



Plastics Circularity  
Multiplier

## Plastics Circularity Multiplier Online Conference

14 - 15 - 16 October 2020



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**IRIS**

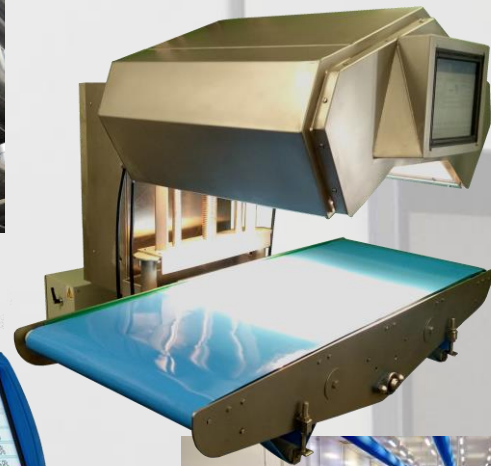
Improving circularity efficiency  
by means of Process Analytical Technologies

IRIS Technology Solutions SL (Barcelona)

Alejandro Rosales (Sci & Tech Manager)

# About IRIS Technology Solutions

- ✓ More than one decade in the market
- ✓ Facilities and offices in Barcelona and Madrid
- ✓ 70 highly qualified multidisciplinary staff
- ✓ Among the top-10 SMEs with H2020 granted R&D projects
- ✓ Manufacturers of industrial-grade NIR analyzers and **hyperspectral imager proprietary product line** under the Visum trademark
- ✓ Developers of tailor-made cloud-based software platforms with built-in AI tools
- ✓ Providers of advanced engineering services for undertaking novel applications and integrating turn-key solutions



# Why is PAT the right source of information for driving sustainable processes?

**Process Analytical Technology (PAT):** Controlling a process based on the **functional aim of the process**, as opposed to supervising and maintaining the assumed optimal conditions based on traditional recipes:

- ❖ Availability of a sufficient quantity of informative and reliable data not only about the external conditions of the process, but also about **what is happening in the process** itself, i.e. a combination of sensory and PAT data.
- ❖ Unveil hidden relevant information from the data via ICT resources founded on **Artificial Intelligence** tools in order to build **Decision Support Systems that are free from cognitive biases and prejudices.**

Efficiency is the key requirement for any process intended to be sustainable because sustainable efficiency is a **dynamically constrained optimization** problem: maximizing yield by simultaneously minimizing environmental, economic and social impacts in a continuously changing context.

That implies systematically using cost-effective **intelligent automation** based on a golden combination: PAT and AI.

