'SME Expectations from Higher Education and the Realities'

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Chief Executive
Corrosioneering Group

Since 1974 The Corrosioneering Group,

(formerly Consultant Development Engineering), has developed a business from a 2 man start up, to a World Wide operation, working in diverse fields including;

- The Re-engineering of Capital Plant and Equipment,
- Pipeline Refurbishment
- Paint / Coatings Development and Manufacture
- Design and Manufacture of:

  Industrial Vacuum Cleaning and Conveying Equipment, Blast Cleaning and Painting Machines and Industrial Lighting.
- The Manufacture of Glass Flake fillers for industry.

The Corrosioneering Group works with customers involved in;

- Electrical power generation, Offshore and onshore oil production, Oil refining, Pulp & Paper production, Sugar refining etc.
- Gas and Oil Transmission.

- The Marine Industry.
- Mining and minerals.
- Industrial vacuum cleaning and conveying equipment.

- The paint and anti-corrosion industry.
- The manufacture of pigments including nano particles.
- Manufacture of thermoplastic and thermoset polymers.
- Etc.,etc.

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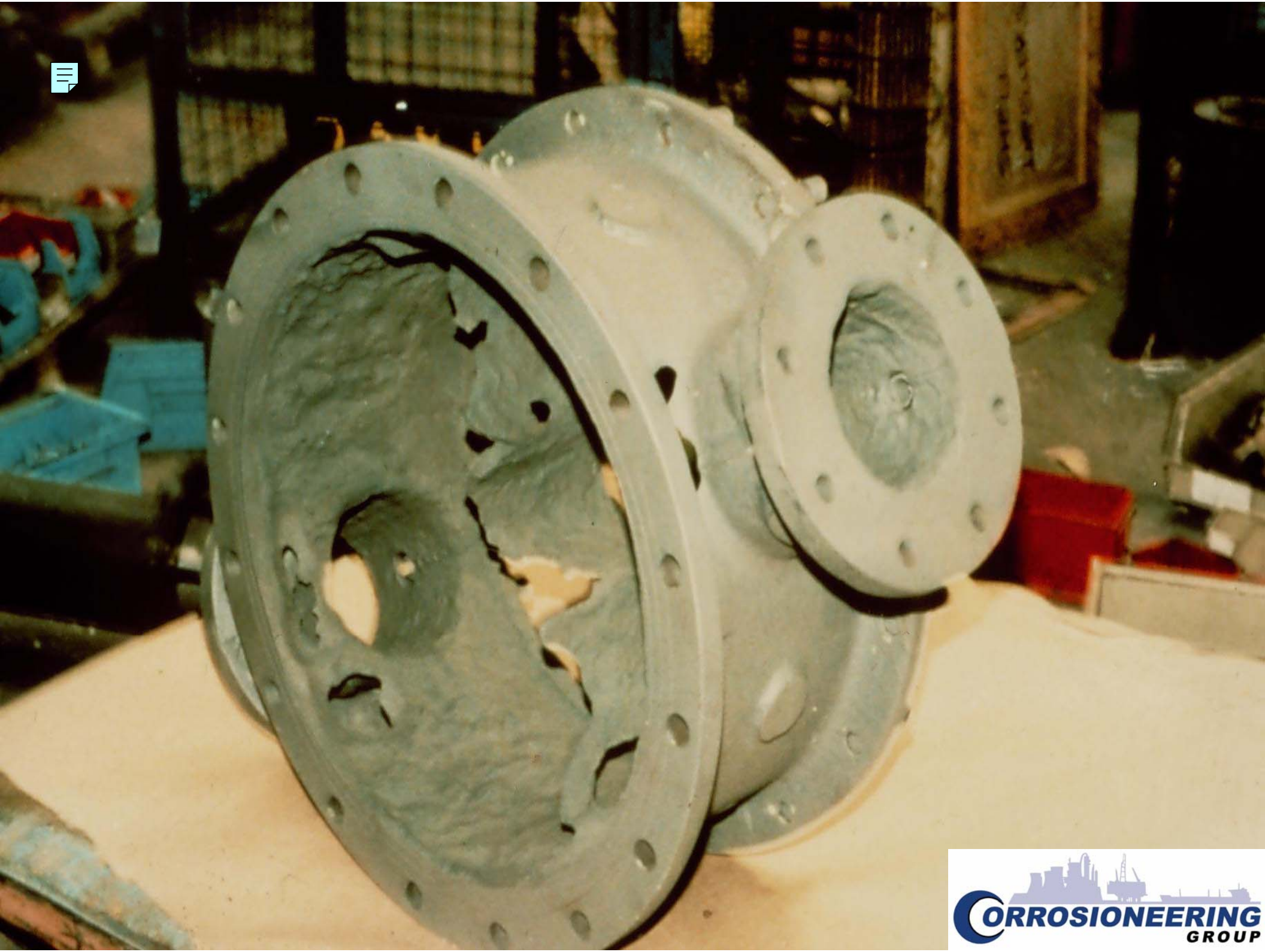
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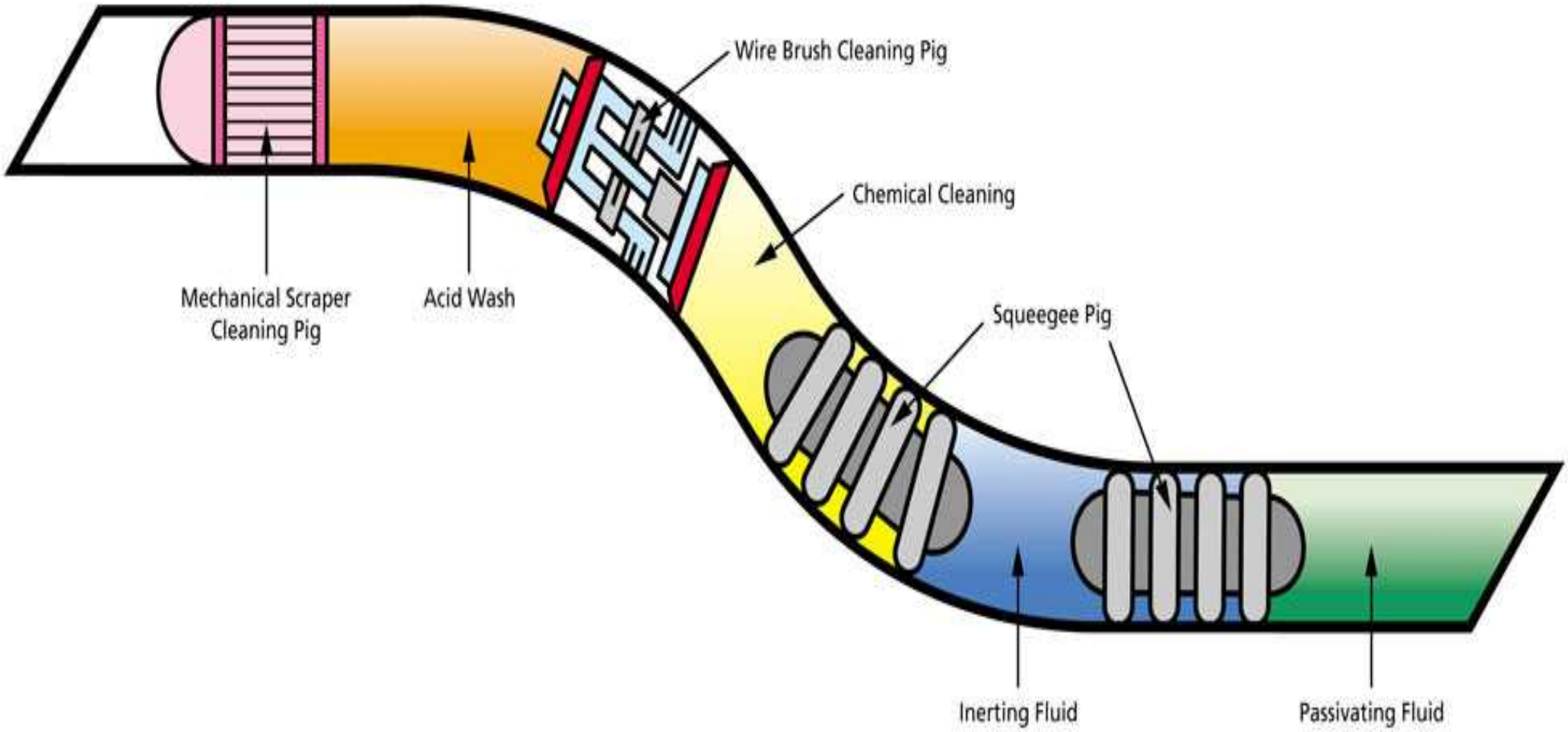
Pipe Pigging Technology



