. Prettl expects full authorization to a 3rd party Containment Company for any subsequent and continual sorting and a refund of the amounts Prettl incurs until then.

Appendix B

8-D Problem Solving

Introduction

This **8-D Problem Solving** standard has been developed to help you solve complex problems for which the cause is unknown. It is designed to help guide problem solving teams through the 8-D process by providing some structure and a detailed explanation of each step.

This standard will introduce each of the eight steps, identify the pieces of each step, provide some tools that are helpful in completing each step, and hopefully provide some helpful thoughts and experiences along the way. It is intended to be flexible so teams can understand the objective of each step and decide what process is most appropriate for their particular problem.

Scope

This standard introduces the topic **8 – Discipline Problem Solving** and gives a general guidance in the application of the technique. **8–D Problem Solving** can be described as a group of activities intended to systematically plan, track and document the activities critical to efficient, structured problem solving.

Field of Application

This document is a standard. The 8-D is applicable not only in product design and manufacturing processes, but also in business, marketing, HR, and other disciplines where choices and mistakes occur.

Responsibility

In general the party responsible for performing the 8-D is the owner of the process which produced the problem or reject. For a manufacturing quality or a delivery issue, this is usually the product team leader for the rejected or not-on-time product. This process owner is responsible for ensuring that the 8-D process is performed effectively and in a timely manner. He / she is also responsible for ensuring that the results are communicated appropriately.

General

Step 0: Become Aware of the Problem

We may become aware of a problem through notification from a customer of a reject or not-on-time shipment or through self-discovery. Problems which require an 8-D include:

- Nonconformities which could cause a serious incident
- Customer line rejects involving more than a single unit;
- A customer line reject which is a recurrence of an earlier problem;
- A field issue involving a high warranty rate;
- A field issue resulting in a retrofit
- Internal issues which are complex and require a team effort.

Appendix B (cont'd)

In the case of problems that we become aware of through customer notification, part of becoming aware of the problem involves responding to the customer within 24 hours of notification that we are aware of the problem and are looking into it.

Step 1: Assemble a Team

Form a small team (4 or 5 people) with the interest and necessary skills to effectively work through the 8-D Process. The 8-D team should bring in temporary members to perform specific tasks as needed. Consider the following roles when forming the 8-D team:

Champion: The champion is normally not a member of the 8-D team. This individual would be someone who has an interest in the team success, but has delegated the actual problem solution to a group of appropriately skilled and knowledgeable individuals. The role of the champion is to meet at regular intervals with the team leader, monitor progress of the team, garner resources the team does not have authority to use, and remove barriers that the team may encounter.

8-D team leader: The 8-D team leader is the owner of the problem solution and responsible for the process that leads to the solving of the problem. He/she is responsible for scheduling most of the meetings, documenting team assignments, tracking action items, leading team meetings and reporting team progress to the Champion. The 8-D team leader, the technical experts and 8-D team members are responsible for the technical aspects of the discussion.

8-D Team members: These individuals will be involved with the problem-solving process from start to finish. They are usually directly involved in the process where the problem was found and know best how the process actually works.

Technical resources: These individuals would be temporary members of the team. They would be consulted during specific discussions and/or investigations and leave the team when their topic of expertise is concluded.

Facilitator: If the 8-D team leader needs help in focusing on the 8-D process, a facilitator can participate in the team. The facilitator will guide the 8-D team in the understanding of the elements in each of the steps to complete an 8-D Problem Solving Process. The facilitator will focus on the completion of each of the 8-steps of the process, and very little on the technical investigation and analysis.

Develop ground rules

The team should develop a set of ground rules at the beginning of the process. These rules should reflect procedural and relationship considerations. The ground rules should be reviewed and modified if necessary, at the beginning of each meeting.

Step 2: Describe the Problem and the Expectation

A complete and accurate problem statement is arguably the most important element in determining the root cause. Most teams that have trouble finding a root cause don't have an adequate problem statement.

