

Kollidon® VA 64
Kollidon® VA 64 Fine

**Dry binding at its best:
strong compaction.**

Plasticity

pharma
SOLUTIONS

- Excipients
- Actives
- Contract Manufacturing
- Value Added

 **BASF**

The Chemical Company

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The Preface

The “best dry binder ever”, Kollidon® VA 64, is now topped by Kollidon® VA 64 Fine.

BASF's latest development:

The extremely small particle size results (15 – 20 µm, VA 64: 75 – 90 µm) in

- improved plasticity
- improved dry binding capacity

The consequence:

economical manufacturing processes that increase profit margins.

Technologies:

Direct compression

Roller compaction (dry compaction)

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Generally, dry binding (either in roller compaction or direct compression processes) is beneficial in terms of:

- Economy:
 - Less time
 - Less manpower
 - Less machinery
- Validation and cleaning procedures are less complex
- Easier fulfillment of cGMP requirements
- Stability is often better than with wet granulation



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Comparison between wet granulation and direct compression

	Wet Granulation	Direct Compression
Mixing	High-shear mixer – high energy consumption	Low-shear mixer or a free-fall mixer
Flowability	Excellent	Glidant (e.g. Aerosil) often required
Compression behavior	Compressibility increased due to granulation step	Could be problematic with high dosages of poorly compressible actives; dry binder necessary
Content uniformity	Segregation possible after drying	Segregation during transport or tableting possible
Costs	Intensive use of machinery, very time-consuming, extensive process validation, high energy consumption	Less machinery needed; costs are mainly driven due to higher excipients costs
Flexibility of the method	Good batch-to-batch uniformity	Exact specification of excipients essential
Stability of the tablets	Poor for heat or moisture-sensitive drugs	Very good stability



Pharmacopoeia:

Kollidon[®] VA 64 and Kollidon[®] VA 64 Fine fulfill the requirements of the current Ph.Eur. and USP-NF monograph “Copovidone” and the JPE monograph, “Copolyvidone”. A US-DMF with the number 6745 has been submitted in the United States.



GRAS status:

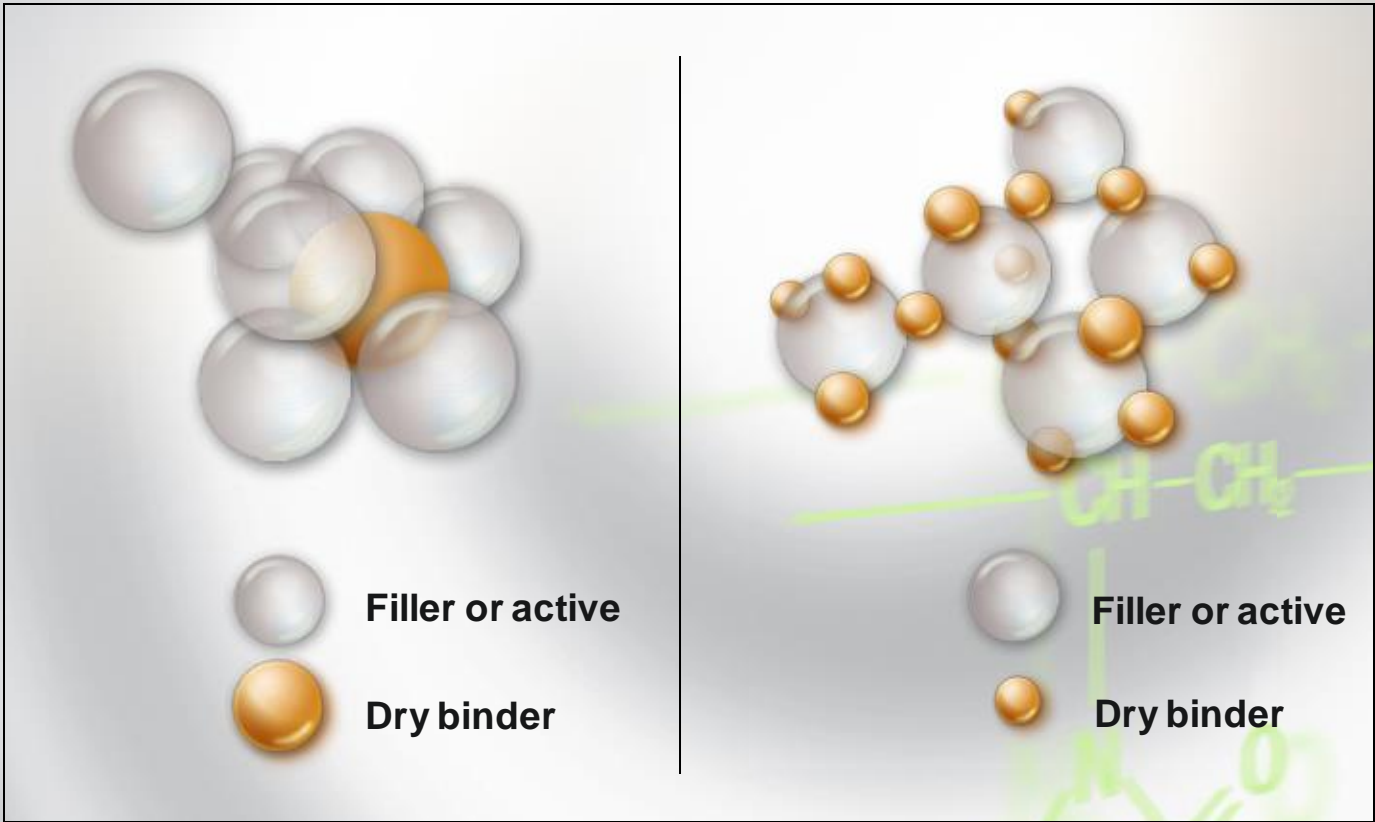
Kollidon[®] VA 64 and Kollidon[®] VA 64 Fine recently obtained GRAS/SA status (Generally Recognized As Safe/Self-Affirmed) by the U.S. Food & Drug Administration (FDA) for use in food and nutritional supplements e.g. vitamin and mineral tablets.