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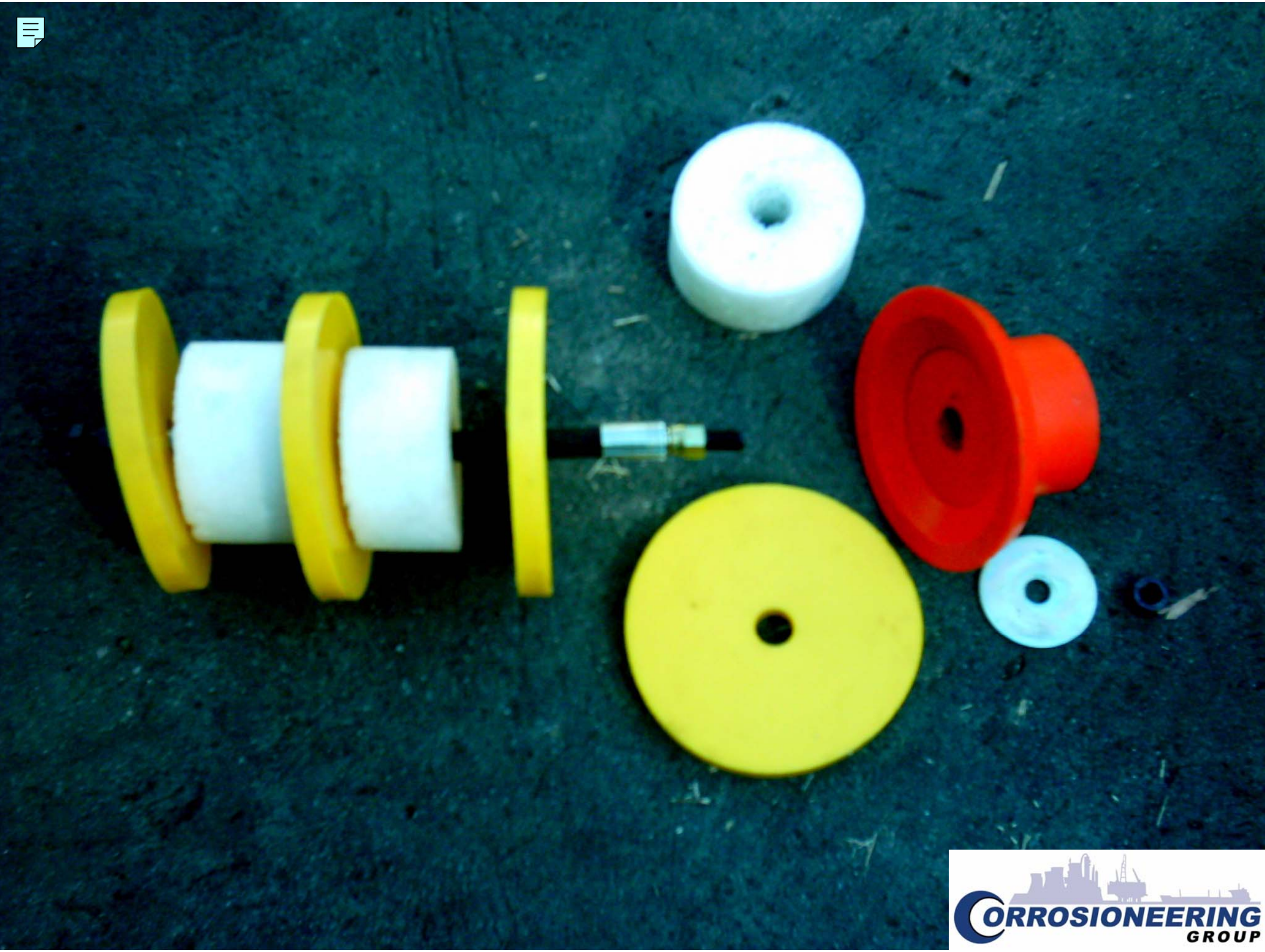
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2022.
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Pipe Spool Showing Filled Pits After 1 Run