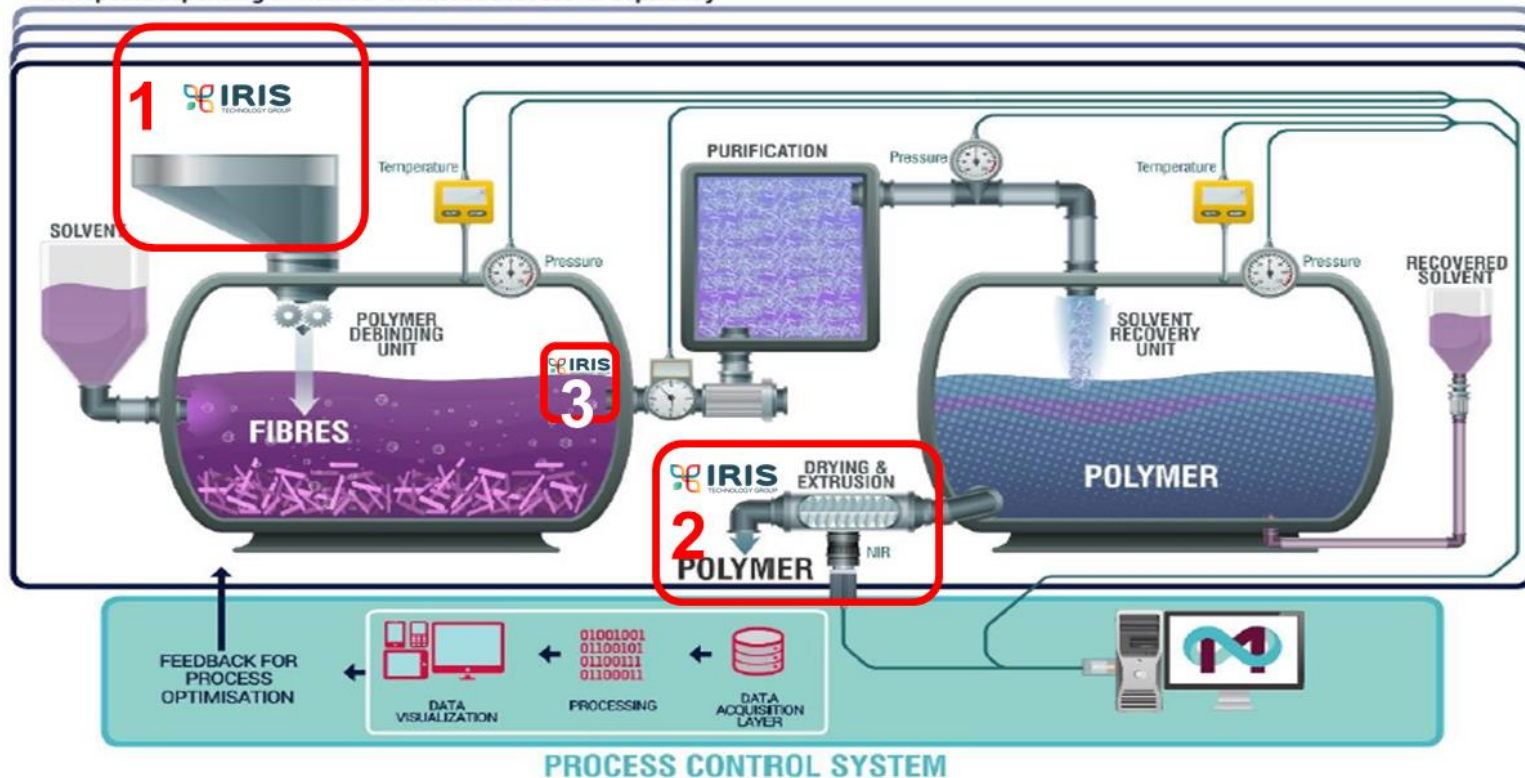
# MultiCycle

## Advanced & sustainable recycling processes and value chains for plastic-based multi-materials

Coordinator	IRIS
Call topic	SPIRE 10 topic “Efficient recycling processes for plastic containing materials” (CE focus) (IA)
Consortium	19 partners from 10 countries
Start - End	1/11/2018 - 31/10/2021 (3 years)
Overview	<b>MultiCycle</b> is aimed at delivering an industrial recycling pilot plant for thermoplastic based multi-materials using the patented <b>CreaSolv®</b> (Fraunhofer) process as a key enabling step towards the realization of a circular plastics economy. It will be demonstrated for multilayer packaging / flexible films and fibre-reinforced thermoplastic composites in the automotive sector.

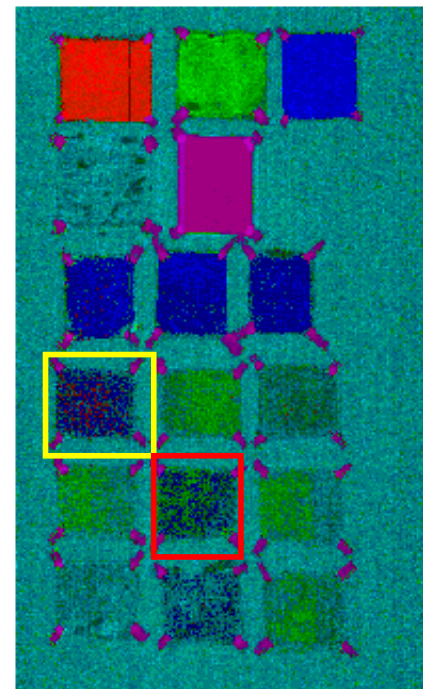
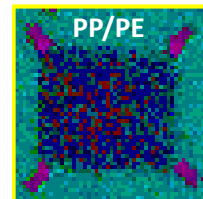
# MultiCycle

*n* repeats depending on number of fractions to recover separately

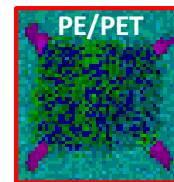




# MultiCycle - Hyperspectral (SWIR) imaging



- Y Predicted 1 (PP)
- Y Predicted 2 (PET)
- Y Predicted 3 (PE)
- Y Predicted 4 (OPA)
- Y Predicted 5 (paper)



$$H(p) = -\sum p(i) \log[p(i)]$$