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The Product

Influence of the particle size on the particle contacts



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Influence of the particle size on the particle contacts

For Kollidon[®] VA 64 Fine the particle size of a very efficient binder, Kollidon[®] VA 64, has been reduced substantially. This results in increased hardness of the finished tablets. Therefore the tablets show less friability and better mechanical stability.

Increased mechanical stability is helpful in many cases:

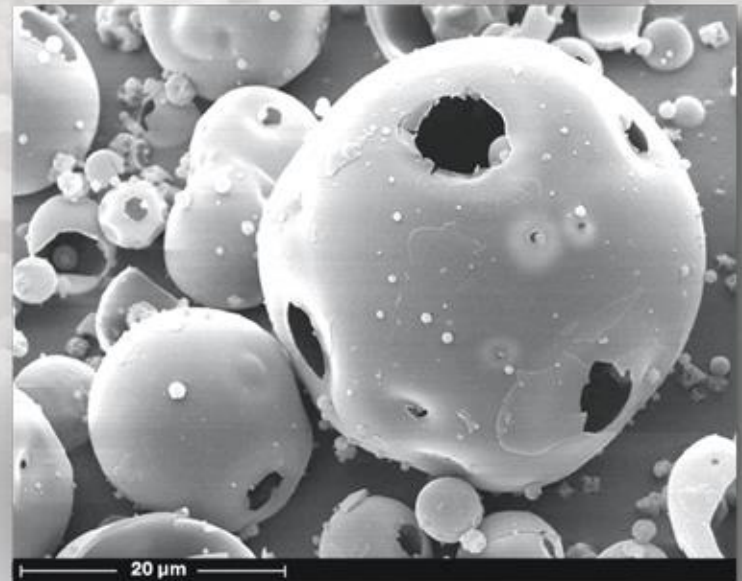
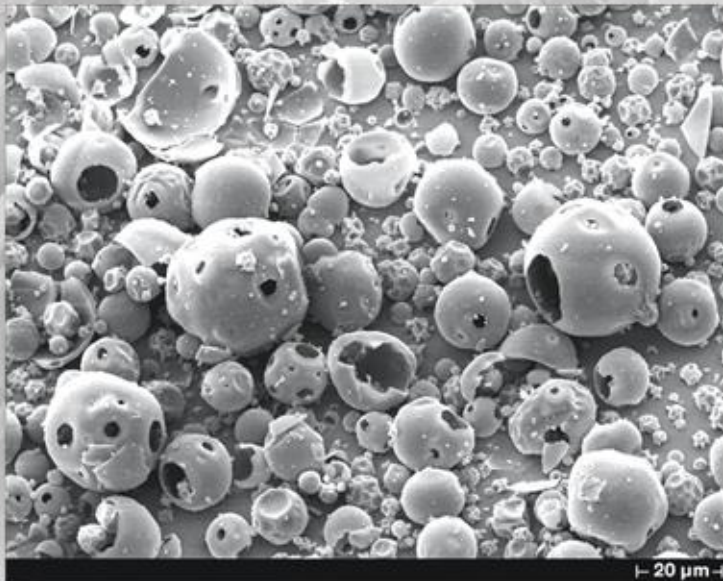
- Ability to be film coated – drum coaters apply mechanical stress to the tablets
- Trouble-free handling of the bulk tablets
- No problems during transportation