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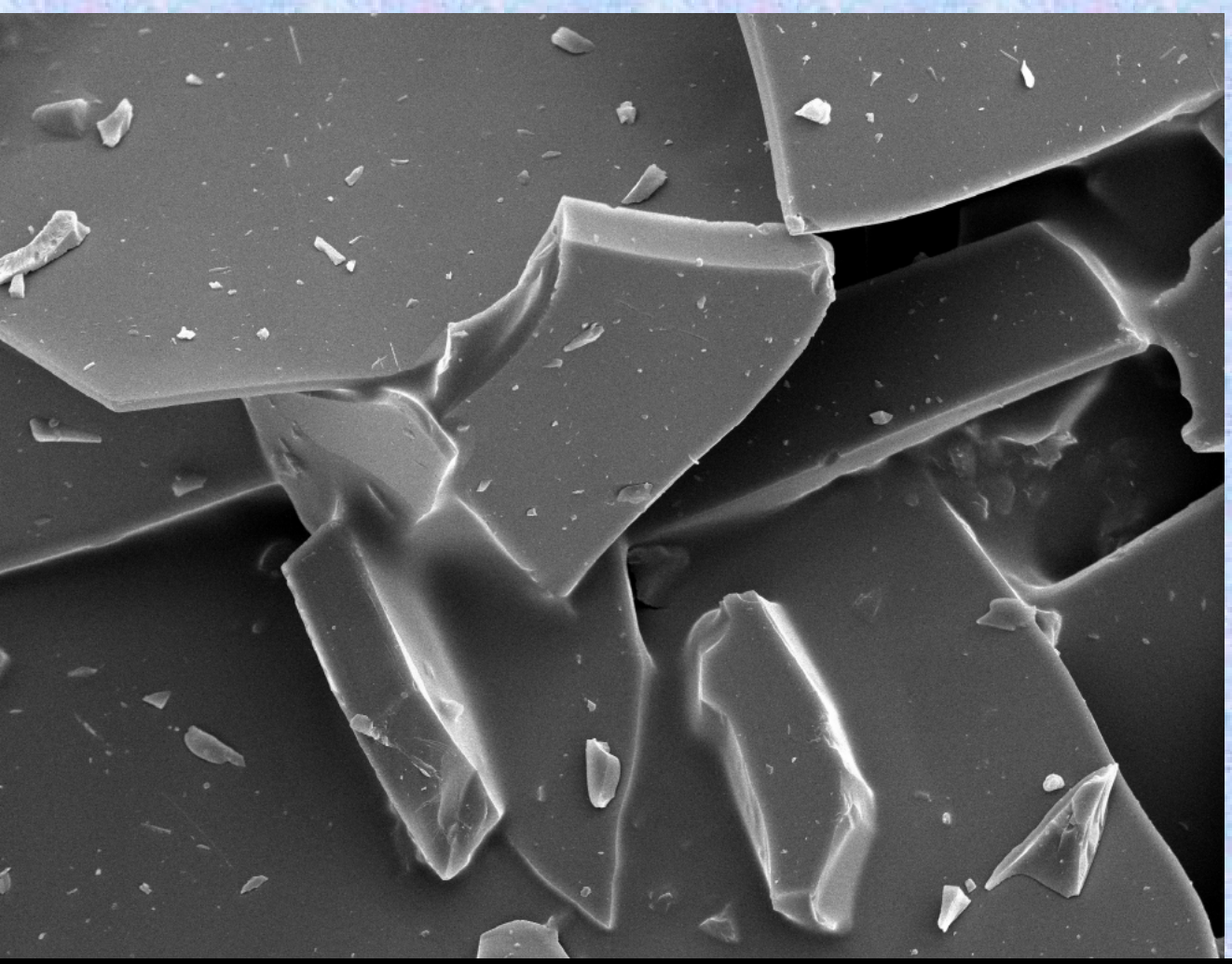
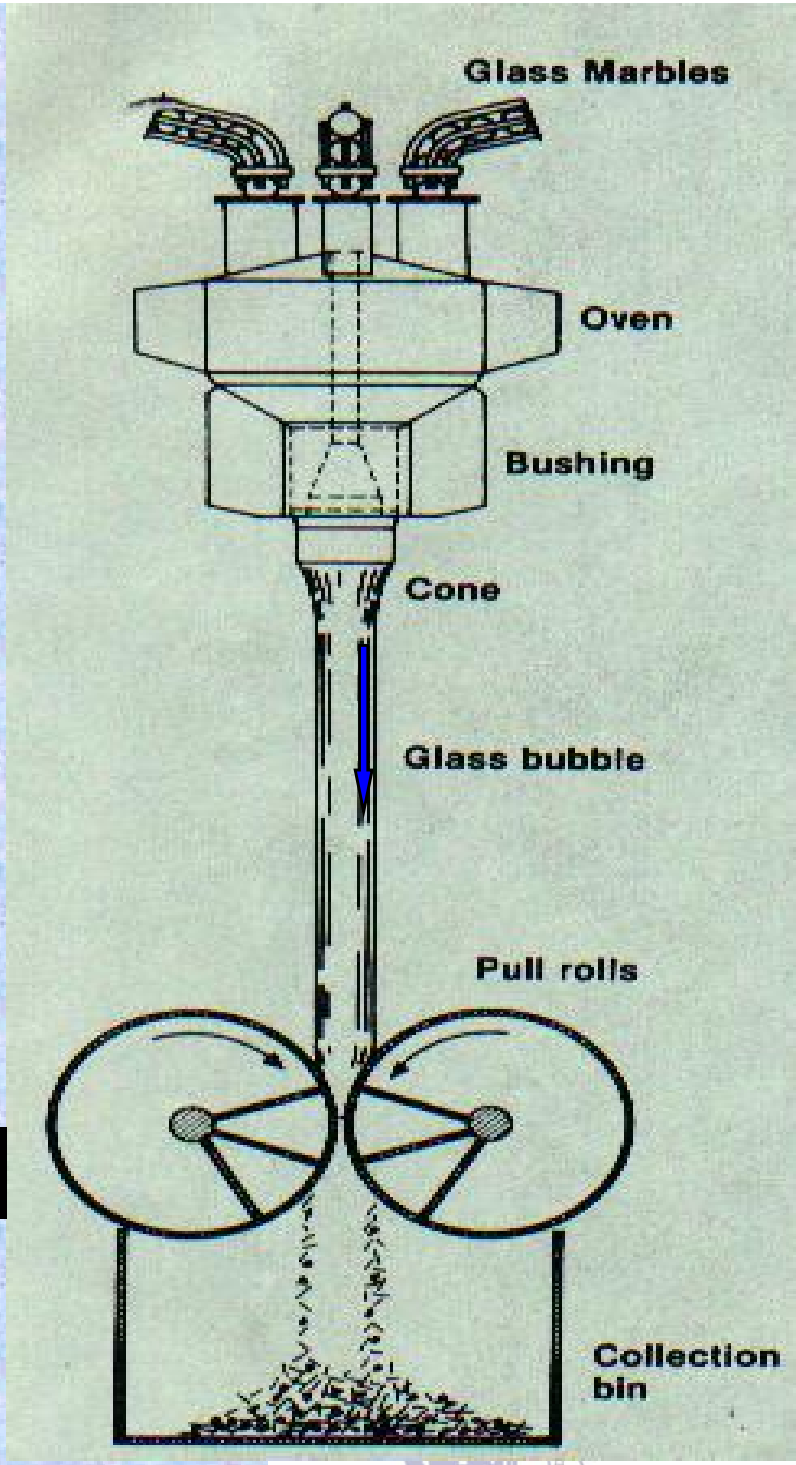
2nd run - 0.8mm, 7hr Pot Life, Vinyl Ester Glassflake Coating - Applied using specially developed Pigging Techniques



