Joining Sub-Platform

Industrial Challenges in Joining

Soldering of PCBs

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(2017-11-16)



FineSol

Assembly of miniaturized PCBs by using low cost hyper-fine solder powders

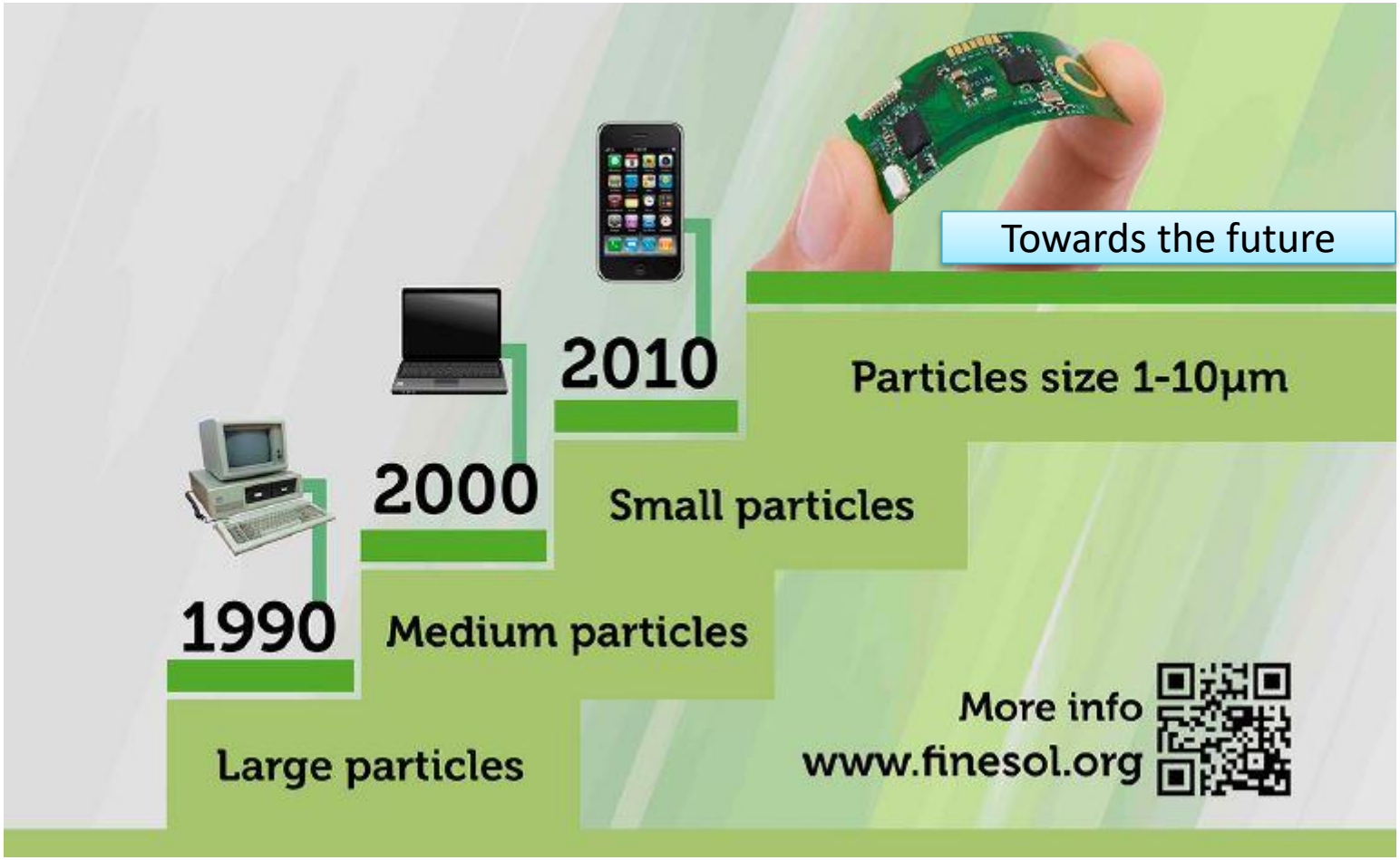
HORIZON 2020
SPECIFIC PROGRAMME: KET ADVANCED MANUFACTURING SYSTEMS AND BIOTECHNOLOGIES
THEME: [FoF-12-2014] GRANT AGREEMENT NO: **680718**

JOINING

Perspective

The total EU electronics industry employs ≈20.5 million people and is a major contributor to EU GDP as its size continues to grow fuelled by consumers demands.

Where are we going?



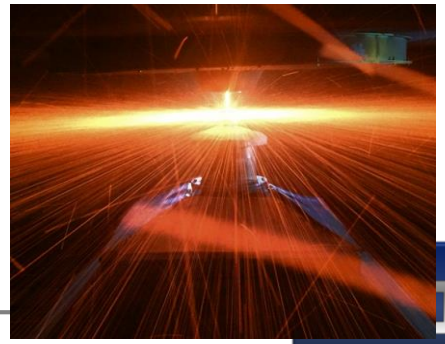
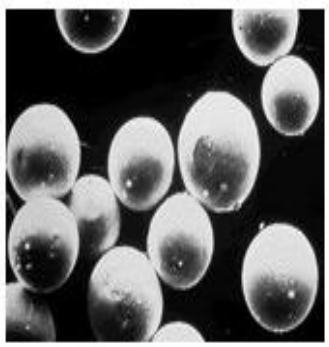
Current State-of-the-art

The key current road block/limitation to achieving the goal of ultra-miniaturisation/ functionality is how to increase the component density on the printed circuit board (PCB).

