



GS-PRO

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# Improved Sustainability for Nylon 11 Laser Sintering Material

- GS-PRO GmbH
- State of the Art
- Material efficiency
- Options for new Materials
- Conclusion

- Founded in 2011
- Based in Chemnitz, Germany
- Offering developing services for AM - Processing Material, Material testing,  
Optimizing Parameters for high efficiency and/or max. Properties
- Providing refinement of used LS-powder
- Worldwide service

## ■ Materials

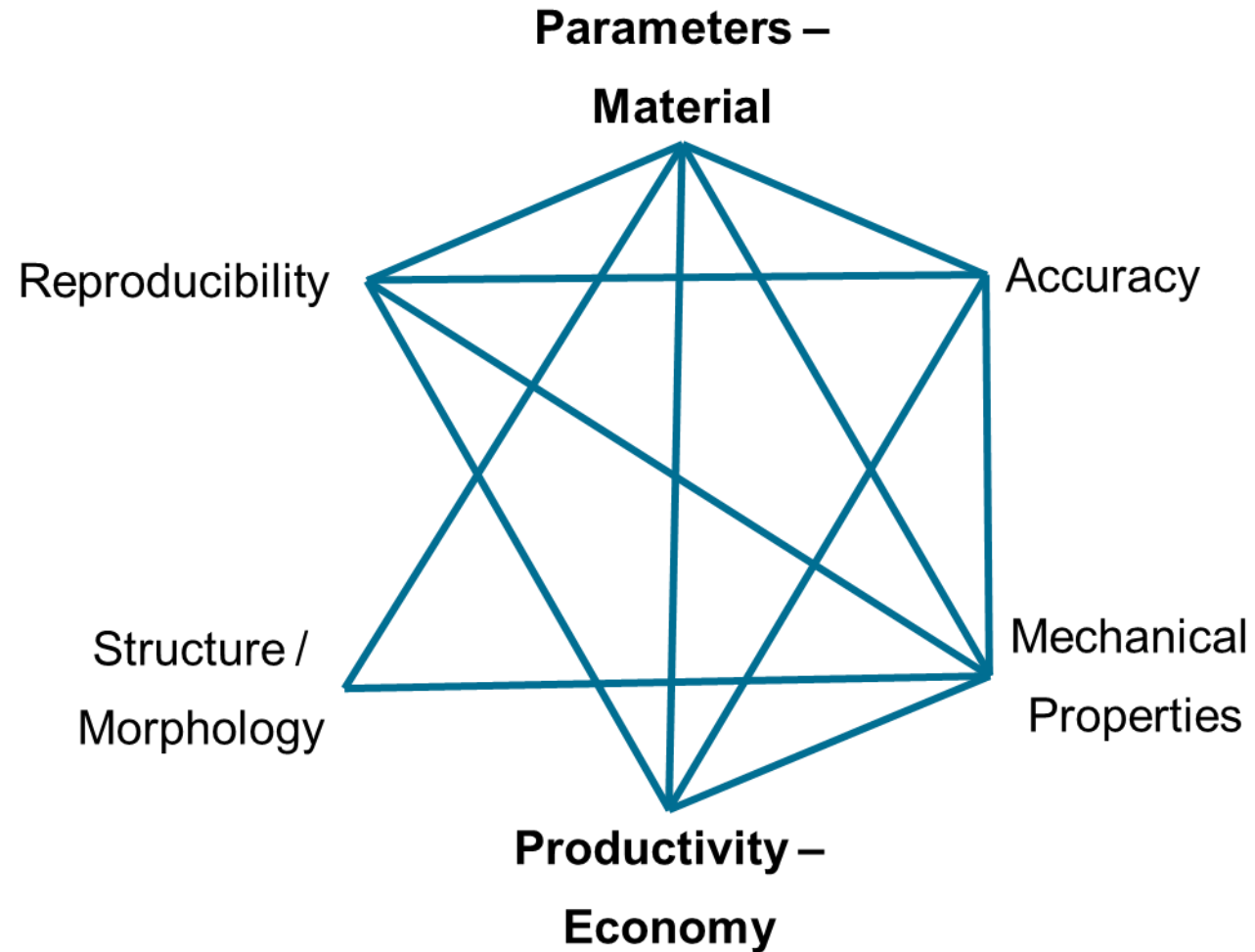
- State of Art materials: PA11, PA12
- Filled materials: GF, CF, Al...
- Flexible: TPU

## ■ Potentials and Branches

- specific properties
- Process speed
- Material efficiency
- Automation of the whole process