Original Glass Flake Manufacturing Process



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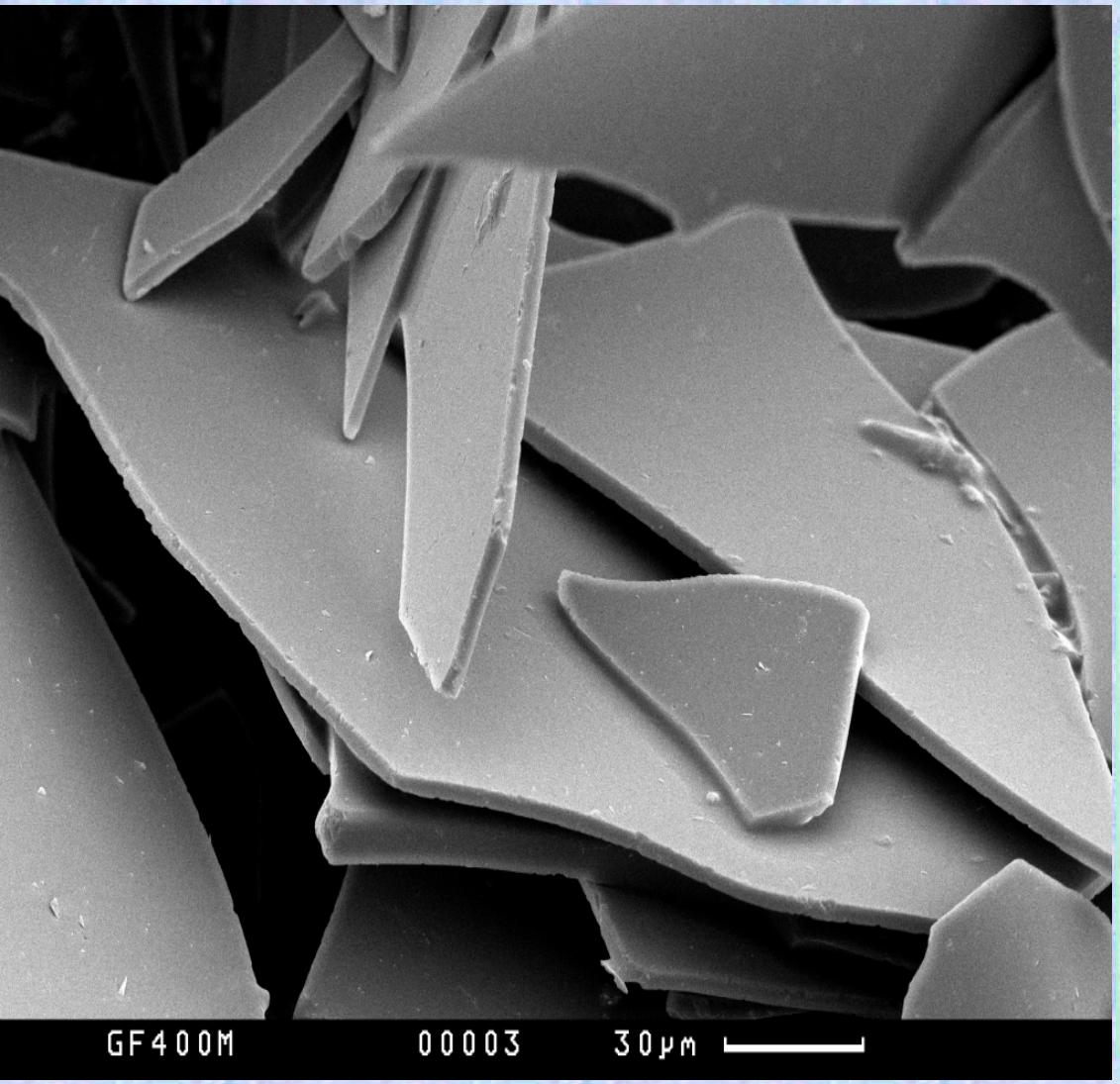