Commonly used solder pastes/powders in the market are of type 3-4 (**38-64 µm**)

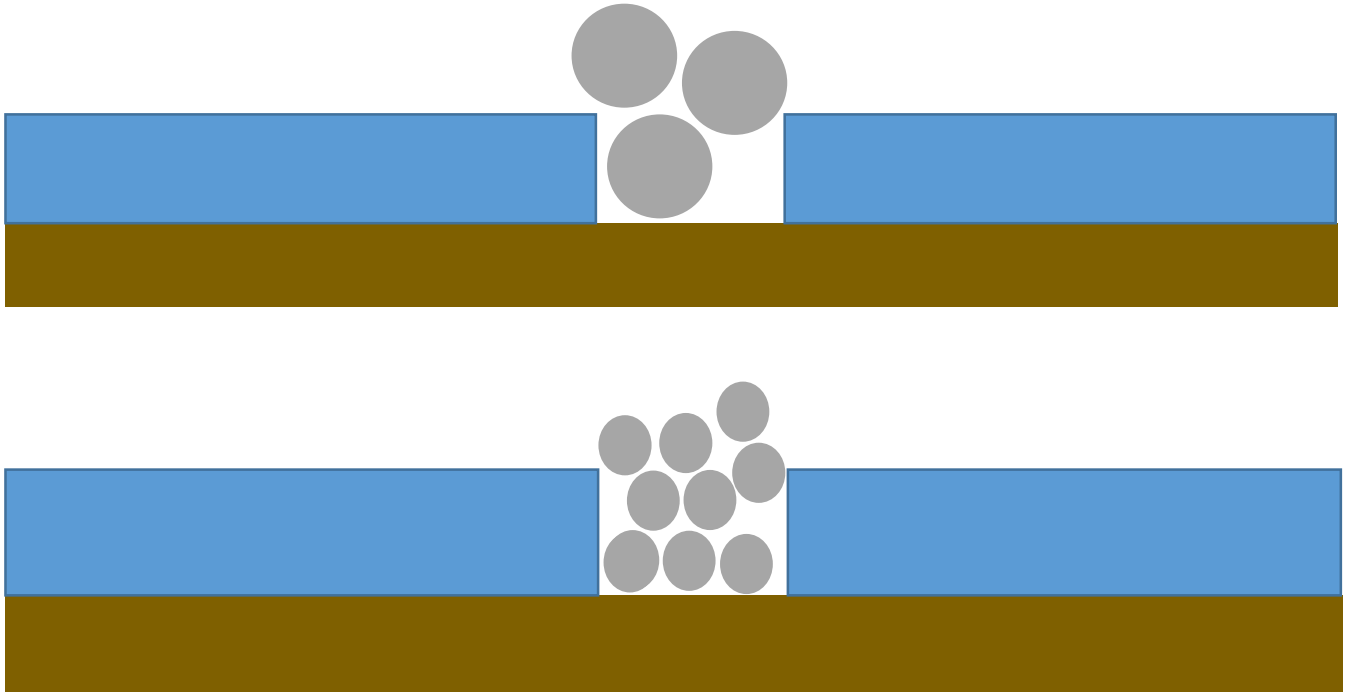
Solder pastes/powders of type 7-8 (**2-15 µm**) are either not available at all or not available on a commercial mass commercial scale

The goal of the FineSol project is the production of hyper fined solder powders beyond type 8 and of particles size 1-10µm



Why is the particle size of the solder powder crucial?



Gray balls = Solder powder

Blue Layer = stencil mask

Brown Layer = PCB

Bigger balls don’t “fill the gap”

Smaller balls fill it in bigger percentage

We need smaller particles to achieve smaller printed features

Why is there a challenge to produce smaller particles?

- OXIDATION!!!



- If particles smaller, thickness of oxide does not change → oxide to metal ratio increased → solderablility of paste decreases
- FineSol will eliminate or decrease the oxidization by using protective coatings.

