A Case for Self Compounding

Introduction

It is becoming increasingly essential that Cable Companies focus on becoming cost efficient producers of cables as the environment becomes increasing competitive. Self compounding, now more than ever, becomes a viable option in reducing the Cable Companies overall cost.

The fundamental reason for Self Compounding is cost savings.

In order for Self compounding to become a viable option for Cable Companies, Plexchem realized that the self compounding equipment had to be efficient and productive essentially idiot proof (so that Cable Companies could deploy existing employees to manufacture XLPE compounds when required), inexpensive in cost and yet be able to manufacture varied sizes of quality compounds economically. The Cable Companies were interested in producing compounds to meet their requirements and were not in the business of selling compounds to others. So the compounding process had to be able to produce small batch lots on demand, without losing its cost effectiveness and at the same time, generating very little or no waste products.

Providing the Cable Companies with a fully integrated system is another important prerequisite to self compounding. Unlike other technology providers, whose efforts are in reality restricted in their scope and ability, Plexchem, and its licensees, are still major XLPE compounders to the Global cable industry ie supplying actual compounds that is used by cable companies to make cables for sale. Many Cable Companies are already familiar with the compounds manufactured by one of our many licensees around the world. Thus, Plexchem will be able, on the first production run, to deliver products that are equivalent to those that are still in use in cable companies, eliminating the need for costly and time consuming trial and error process.

Self compounding has the added benefit of improving the technological competence of the Cable Company. This acquired confidence would allow it to embark on product improvement and development projects, underlining their superiority over their competitors.

Achievable Savings

Cost savings results from

a. Infusion compounding process:
   Adsorption process, minimizes energy requirements results is real cost savings
b. Elimination of costly packaging:
   Manufacturing of compound prior to cable extrusion, diminishes the need for long storage time thus allowing for the use of recycled packaging and the elimination of costly Aluminium Bags
c. Reduced handling and shipment charges:
   On site production eliminates costly shipping and handling charges
d. Manufacturing overheads:
   Because of the “idiot proof” manufacturing system and brisk production rates (1 mt/hr), compounds are usually made using cable company employees during cable production’s down time, thus significantly reduces manufacturing overheads
e. Rental:
   The compactness of the production equipment, reduces the production space, thus allowing the production to be performed at the cable company’s premises
f. Profits:
   Self compounding results in the elimination of profits for the compounder

Results in significant savings for Self compounders

Equally Important Benefits to Self Compounding

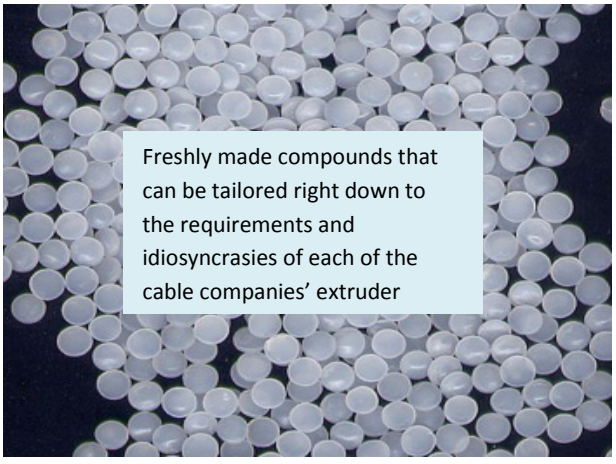
Besides substantial savings, there are other equally compelling reasons for Self-compounding. Every Cable Company desires to be in control of their activities from producing quality products today to manufacturing intricate products in the future. Summarizing, besides savings, the benefits for self compounding are:

a. Product Quality
b. Enhancing Company's Profile
c. Interaction with Suppliers

Product Quality

a. Fresh product when required:
Starting with original components, compounds can be manufactured 2-3 days prior to use. This differs from commercial compounds which had been manufactured usually weeks, if not months in advance.