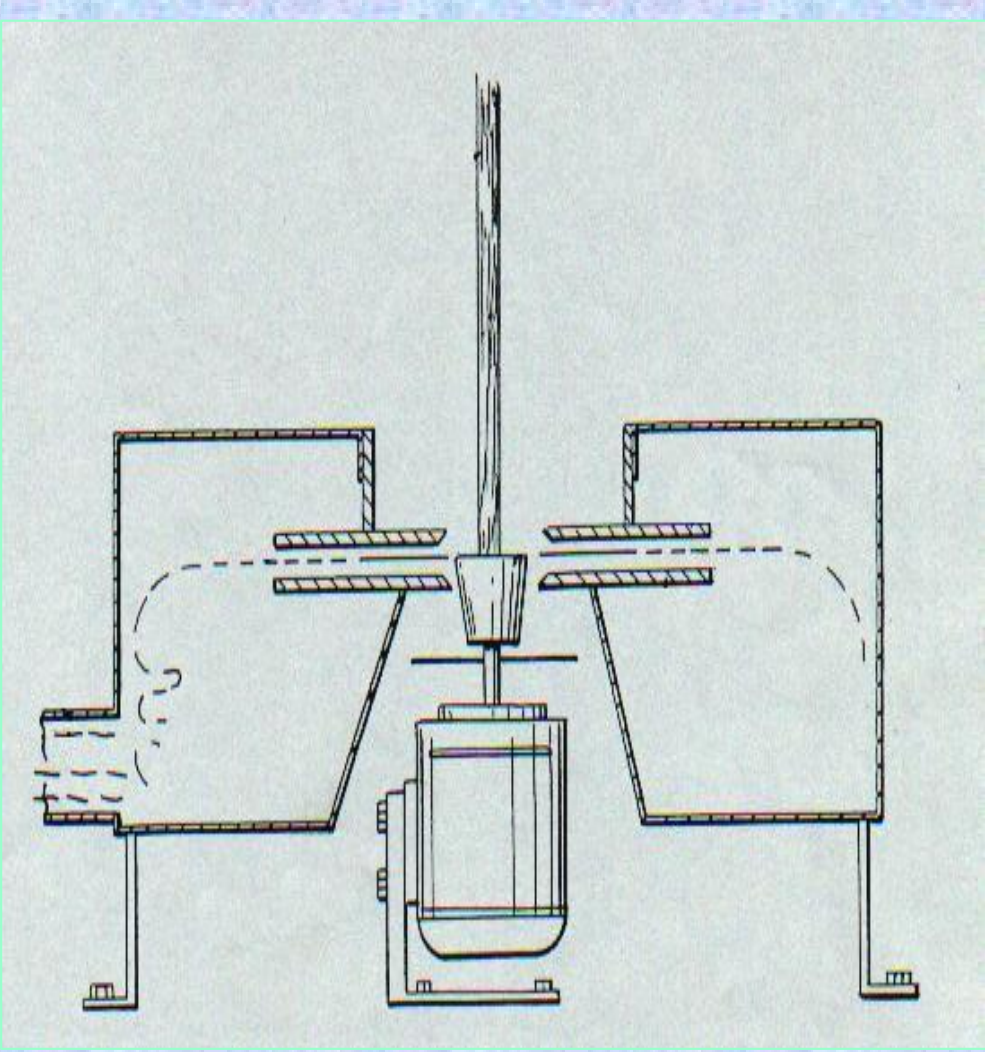

New Glass Flake Manufacturing Process

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The Corrosioneering Group works worldwide through operations in 37 countries, we have our own research and development personnel/team comprising, electrical/electronic engineers, mechanical engineers, corrosion engineers and chemists. 9 people in total.

We don’t require degree level for entry

We **employ both graduate and non graduate staff** to fulfil our requirements for technical personnel.

The things we do are not normally electrifying brain wracking technology but they address issues we need to address in our everyday life.

Are you teaching people to do that?

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Our technical Staff work in a variety of functions from projects management, production, feasibility analysis, sales and marketing through research and development and quality control.

Because of the nature of our work and in order to stay ahead of competition we need to be both inventive, innovative - cost effective and quick.

So what sort of work environment is there in an SME and what do we need of people to fit into that environment?

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SME’s tend to be less structured than large companies, either because the structure has not been developed or because it is unnecessary. There is both less and more chance for career advancement.

By dint of size, in an SME, personnel are less remote from management. Management are more aware of the personnel and their activities.

In an SME personnel are more aware of the company goals and objectives – costs and implications.

In an SME verbal reporting often has equal value to written reporting. But - written reports are more thoroughly read by management and are more readily actioned or acted upon.

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- Grades and rank are either not important or less important in an SME.
- Resources (equipment) in an SME are generally more readily available where costs are low to moderate. But - resources may not be available at all where costs are high.
- Resources by way of equipment and personnel are more controlled in an SME.

SME’s;

- Have a more flexible approach to many aspects
- Tend to act faster to change and work load variations.
- Boundaries between departments are often blurred or non existent.
- Personnel are more directly accountable
- Tend to have less stringent/rigid interpretation of Health and Safety requirements and risk.
- Communications between external contacts and the company are easier.

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I’m sure many of us can remember the days when you just did something.

The days when you did not have to prepare a budget and carry out a risk assessment

The days when you didn’t have to tell someone how many days it was going to take before you did it.

How much money each part would cost and what part of the project budget would be consumed

What the outcome was going to be!

How information would be disseminated

What the benefit in financial terms would be to the participants and of course the government.

THIS IN MANY RESPECTS IS SME TODAY!

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SME's employ **more than** 80% (eighty percent) of Graduates

Are SME views taken into account by the FE education legislature?

Before we move on to look at people requirements lets look at some basic business facts!

How can you tell what it will cost or how long it will take to invent something, or make something new, or improve something existing if you did not do it before?

You can not, and attempting to do that is inhibitive in many respects – although, **you can guess**, and accountants believe it's possible by waving sharpened pencils!

How long will it take to get into the market?

In reality – Anybody's guess!

In order for there to be business - invention, innovation and make something new there has to be

necessity or desire and the willingness to **take risk or gamble**.

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We are encouraged **not** to take risk but to **be safe** and that means not only with life and limb but with other aspects such as money. So we are conditioned

But - in business **there will always be risks**. The degree of risk can be controlled but non the less there will be risk. We need risk takers and people who understand risk.