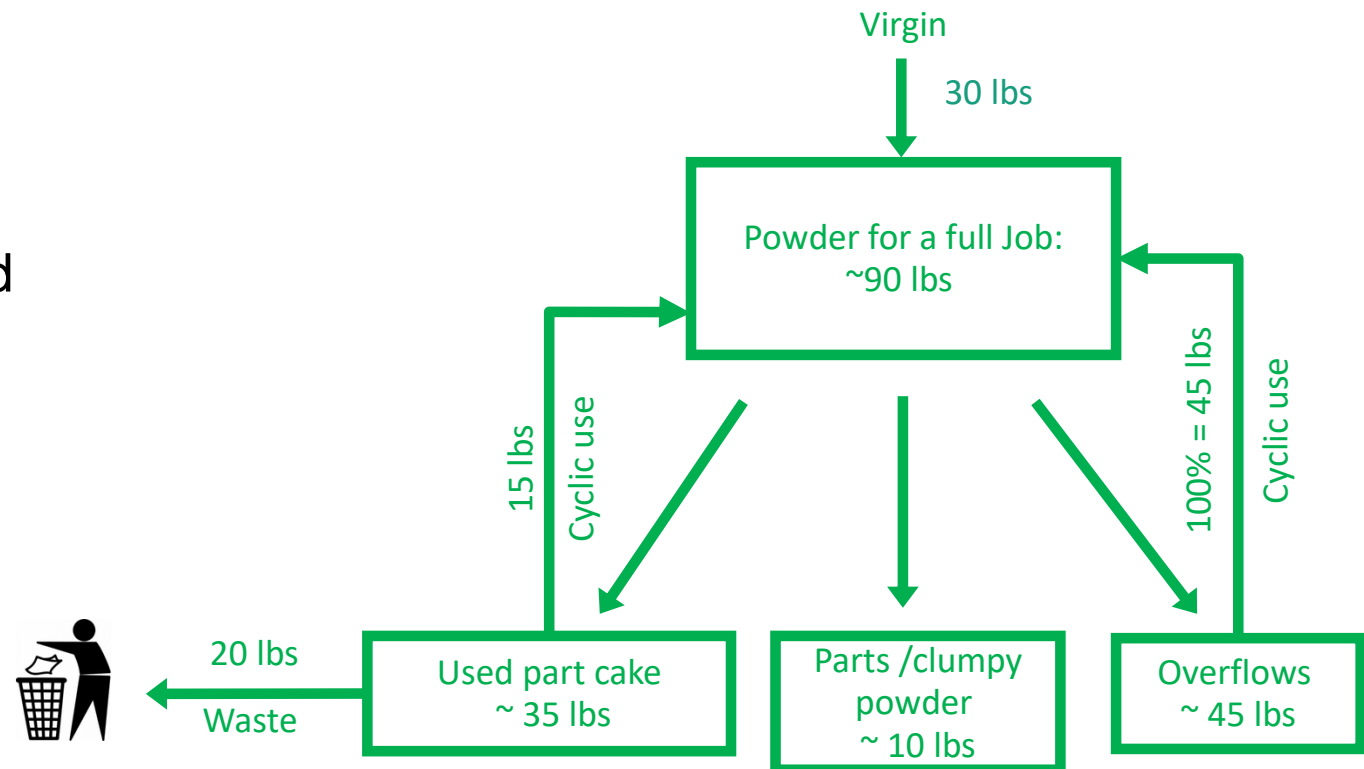


# Optimizing SLS-Materials



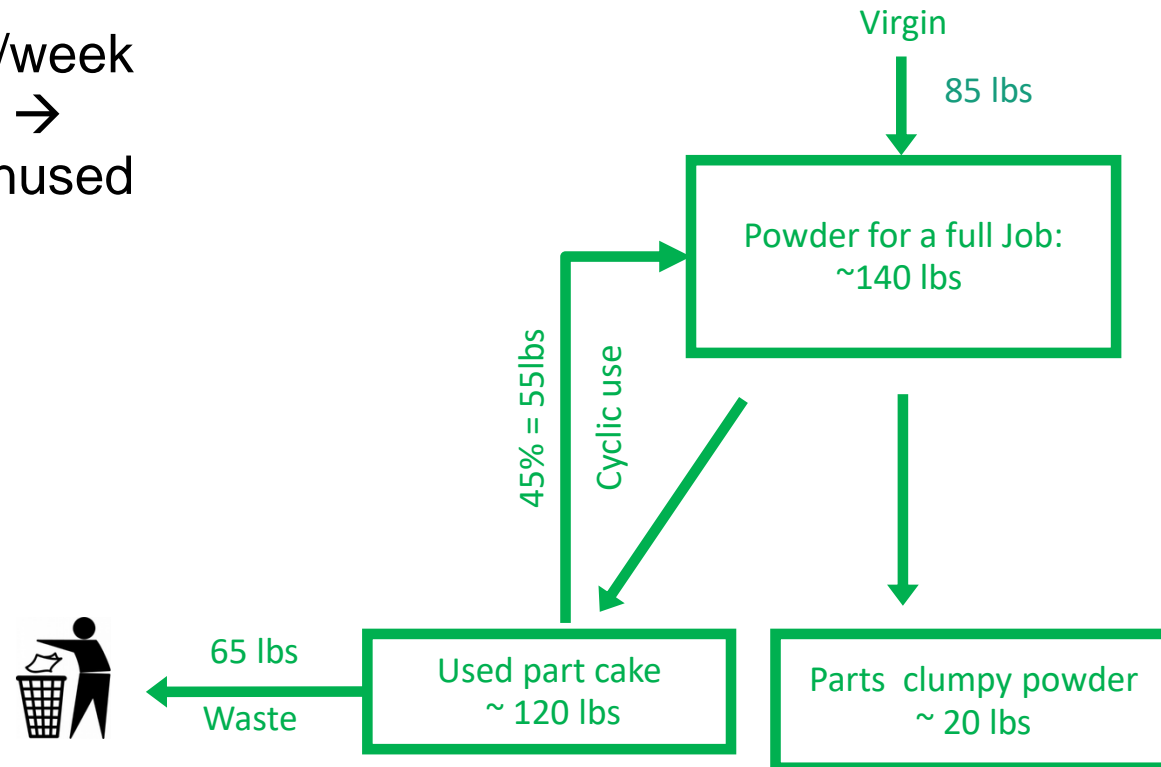
- Significant amount of used powder can not be used again due to aging → DISPOSAL
- A machine working Ø 100 h/week causes up to 3.000 lbs waste → over 130.000USD per year unused potential