Appendix B (cont'd)

Specify the internal/external customer problem by identifying in quantifiable terms the (5W2H) for the problem:

- Who (Customer name)
- What (Part name & number and serial number)
- When (Date, hours of use)
- Where (In plant, in field, on machine)
- Why (Assumed failure of part)
- How (How did the failure appear)
- How many (Number of claimed parts)

Describe in quantifiable terms the customer expectation. A table that organizes the 5W2H for the problem may be helpful both for ensuring complete information and for communicating the issue effectively.
Part of step 2 is also to confirm the failure claimed by the customer.
Tools useful for this confirmation are:

- Failure Tree Analyses
- FMEA
- Control Plan

Step 3: Implement Containment Actions

Containment definition
The purpose of Step 3 is to isolate the customer from the effect of the problem. The containment has to be implemented within the present Prettl Automotive goal for timing from initial problem awareness to implementation. Keep in mind that, generally, the sooner the containment is implemented, the fewer the rejects experienced by the customer and the less expensive the recovery will be. Many teams will take action to reduce the likelihood of the effect. This is not truly containment. In some cases, it is very difficult to determine a 100% containment. In this case, it may be necessary to implement several risk reducing containments in series.

Stop the process if necessary
In some cases, it is necessary to stop the process in order to stop the flow of potential problems. Stopping has a containment effect. It stops the bleeding for a limited amount of time only.

- Stop the production process
- Stop orders in packaging and shipping
- Stop components in Factory Warehouse

Retrieve the defective product and/or output
Product that is suspected of being defective should be returned for analysis. This product can sometimes be used to gather data about the severity and frequency of the problem.
Specific, actionable information about the defect shall be requested from the customer:

- Detailed description of the problem (call the customer for further information)
- Pictures of suspected product can help
- Expedite return of suspected product
- Confirm problem by analysis of suspected product.

Retrieve / isolate any defective product
Products that are suspected of being defective should be returned for rework. These products can sometimes be used to gather data about the severity and frequency of the problem. Be sure to consider/check all suspect products including:

Appendix B (cont'd)

- Work in progress (WIP)
- Finished goods inventory in house
- Products in transit to the customer
- Products in customer inventory
- Products on the customer's production line.

Verify that the system is in control

Verify that the defined processes are being followed and if the defective component followed the production process.

- Did the defective component pass the production test
- Is MRP system according to specification
- Are work instructions and control plan present and followed
- Is operator sufficiently trained
- Is failure identified in FMEA
- Is failure detected according to control plan
- Is Gage R&R according to specification

Develop a list of possible containment actions

This is an expanding task. Many ideas should be generated and the team should consider bringing in temporary members. Brainstorming is a good tool to use for this task.
Following should be factored into the decision:

- Safety issue
- Frequency of occurrence (repeated failure, occur in groups or individual)
- Customer sensitivity to defects including other SD problems
- Risk of containment compared to problem (contamination)

Important containment steps are:

- Inform production personnel about the defect and get feedback on possible occurrence of defect and root cause
- Check all parts in the supply chain (production, internal stock, in transit, supplier stock, work in progress)
- Check at other products/customers if same or similar problem could arise
- Make decision about containment marking of parts and/or packaging and for how long time

Consensus on the best possible containment action

Consensus is reached when a team decides on a solution and all members of the team agree to support the decision. Not all team members have to agree that the solution is the best.
Containment examples are:

- 100% inspection (only 95% effective).
- Multiple inspections.
- Reduce acceptance limits
- Add additional process detections
- Limiting who can perform the action

Test the containment

The containment must eliminate the effect of the problem from the customer. The containment can be verified by analytical or experimental methods. Test that the containment is effective by introducing a defect component.

Appendix B (cont'd)

Implement the containment

Once containment has been decided upon, it is time to implement it. This process needs to happen quickly. Maintain the decided actions until a permanent corrective action is in place.