When was the last time you stuck your head above the parapet?!

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Our Expectations of Graduate Applicants

Has interview skills!! Do you always dress like that?!!

Intelligent and logical can understand and give instructions

Literate "I wos not gud at spelin but I got a first in siense."

Articulate. How would you describe yourself? "What? Don't know really"!

Knowledgeable Can you repair a bicycle puncture? What's a bicycle!

Knowledgeable of their subject Well versed in the basics

Resourceful Able to find information and resources

Enquiring/Inquisitive Wants the whole picture, asking relevant questions

Hard working Not waiting for the clock to go around or playing computer games

NEXT!!

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PEOPLE REQUIREMENTS

I’m not qualified to do that!

People often conceive that if they have not been educated in XYZ and so, are *unauthorised* to do something – they can’t

But why?

Why do people perceive they can’t because they weren’t taught?

You can’t do that!

Why not?

Err, give me a minute and I’ll think of a reason;

- It’s too risky
- It won’t work.
- It won’t meet the regulations.
- It will cost a fortune.
- Its not been done before.
- It’s not my field but I don’t think it will work.
- Err, you just can’t

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How do we deal with that scene - these people?

Fire them!!!

You **can educate** people to **stop saying you can't** do that (without valid reason) and **encourage** them to say **lets try** this/that.

You can educate people to think, 'What can we do with this?'

Don't give me problems – Give me answers!

This is how we need our people in an SME – POSITIVE AND FLEXIBLE

We need you to educate them that way

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In anything there are both theoretical and practical considerations but often principles and full understanding are **developed after** the event and not before it. We often do not know **why things work** when they are first discovered/invented, they just do!

Do we need to know why they work?

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The **Wright brothers** were bicycle & carriage manufacturers and **not aeronautical engineering graduates**. A lot of people were killed in the early days of aviation finding out about aviation, they were interested in aviation wanted to do it and accepted the risks

Would a bicycle mechanic be allowed to design an aeroplane today? Would you want to fly it?!!

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The Answer is:

In America and some other Countries - YES

In some parts of Europe - POSSIBLY

In some parts of Europe including the UK – NO - NO

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Regulation endeavours to avoid risk

OVER REGULATION

kills, inhibits or hinders

business, innovation and invention

Are you feeling over regulated? Who is responsible and WHY?

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For innovation, invention and business to take place the attitude and environment has to be right.

But many things that an individual might do at home or on their own account they would not dream of doing in a work environment.

Cooking bacon or sausages for instance would be considered an unsafe work practice needing protective gloves, face mask, apron and fire extinguisher in the work place.

Yet, most people would laugh at you if you suggested those precautions to cook breakfast

People have to feel that they can take risks and gamble without fear of recrimination or ridicule.

They have to have a logical and progressive thought process and be determined to succeed.

They need to work in a team, to be able to sound out and bounce ideas, to get feedback.

THEY NEED EDUCATING TO DO THAT not regulating!

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We need the **right climate** at work for work, for efficient manufacture, for innovation and inventiveness.

And we need

the right people

We need

the right people with the right attitude

And

The right knowledge (or education)

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THE RIGHT EDUCATION

We don’t need someone educated as a chemist to be an accountant!

Education for us does not just mean academic studies but education in general, in life!

To work it is necessary to have **knowledge** and **in many cases** that means **a wide education** and in our view, **the wider the better,** because many aspects of what we do involve more than one area of science or technology and often several.

Environment, attitude and education are very important **but a degree is not!**

Communication skills - both verbal and written are important, and

logical thinking is essential

You did what?!!!

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Our education system often compartmentalises and sections people into specialisation areas.

Organic chemistry, inorganic chemistry, polymer chemistry, and specialist areas within those areas. What's wrong with chemistry?!

Simplistic yes, but people are given knowledge but rarely ask themselves what they can do with it!

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Of course we need specialist but how many? If everyone is a specialist in a confined or limited area, how do we get crossover and cross fertilisation of ideas and how do things requiring multi discipline technologies evolve – perhaps by a committee of specialists?!

As an SME we can't afford them

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Specialisation can be detrimental and lead to a lack of understanding in the general picture. **A piece of jigsaw puzzle on it's own is no use**, but if you are only one or two pieces missing, you can assess or often guess, what is not there!

Therefore a broad knowledge is required **before** specialised knowledge.

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The people we as an SME need;

Can think for themselves

Are not afraid to ask questions

Are prepared to listen to others

Find answers and proffer solutions

and most of all have a wide knowledge base

We need specialists –

but only for a small percentage of the time and we can hire them in from Specialist Consultants or Universities! What percentage of people are needed in pure research?

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Our two most imaginative and productive R+D staff don't have degrees.

BUT

They both have a wide variety of knowledge and experience. That experience ranges from math, electrical engineering, mechanical engineering, electronics, fluidics, pneumatics, etc., etc.

A DIFFERENT KIND OF EDUCATION!

