

Environmental and Economic Assessment of the Replacement of Grease based on Mineral Oil for Fiberglass fabric with Teflon[®] as Release Agent in Dubbing Process

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Introduction

A search of companies by clean and sustainable technologies has been growing considerably. An alternative is the Cleaner Production actions, aimed at non-generation, minimization or recycling of waste.



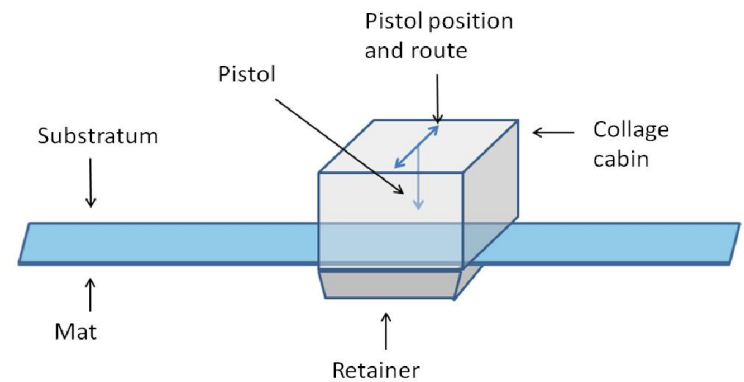
Introduction

- The Cleaner Production implementation can reduce costs and improve process without large investments;
- Waste reduction or even no generation is able to bring considerable economic gains, as his disposal generates economic losses (SEIFFERT, 2011).



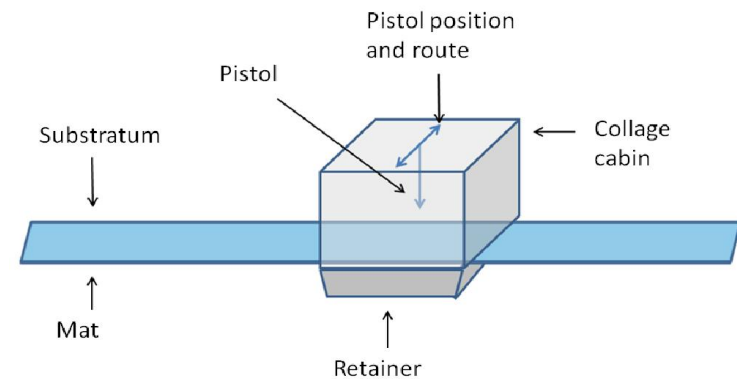
Introduction

- The dubbing process makes the use of polyurethane adhesive as adhesive material;
- The process occurs within a cubic cabin;



