optimize the manufacturing process by detecting any problems that might lead to a bad quality product early in the process. You need to prepare a business understanding document, and provide the customer with the data requirements that you think are needed to help ensure good quality diapers. You will submit a document describing your business understanding and data needs. You can use graphs, diagrams, and tables to explain your findings and request.

With the popularity of disposable in the market place a diaper manufacturing has taken off in the last thirty to forty years.  On the consumer end, any parent can attest to the importance of diaper quality and fit.  I can attest to there is nothing worse than a diaper failure in public or on the go.  Additionally, a child’s comfort is key.  To many fluids not absorbed by the diaper can lead to discomfort, rashes and other irritations. Major Diaper companies have too keep up with the consumer demand and ensure quality.  The population is growing exponentially, and every new child born will be in disposable diapers at some point.  Diaper Manufacturers need to optimize methods for absorption, comfort and construction.

One of the most critical components to the diaper is the absorbent pad.  This pad is what absorbs and stores the bodily waste in the disposable diaper. This pad consists of water loving molecules know in the industry as polymers and fibrous material derived from wood pulp.  The manufacturing for the absorbent pad typically involves creating layers.  There is a mixture of polymer and fibrous material sandwiched between fibrous layers to ensure that the liquids absorbed stay towards the center of the absorbent pad.  There is an optimal fiber to polymer ratio range for cost and absorbency.  Additionally, polymer mass plays a role in the absorbency. The standard test used to measure absorbency is the named the Absorbance Under Load (AUL) test.

With regards to the mixture of polymers and fibrous materials.  How are the polymer and fibrous ratios determined and measured? Are there different ratios used within the range or is one selected?  Is there variance in the ratios between batches?  What is the variance in the amount of polymer and fibrous mixture injected into the absorbance pad.  Are different ratios or amounts of the polymer and fibrous mixture used for different size diapers?

With regards to the polymer mass particle size.  How are the current polymers manufactured and what data is used to manufacture them?  How is the polymer size measured?  What is the polymer mass size variance?  What data is used to create these polymers, and can we use values for the mass size prediction?

With regards to the Absorbance Under Load Test.  Are different pressures applied to different sized diapers to account for difference baby weights?  What is the variance in absorbency results between all applied Absorbance Under Load tests? Can we use the polymer and fibrous mixture ratio to predict the Absorbance Under Load test results?  In addition to the polymer and fiber mixture ratio, can we use the polymer mass size to predict the Absorbance Under Load test results?

The absorbent pad is wedged between layers of nonwoven fabrics made from plastic resins, which is typically polypropylene.  The nonwoven materials for the diapers are cut from sheets usually manufactured at a different location from where the diapers are assembled. The top and bottom sheets are cut from these sheets.  Finally, they are assembled with the absorbent pad and elastic bands.

With regards to the nonwoven fabrics.  What is the melting point for the nonwoven materials?  What is the variance between melting points of similar materials.  When the top and bottom sheets are cut, what are the variances in sizes including length, width, and thickness?  Can we use the melting point data to predict if particular nonwoven fabrics will stick to the diaper assembly apparatus? Can we use the sheet length, width and thickness to predict alignment of the fabrics on the diaper?  Furthermore, the elastic band plays a role in holding the diaper in place on the waist of the baby. With regards to the elastic band what is the length and variance of the materials used.  How is elasticity measured?

Looking at the different variables in making in the absorbent pad and woven fabrics we may be able to predict and improve quality results.  For absorbent pads we can possibly use the polymer mass size and polymer and fibrous ratio to predict Absorbance Under Load.  For nonwoven we can use melting point to predict if fabrics will stick to the assembly.  Hopefully this will reduce waste and provide insight to further optimize diaper manufacturing.