How FineSole will solve this challange

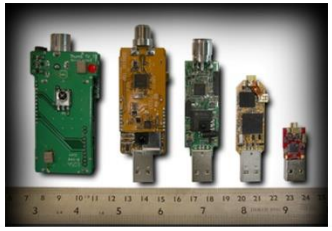
Fabrication of Modified Atomization Production Line



Production of solder Powders beyond type 8



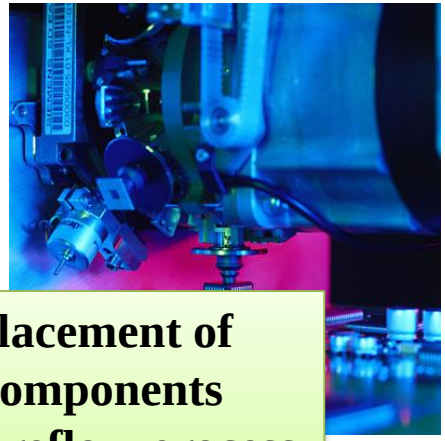
Formulation & Production of Solder Pastes



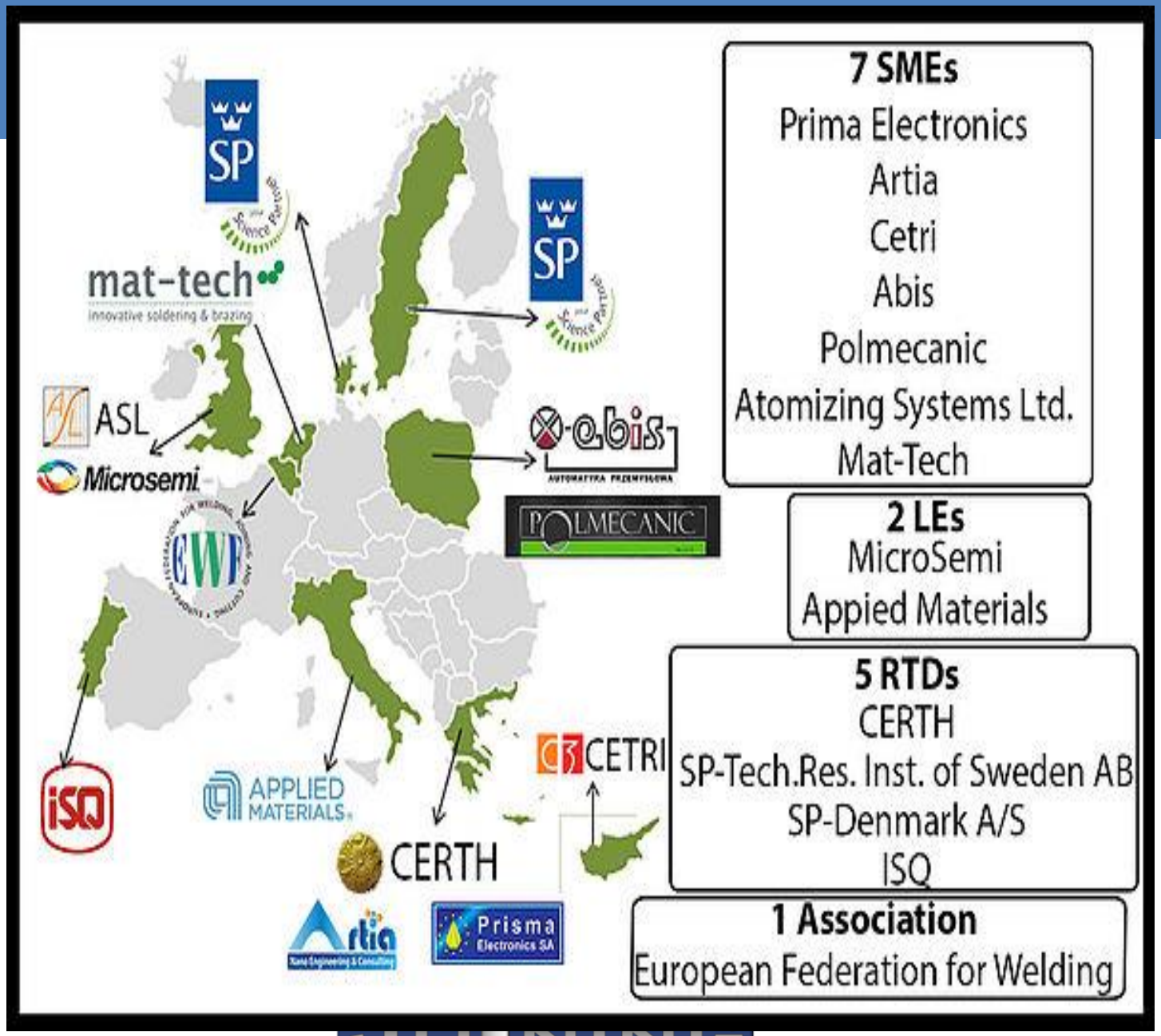
PCB Miniaturization

Screen and jet printing of pastes





Placement of components and reflow process


SP
mat-tech
innovative soldering & brazing
SP
ASL
Microsemi
POLMECANIC
CETRI
APPLIED MATERIALS
iSQ
CERTH
Artia
Prisma Electronics SA
7 SMEs
Prima Electronics
Artia
Cetri
Abis
Polmecanic
Atomizing Systems Ltd.
Mat-Tech
2 LEs
MicroSemi
Appied Materials
5 RTDs
CERTH
SP-Tech.Res. Inst. of Sweden AB
SP-Denmark A/S
ISQ
1 Association
European Federation for Welding



Thank you for your attention!

CE.R.T.H
Centre for Research & Technology Hellas

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