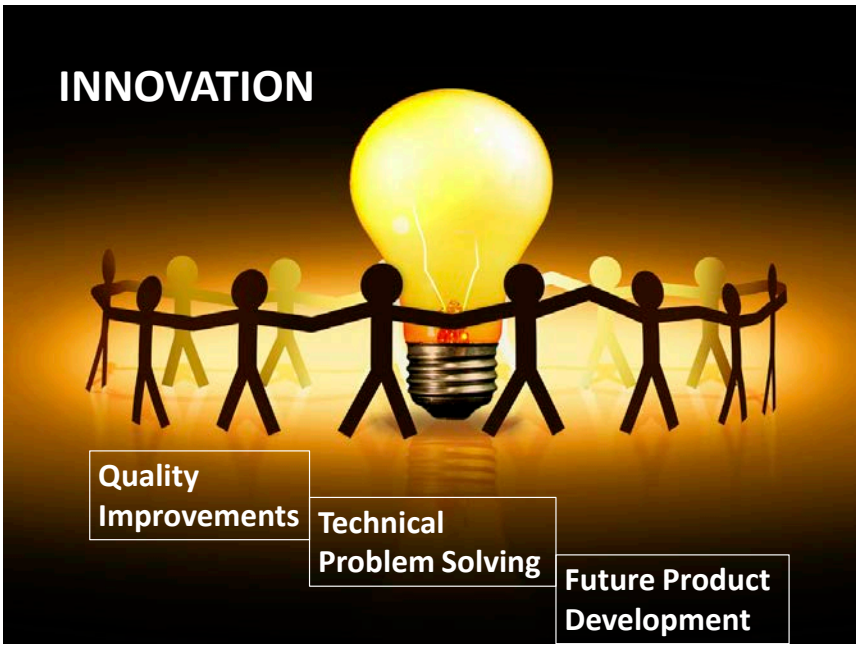
b. Consistent Product Quality:
Simple compounding process, with only a few processing variables, will lead to the manufacture of analogous compounds that will consistently meet a Cable Company's equipment requirements and its desired cable properties.



c. Tailor made Products to Suit Equipment Idiosyncrasies:
Commercial compounds are made to be used in many different types of extruders that are used in many different Cable Companies. A product which works extremely well in one extruder may not be suitable for use in another. Self compounding allows a Cable Company to adapt XLPE compounds that are tailored specifically to the demands of their equipment.

d. Products to meet Enhanced Technical Specification: Commercial compounds are made for general specifications. However, self compounded products can be tailored to meet even higher stringent conditions and specifications.

Enhancing Company's Profile



a. Quality Improvements:
The ability of the Cable Company to offer products to the market that have superior or made to order specifications. This is not possible using standard compounds made by commercial compound suppliers.

b. Technical Problem Solving:
The ability for a Cable Company to advise their customers on insulation related problems will be enhanced, even without having to defer to compound suppliers. With a total understanding of the know-how used in every aspect of the cable production process, Cable Companies can be in a position to identify and rectify potential problem areas sometimes even before such problems arises.

c. Future Product Development:
Cable Companies have the cable processing capabilities which would be invaluable for trial runs in the development of future products and specifications. Cable Companies with Self Compounding facilities would be in the best position to test new concepts and technologies. XLPE compounds, made using silane technology conceived by Dow Corning, was first developed by Kabel Metal, a German cable company.

Interacting with Suppliers

a. Negotiation with Suppliers:
The ability for a Cable Company to Self Compound is enough to compel commercial compounders to agree to some very favorable compounds prices. The prices of compounds sold by commercial compounders track polymer prices such that compound prices are higher if polymer prices are up. In markets where basic polymer prices are climbing rapidly, some astute Self Compounders cut back on their basic polymer purchases and increase purchases from commercial compounders, at very favorable prices. They do this so as not to get caught with high polymer inventory cost when the market suddenly reverses itself. During the down turn, where there is a disparity between the market prices for polymer and the official offered prices, Self Compounding becomes the preferred route for obtaining lower cost compounds.

b. Overcome Stock Out & Product Allocations:
During periods of peak demand, commercial compounders may be faced with stock out situations and may have to place their customers on allocation. A Self Compounder will have multiple supply options and may have less supply constraints to contend with.

c. Technical Collaboration:
Producers of polymers, stabilizers, flame retardants and processing aids would be pleased to undertake joint collaboration with self compounders who are themselves authentic end uses. These Chemicals producers would be able to have their products tested in a company that is both a compounder and a cable producer. The Cable Company would benefit by enhancing its technological edge and knowledge competence and as an added bonus, obtaining favorable pricing from these participating suppliers.

Choosing your Right Technological Partner

There are many technology suppliers that are able to offer various Self Compounding Technology. Appended below is a checklist for a Cable Company to consider when choosing a technological provider for a self-compounding technology:

CHECKLIST ITEM	TAG LINE
Track Record	Been There! Done That!
Technology	You will never walk alone
Supplementary Products	Ready for the Next Leap!