Document the containment
One of the most overlooked parts of containment is the proper documentation of what was done. The reason is that it seems so obvious at the time the containment was done. The 5W's and 2H's are a good way to ensure that enough documentation has been done. Examples of documentation are written instructions, deviations, and engineering changes. Whatever the documentation is, it must be thorough and easily retrieved and can be understood at a later time when the details of the containment have been long forgotten.

Measure the Effectiveness
Develop a method of measuring the effectiveness of the containment. Some problems require weeks or months to determine the root cause and implement corrective actions. During that time, our customers will expect 100% effectiveness of the containment. We need to measure this to understand how well we have met our customer's expectation.

Step 4: Define and Verify Root Cause(s)

Identify all potential causes that could theoretically explain why the problem occurred. Isolate and verify the root cause by mental and/or physical test of potential causes against the problem description and data.

Review the problem statement
It is a good idea to review the problem statement often, but it is necessary to do it at the beginning of Step 4. Update the problem definition with any new facts that have been gathered since Step 2.

Identify failure by analyzing the defective product(s)
If defective product(s) are available, analysis is made to identify the exact problem.
If needed, test the defective product(s) on production equipment, on laboratory test stand or on the machine itself to experience if performance, function values and dimensions are according to specifications.

Use appropriate tools to brainstorm potential root causes and select the real root cause
In order to find the true root cause, it is important to use the appropriate tools. Tools which should be considered during this step are:

- Is / Is Not table
- Fishbone / Cause and Effect / Ishikawa diagram
- 5 Whys

Step 5: Define and Verify Permanent Corrective Actions

It is tempting to look at this step as re-stating the obvious because the solution often seems obvious once the root cause is defined. But it is important for the team to find the best possible solution, and that is not always so obvious.

Develop a list of possible corrective actions
The team should develop a long list of possible corrective actions. Brainstorming is a good technique for this task. Don't be afraid to bring in other people, especially the people who will be affected by the solution. There will be much greater ownership if they are part of the solution.

Appendix B (cont'd)

Verify that the corrective action is effective and that there are no adverse side effects
This is an action that is taken "off line" before the implementation. The permanent corrective action must eliminate the root cause as well as the effect. The best way to prove the effectiveness is to be able to turn the defect on and off .At the same time, the team must verify that the proposed solution does not cause any other problems.

Timing target for corrective actions

The target timing for planning / implementing permanent corrective actions is 2 weeks from problem awareness. Prior to the corrective action being implemented, the customer is only protected by containment. If the permanent corrective action will take several weeks or months to implement, the team should look for some interim corrective action to relieve the pressure on those performing the containment.

Step 6: Implement Permanent Corrective Actions

Define and implement the best permanent corrective actions (PCA's). Choose controls to ensure the root cause is eliminated. Once in production, monitor the process and results.

Develop an implementation plan
The plan needs to include the detailed steps that need to be completed to implement the chosen solution. Special attention should be given to areas which are high risk. The team should try to anticipate where problems are going to occur and make an attempt to prevent them.

Review the process, design, or system FMEA and control plan
The team should review the appropriate FMEAs and control plans and determine what, if any, changes need to be made to those documents. Teams or individuals affected by the FMEAs and control plans may need to be part of the review process.

Execute the plan
Follow the team's plan to implement the permanent corrective action. Complete PPAP when appropriate.

Monitor the results
Put appropriate controls in place to ensure that the corrective action is functioning as planned. Determine the method and the frequency of these checks.

Appendix B (cont'd)

Remove the containment
The containment that was implemented in Step 3 likely included some inspection or mistake proof process. There is often a large amount of data generated as a result of the containment. If this is the case, the effectiveness of the corrective action should be noticeable. If so, remove the containment.

Step 7: Prevent Recurrence

Everything the team has done so far has been reactive. This step requires that proactive work be done to share what the team has learned so that this problem and similar problems can be avoided in the future. ***This step is absolutely critical in preventing repeat problems and improving quality.***

Identify the system that allowed the problem to occur
Problems are connected to or influenced by the process or system that contains them, whether that process is manufacturing, administrative, or otherwise. This is an opportunity for the team to "close other doors" or a similar problem might walk through.