Introduction

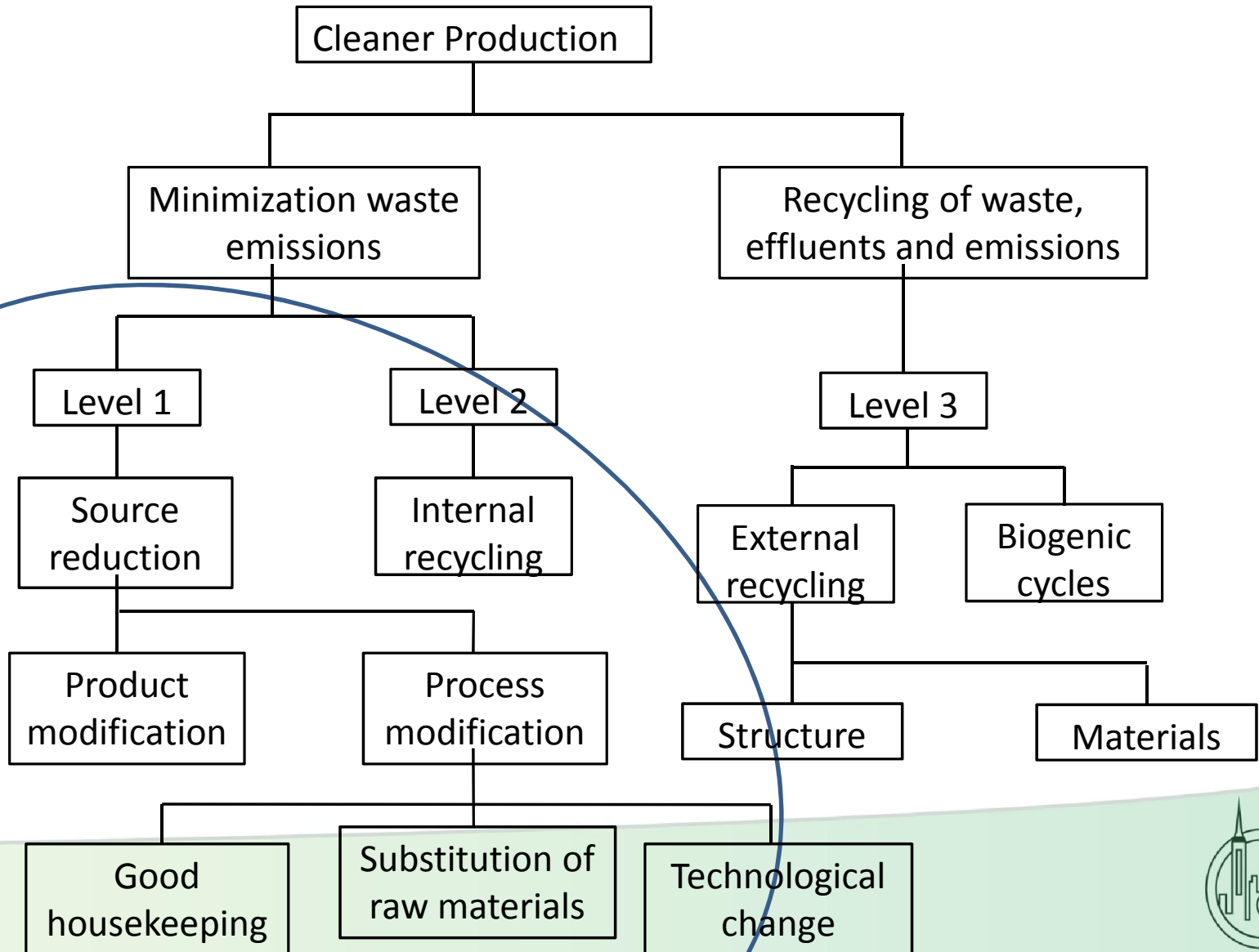
- The application of the adhesive is made with a specific gun that releases an adhesive spray on the substratum.
- Part of the adhesive adheres the walls and should be removed and disposed as waste;



Introduction

- Mineral base oil comprises a complex mixture of predominantly paraffinic hydrocarbons, containing additives and hydrated lime (IPIRANGA, 2012);
- Cleaner Production actions.





Main Objective

Look for an alternative economically and environmentally feasible to replace the grease on mineral oil base in the dubbing process.



Methodology

- It was necessary to find an alternative that would act the same way as the grease without contaminating the waste.