Track Record

a. Problem Solving Experience:
   - Number of Licensees Worldwide
   - Number of years in Service
   - Volume of Compound Sold World wide

   Not only is this a vote of confidence for the Technology Provider but the shared experiences of so many licensees, volume of compound produced and sold over the years will ensure that the Technology Provider would have constantly made major improvements to his compounding process and be ready to offer ready solutions, almost immediately, even for the most complex technical problems.

b. Repeat Buyers:
   Repeat buyers for both the Self Compounding Technology and the manufactured XLPE compound are an indication of the effectiveness, in terms of cost and quality, of the technology on offer.

c. Ability to Provide Immediate Response to Technical Quires:
   Replies on technical matters should be provided within three working days. Technology Providers that depend on multiple divisions for answers are usually slow to respond. It is frustrating to have to require multiple reminders for answers which on arrival are sometimes incomplete or out of point. Poor or incomplete replies may result in shut down or work stoppages and in the worst instance loss of confidence.

Technology

a. Total Solution Package:
   The most proficient Technology Provider will be the one that can offer the Cable Company a <u>total solution package</u>. The ability of the Technology Provider to do this is the direct consequence of the Provider's know-how, knowledge, innovativeness and experience. It is indisputable therefore, that an existing Compound Supplier, with many years experience in

manufacturing and supplying significant quantities of compound to many different Cable Companies all over the world, would be such a candidate. Such a Technology Provider would be able to:

- *Provide Actual Workable Formulations without the need for any Trial & Error Testing*
- *Custom build Equipment to meet Cable Companies Specification*
- *Pre testing of alternative sources of Polymers (including indigenous polymers)*
- *Provide Training to production operators, QC specialist & laboratory technicians*
- *Drafting of ISO Manuals & implementing ISO Systems*
- *Drafting & publishing of Technical Data / Specification Sheets*
- *Disseminating the latest Technical Information*
- *Supply Compound and Polymer Pricing Updates*
- *Recommendation for Equipment & Accessories for Production & Testing*

b. Continued Product Improvements:
There is always a continued requirement to develop a better product with even more stringent properties. This could be product driven by end users or could be technologically driven by improvements in additives and polymers technology. In any case the Technology Provider must have the ability to keep abreast with the latest technical improvements and product requirements and, at the same time, have the ability to adapt these changes into their production process in order to enhance the performance of the product that is manufactured by them.

c. Continued Process Improvements:
The compounding process must evolve to meet the increased demands for product improvements, better processing economics and enhanced quality control systems.

d. Ongoing Technical Support:
Cable Companies are skilled in cable production but are often deficient in chemical proficiency and therefore will require ongoing technical support in formulating new products with enhanced requirements, dealing with problems that may arise in the long term life of the cable and processibility of the finished compounds in their existing or future extruders.

e. Assistance in Implementing Good Practices Principals:
The invaluable experience gained in dealing with so many different customers, each with their unique sets of equipment, offers the Technology Provider a unique inside into the excellent practices from outstanding Cable Companies that can be adopted by other Licensees.

Supplementary Products

a. Continuing R & D Programs:
Improvements in product quality through product development and innovative products from research programs requires the continuous interaction between the Self Compounding Cable Company and the Technology Provider. It is important that the Technology Provider is equipped to undertake the development of these products and have the track record of successfully introducing newly developed products to the market place.

b. New Innovative Products:
The ability of the Technology Provider to provide new and innovative compounds will increase the product portfolio of the Cable Company and enhance its status as an Innovative supplier of Cable products.

c. Seamless Integration with Supplementary Products:
The Technology Provider must not be a one product company but have the ability to offer expertise to produce other Supplementary Products that is used in cable production. This will allow the Self Compounding Cable Company to plan for the expansion into the production of other products at the appropriate time without having the need to outsource for know-how.

Compounding Technology Checklist

We have put together a check list of what are some of the points to consider when deciding on a Self Compounding Technology Provider:

a. Manufactures Quality Products:
Product which meets the International standard and the Company's adopted standard for QC.

b. Uncomplicated:
The ability to use existing production operators will lower the cost of compounding and therefore requires that the process be simple and be run by operators with little or no knowledge or experience in operating compounding equipment.

c. Inexpensive:
Compounding equipment should be considered an auxiliary to the cable extruder and not a standalone piece. As an extension to the cable making process the compounding equipment should be made inexpensive.

d. Adequate production Lot Sizes:
There should be no economic penalty to produce small lot sizes to meet the immediate demand of the Cable Company.

e. Minimum down time:
The compounding process should not be stalled by a long and tedious starting and stopping process especially as most production lot sizes are small and infrequent.

f. Minimum waste:
There should be little or no waste generated during the starting and stopping process and during the transition when the polymer and additives are converted into the crosslinkable compound. In the traditional method used in compounding of small lots sizes, the material loss could exceed 30%.