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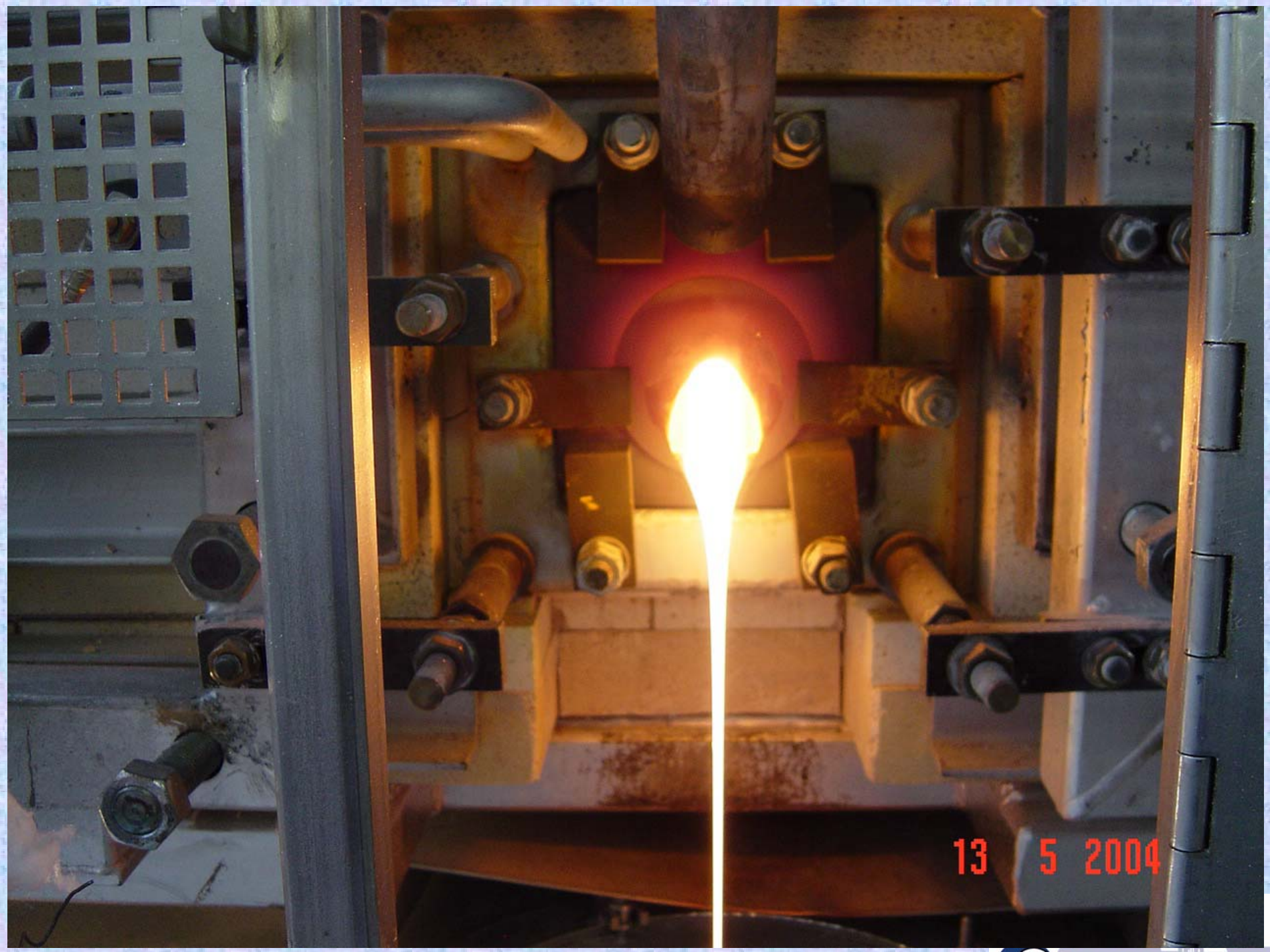

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What do the people who did this have in common?

They were educated part time whilst working for a living and gaining experience.

The knowledge they gained was applied as they learned it, it related to what they were doing at the time they were doing it.

They learned to apply knowledge in a practical way to achieve an end result.

They learned how and where to find knowledge they didn’t have

They learnt to do it as part of a team or in association with others

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Isn’t that how universities started life – with a student or students working alongside a master to achieve a goal and learning the intricacies.

With education, regardless of level, people will be innovative.

Higher levels of education will give higher levels of knowledge but not make them more innovative.

A broader education will.

Regulation and bureaucracy are restraining and inhibitive.

Attitude is important

Environment is important

Management and decision making processes are important.

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What do we look for when employing a technical team member and what do we need?

The ability to express themselves well, both written and orally

Self motivation and wide ranging interests.

Practical application of knowledge.

An inquisitive mind

A logical mind

A willingness to be open and not skirt around issues

A can do, let’s try approach

A willingness to work with others, seek and give help

Determination

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What would we like to see from our Universities?

Students accepted on courses more for their **overall** abilities

The teaching of better **expression and communication** skills

Wider education with more **combined courses**

Teaching better discipline in **recordal skills**

Teaching better, the ability to **reason and question**

Working together to solve problems rather than as individuals

More **work experience** in a real and **relevant** work environment

Large companies and Universities employ a very small percentage of graduates compared to SMEs but education is more often tailored around the former – **it needs to change!**

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THE END

Thank you for listening and your consideration

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