Example: Vanguard / sPro 60 with Standard PA11-Powder



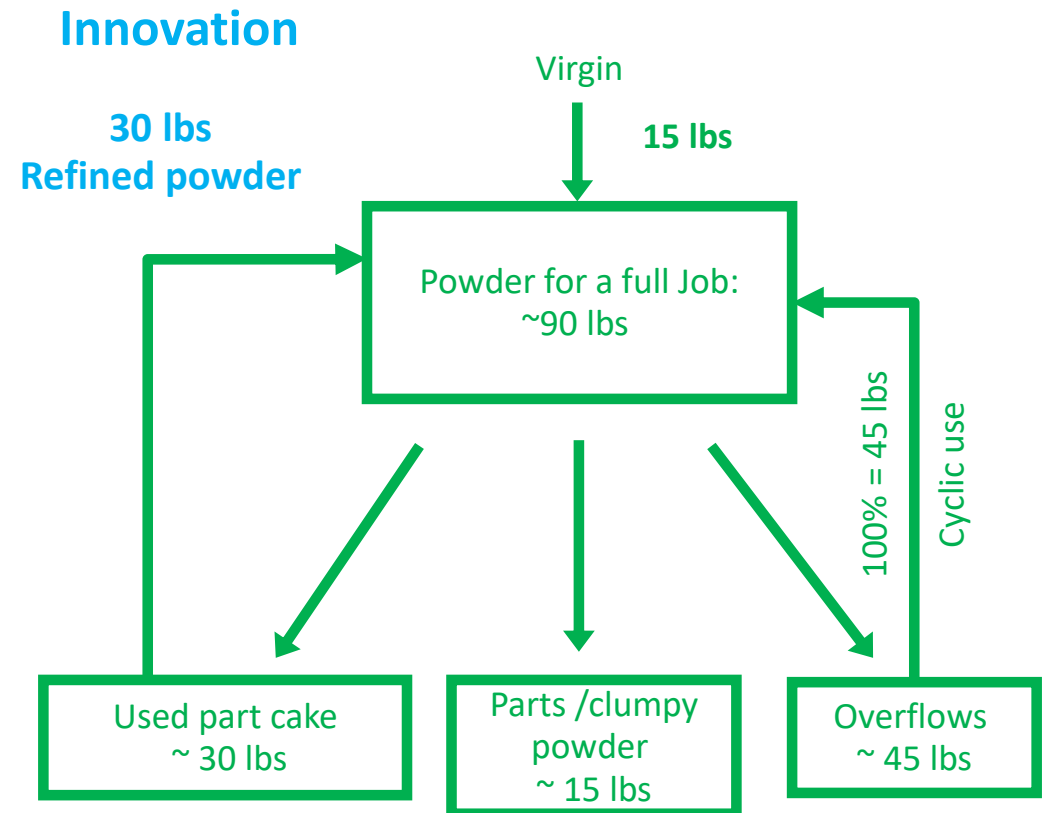
- Significant amount of used powder can not be used again due to aging → DISPOSAL
- A machine working Ø 100 h/week causes up to 8.000 lbs waste → over 340.000USD per year unused potential

Example: Vanguard / sPro 140 with Standard PA11 - Powder



- A closed powder loop can be set up for unfilled PA11
- A machine working  $\emptyset$  100 h/week saves up to 3.000 lbs waste  $\rightarrow$  over 60.000USD per year