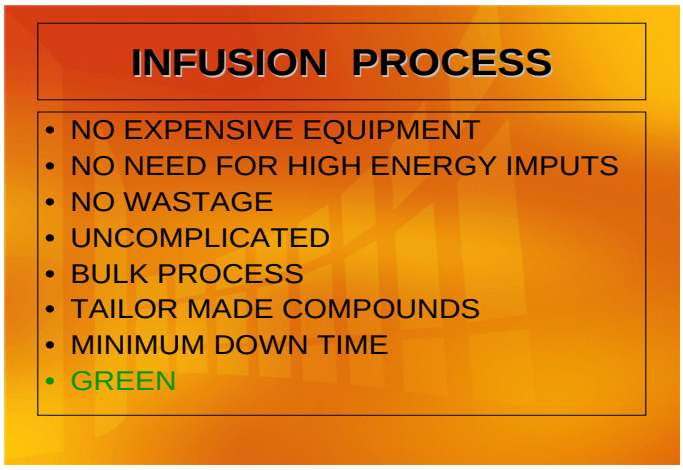
g. Product flexibility:
The process must allow for almost instantaneous changes in formulation and the negligible production of wasteful transitional compounds.

h. Minimum space & resource requirements:
As the system is considered an auxiliary piece of equipment to the cable extrusion process, the equipment should occupy a small space and requiring little on no factory renovation.

i. Protected against Technological Theft:
Simplicity has its disadvantages and the greatest drawback is that the technology will be copied by the Cable Company's competitors. The process should have a built in mechanism to avoid the process from being copied.

j. Green:
The process should not consume a lot of production inputs such as water and electricity and should generate as little waste as possible. The best system would be one where all the products generated can be consumed.

Infusion is the Technology of Choice because:



- NO EXPENSIVE EQUIPMENT. Equipment to produce 400mt/mth is only USD130-150K
- NO NEED FOR HIGH ENERGY IMPUTS. Electricity to produce 1 mt is about USD3, no water usage etc.
- NO WASTAGE. All raw material used for the production ends up as compound. wastages are as low as 4kg of waste per 1/mt of compound produced or less than 0.5 %
- UNCOMPLICATED. Just empty the bags and the CPU in the equipment will do the rest. if there is a mistake in the weighing of the raw material the equipment will not operate.
- BULK PROCESS. Bulk process allows you to make as much as or as little as you want. the minimum quantity of the lot size can be as little as 75kgs
- TAILOR MADE COMPOUNDS. Making specific formulations to be run in specific extruders is as simple as changing the amount of ingredients to be added in each mix.
- MINIMUM DOWN TIME. There is no pulling off screw to clean or preheating of equipment etc.

- GREEN. There is minimum waste because your input will almost equal your output, low energy consumption, small lot sizes, fresh material as you don't need to have large batches made and no need for continuous running.

Plexchem Technologies as Your Partner

Plexchem Technologies is an award winning compounding company who, together with its licensees, has been producing compounds since 1981 and have, sold over 300,000 mts and counting, of Silane Cable insulation Compounds (XLPE) worldwide. Compounds & Technology that can be supplied by Plexchem Technologies include:

a. Insulation XLPE compounds (peroxide or silane)
b. HFFR (halogen free, flame retardant) crosslinkable or thermoplastic Compounds
c. PE Black Jacketing
d. Natural/Coloured UV stabilized Crosslinkable insulation
e. Conductor screen: Crosslinkable (peroxide/silane) or Thermoplastic
f. Insulation screen: Crosslinkable (peroxide/silane) or Thermoplastic
g. EPDM silane crosslinkable compounds
h. Special hydrophobic Carbon Black for Silane XLPE
i. The world's first GREEN Anti Termite compound for PVC & PE Jacketing
j. Green Anti Rodent compounds for PVC & PE Jacketing
k. Calcium Carbonate Low LOI HFFR Jacketing Compound