Think beyond this problem
Think about where this problem might show up
Think about other people who might benefit from what you have learned
Use communication technology (voicemail and e-mail)
Go global.

Change the system or systems that allowed this problem to occur
This task may or may not be beyond the scope of the team. Remember, it is the role of the Champion to expand the sphere of influence of the team. The team should identify what changes are necessary to prevent this problem from ever occurring again anywhere at Prettl Automotive or their suppliers, take that knowledge to the Champion, and with his/her help, plan the spread of the new knowledge and actions to leverage that knowledge. Management's monthly Quality Problems meeting would be an excellent opportunity to implement this step. Also, consider as a minimum updating the control plans and process FMEAs for similar processes.

Step 8: Celebrate the Success with the team

Unfortunately, this is a commonly overlooked step, partly because many teams never get this far in the process and partly because many people don't think it is important. But it is **very** important to celebrate and recognize success. The 8-D team leader, in consultation with the Champion, is responsible for ensuring that this activity occurs. The managers' monthly Quality Problems meeting is an opportunity to create a culture of success recognition, and do so for each of the Problem Solving teams.

Appendix C

Contact Information, Invoice Addresses and specific country instructions:

Prettl Electric Corp.

Invoice address is:	**Contacts:**
Prettl Electric Corp. Attn.: Accounts Payable 1721 White Horse Rd Greenville, SC 29605 USA Tax ID #: 57-0879681	e-mail accounting: ap@prettl.com e-mail logistics: usgv.logistics@prettl.com e-mail purchasing : usgv.purchasing@prettl.com

Prettl Electric del Bajio, S.A. de C.V.

All component suppliers to Prettl Electric Bajio invoice with VAT 0%.

Invoice address is:	**Contacts:**
Prettl Electric Corp. Attn.: Accounts Payable 1721 White Horse Rd Greenville, SC 29605 USA Tax ID #: 57-0879681 **Consignee Address is:** Prettl Electric del Bajio S.A. de C.V. Libr. Empalme Escobedo-Comonfort No. 50 Comonfort, Gto. 38210, Mexico Tax ID #: PEB060831943	e-mail accounting: ap@prettl.com e-mail logistics: mxcf.logisticspeb@prettl.com e-mail purchasing : usgv.purchasing@prettl.com

Appendix C (cont'd)

Prettl Components Michigan LLC. (Delivery in USA)

Invoice address is:	**Contacts:**
Prettl Components Michigan LLC. Attn.: Accounts Payable 1721 White Horse Rd Greenville, SC 29605 USA Tax ID #: 38-3614153	e-mail accounting: ap@prettl.com e-mail logistics: usgv.logistics@prettl.com e-mail purchasing : usgv.purchasing@prettl.com

Prettl Components Michigan LLC. (Delivery in Mexico)

All component suppliers to Prettl Electric Bajio invoice with VAT 0%.

Invoice address is:	**Contacts:**
Prettl Components Michigan LLC. Attn.: Accounts Payable 1721 White Horse Rd Greenville, SC 29605 USA Tax ID #: 38-3614153 **Consignee Address is:** Prettl Electric del Bajio S.A. de C.V. Libr. Empalme Escobedo-Comonfort No. 50 Comonfort, Gto. 38210, Mexico Tax ID #: PEB060831943	e-mail accounting: ap@prettl.com e-mail logistics: mxcf.logisticspeb@prettl.com e-mail purchasing : usgv.purchasing@prettl.com

Specifically for **Prettl Electric del Bajio and Prettl Components Michigan LLC. (Delivery in Mexico)** with local suppliers, the current rules of the virtual operation of pediment must be applied to and agree with purchasing negotiations.

One copy of invoice must be e-mailed to Prettl Logistics.

For Prettl Electric Corp, Prettl Components Michigan LLC. and Prettl Electric del Bajio:

Suppliers must email copy of the invoice to ap@prettl.com. Please, do not mail invoices.
Note: All suppliers in Mexico MUST send invoices via email with NO mailed copies.