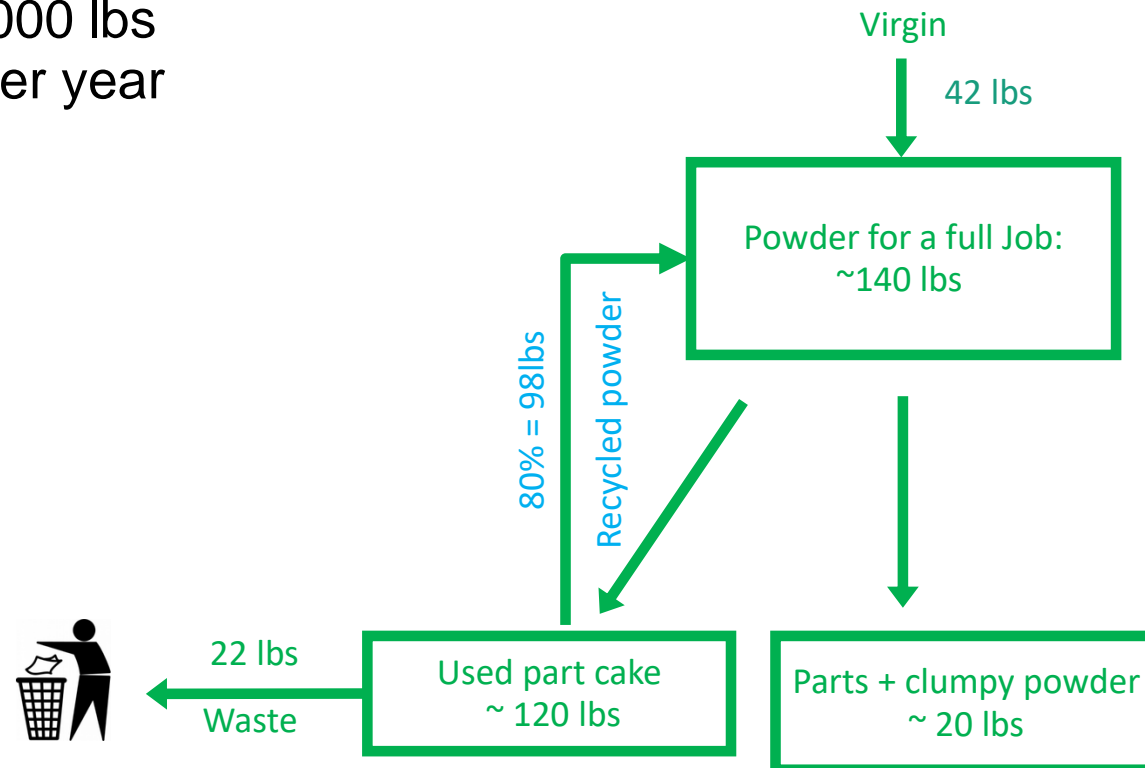
Example: Vanguard / sPro 60 with Standard PA11-Powder





- Significant lower amount of waste
- A machine working  
 Ø 100 h/week saves up to 7.000 lbs waste → over 150.000USD per year

Example: Vanguard / sPro 140 with Standard PA11 - Powder



## Mechanical properties

### ALM 850 black (Standard)

|       | Density           | Tensile strength           | Young Modulus              | E at B |
|-------|-------------------|----------------------------|----------------------------|--------|
| Units | g/cm <sup>3</sup> | N/mm <sup>2</sup><br>(psi) | N/mm <sup>2</sup><br>(ksi) | %      |
| Value | 1.03              | 48<br>(6,900)              | 1.500<br>(215)             | 51     |

### Duraform-EX-Black

|       | Density           | Tensile strength           | Young Modulus              | E at B |
|-------|-------------------|----------------------------|----------------------------|--------|
| Units | g/cm <sup>3</sup> | N/mm <sup>2</sup><br>(psi) | N/mm <sup>2</sup><br>(ksi) | %      |
| Value | 1.01              | 48<br>(6,900)              | 1.500<br>(220)             | 47 %   |

### PA11 „Sustainable“

|       | Density           | Tensile strength           | Young Modulus              | E at B |
|-------|-------------------|----------------------------|----------------------------|--------|
| Units | g/cm <sup>3</sup> | N/mm <sup>2</sup><br>(psi) | N/mm <sup>2</sup><br>(ksi) | %      |
| Value | 1.02 –<br>1.04    | 48<br>(6,900)              | 1.500<br>(220)             | >40%   |

- Significant higher efficiency through use of refined LS-powder
- Less influences by variation of raw powder – higher repeatability
- Less fairy frost due to less virgin powder – less service – less down time
- Reducing waste and carbon foot print

**Thank you very much!**

**GS-PRO GmbH**

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