**Purpose**
There is increasing interest in roller compaction as an alternative method to wet granulation. Recently, a new type of dry binder copovidone was developed: Kollidon® VA 64 Fine. Investigation on the application of Kollidon® VA 64 Fine in direct compression demonstrated a considerably higher binding efficiency compared to Kollidon® VA 64, due to its smaller particle size [1] [2]. Similar results were obtained for Kollidon® VA 64 Fine in roller compaction, investigating the effect of binder concentration [3]. The goal of this study was to investigate the dry binding efficiency of Kollidon® VA 64 Fine in roller compaction using acetylated saccharide (ASA) as a model drug. For evaluation of the effect of dry binder particle size and structure, Kollidon® VA 64 served as reference material.

**Materials**
The following materials were used:

- Kollidon® VA 64 Fine (BASF Aktiengesellschaft, Germany), Kollidon® VA 64 Fine (BASF Aktiengesellschaft, Germany), Avicel® PH 102 (FMC Biopolymer, USA), acetylated saccharide (ASA, Fagron GmbH Co. KG, Germany), Kollidon® CL (BASF Aktiengesellschaft, Germany), and magnesium stearate (Baierlocher GmbH, Germany).

Characterization of tablets compacted with Kollidon® VA 64 Fine (3% w/w) demonstrated that higher drug content resulted in lower tensile strength with increased friability, while the disintegration time was reduced (figs. 4-6). Tablets with 40% drug content compressed at 18 kN had a tensile strength of 1.43 N/mm² whereas at 80% drug content 1.1 N/mm² tensile strength was obtained. The friability increased from 0.24% to 0.34%. However, even at high drug loading harder tablets with lower friability compared to Kollidon® VA 64 were obtained. Friability stayed well below 0.42% for all compression forces.

**Results**
Decreasing particle size and changing structure of the dry binder in a formulation with 40% drug content led to a reduction of fines <180 μm from 66% to 54% in the compaction process applying 3-5 kN/cm followed by disintegration of the ribbons with a granulator of 1.25 mm mesh sieve. The fraction of fines <180 μm was determined and separated by sieve analysis (Retsches GmbH, Germany).

Characterization of granulate: The granules were characterized with reference to bulk density (Erweka, Germany), particle size distribution (laser diffraction, Mastersizer 2000, England) and flowability (Pentire funnel).

- Compression: Tablets (12 mm, 700 mg) were manufactured with a single punch press (EKO, Korsch, Germany) applying 10, 18 and 25 kN and characterized with reference to tensile strength (Kramar TT51, Germany), friability (ERWEKA TAR, Germany), and disintegration time (ERWEKA ZT 74, Germany).

**Conclusions**
- High binding efficiency of Kollidon® VA 64 Fine in roller compaction due to the small particle size and different structure thus
- Allowing for manufacturing tablets of ASA up to 60% drug content via roller compaction by efficiently
  - reducing the fines and
  - increasing the tensile strength of tablets while
  - reducing friability

**References**

**Figures**
1. Particle size distribution
2. Influence of the particle size of the binder on the fraction of fines
3. Comparison of the effect of different sized Kollidon® VA 64 on the tensile strength of tablets
4. Influence of the drug loading on the hardness of tablets
5. Influence of the drug loading on the friability of tablets

**Tables**

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**Application of Kollidon® VA 64 Fine in roller compaction**
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