Fiberglass fabric with
Teflon®

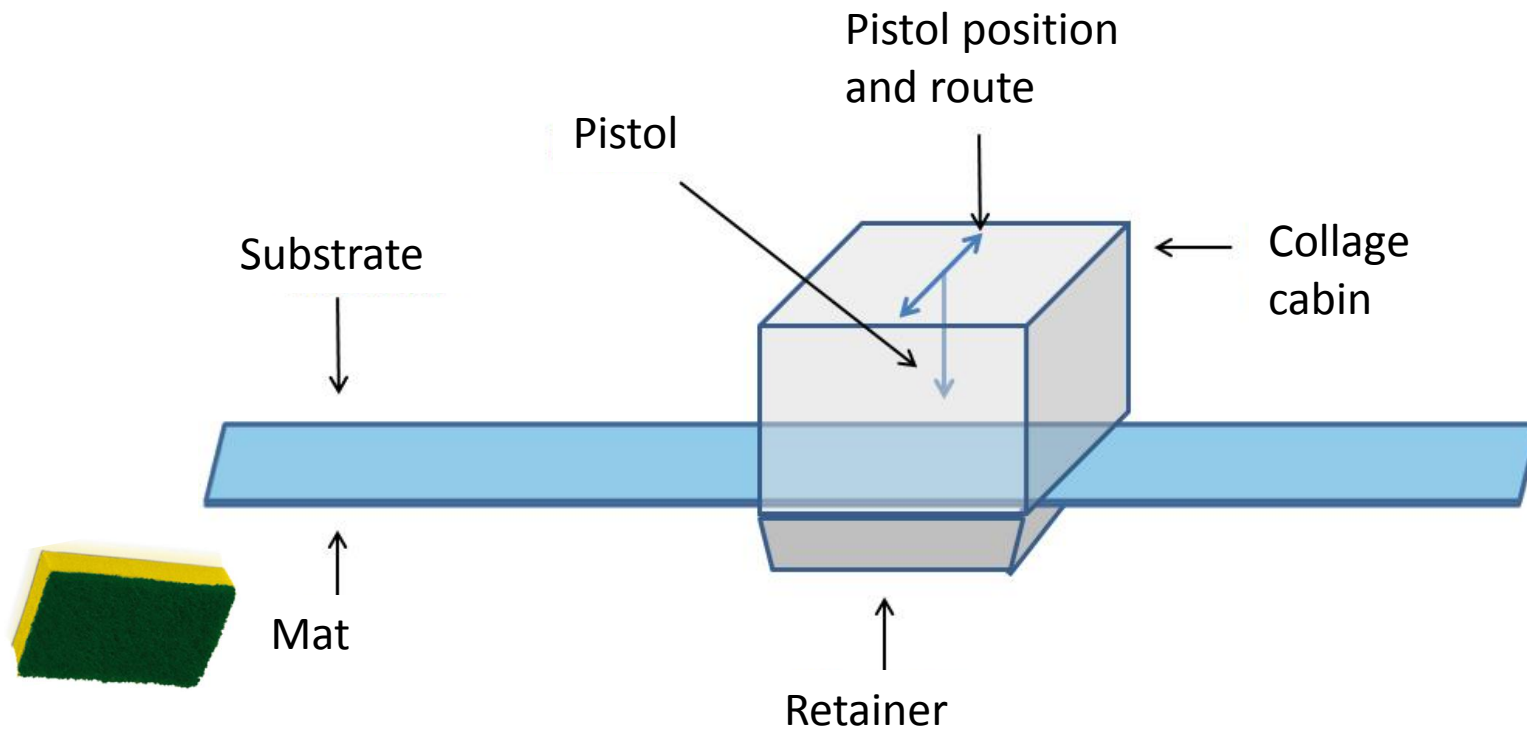


VAROFLON, 2015.

- Inert material
- Good thermal resistance
- Low coefficient of friction
- It has adhesive on one of its faces
- Shipped in large rolls



Methodology



- The company generates on average 10m³ of waste contaminated with grease per month.



Methodology

The research was divided into three steps:

- Laboratory test
- Test for bonding cabin
- Implementation



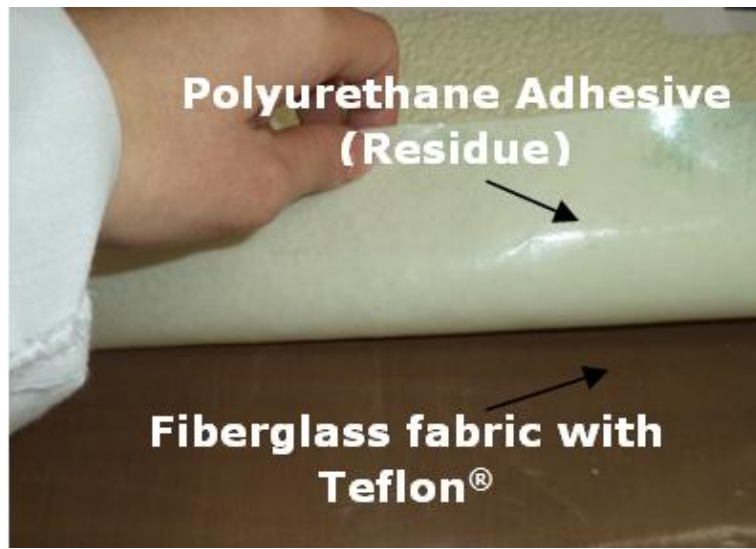
Resultados

- Laboratory test: it was prepared a small amount of polyurethane adhesive, poured over the material to be tested and observed that its removal was extremely easy.

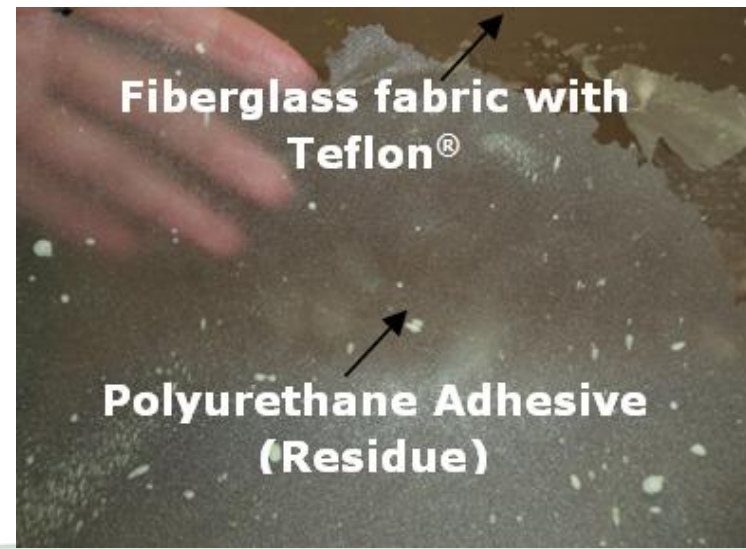


Results

- Test for bonding cabin: were placed two small samples of glass fiber fabric with Teflon[®] into the cabin.



Large deposition of residue on the Teflon[®]



Small deposition of residue on the Teflon[®]



Results

- Implementation: Exchange of PA walls, care to prevent blistering and amendments.



Results

Data collection	
Cost of Grease	R\$ 6.25/Kg
Consumption of grease/month	200 Kg
Generation of residue/month	10 m ³
Cost of class I waste disposal	R\$ 114.0/m ³
Cost of glass fiber fabric with Teflon [®]	R\$ 123.0/m ²
Cost of PP board	R\$ 16.25/m ²
Cabin area	19.40m ²
Total cabin cleaning time (grease)	1 h

- From the data obtained it was concluded that in the 1.1 months spent on the exchange of the release agent would be economically compensated.



Results

There are also environmental benefits such as the elimination of the possibility of soil and water pollution and the elimination of a toxic raw material.



Results

- The total substitution of grease is clearly a level 1 action of Cleaner Production;
- The reuse of polyurethane adhesive, which is still a residue, is being studied and may also meet as action level 2 or 3.



Conclusion

With the change of grease at fiberglass fabric with Teflon[®] it was possible to shorten the bonding booth cleaning, reduce costs and avoids the contamination of the polymer residue generated.



Conclusion

- The no generation of 10 m³/month of a hazardous waste, and process grease disposal, reach a possible saving of R\$ 2,390.0/month;



References

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Thank You!

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