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The Product

SEM pictures of Kollidon® VA 64
Fine show a typical spray-dried powder with hollow spheres



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**Kollidon® VA 64 and Kollidon® VA 64 Fine:
excellent binders for granules and tablets.**



Due to their high plasticity, they produce tablets that are

- less susceptible to capping
- less brittle



Kollidon® VA 64 Fine is optimally suited for

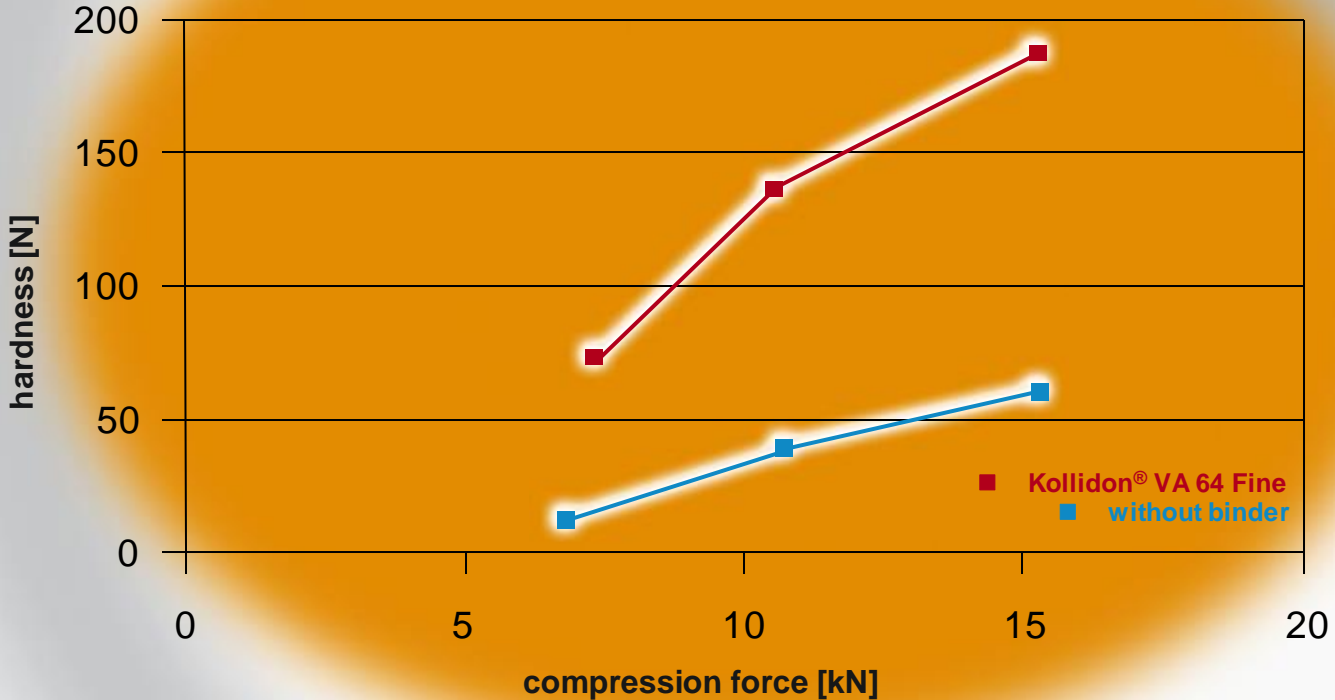
- many tablets of low hardness and high friability
- medium to high-dosed actives
- actives of low compressibility



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The Application

**Hardness/compression force profile of ASS tablets:
The binding effect is strictly concentration-dependent
since increasing binder amounts in the tablet lead to
a corresponding increase in hardness.**



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The Application

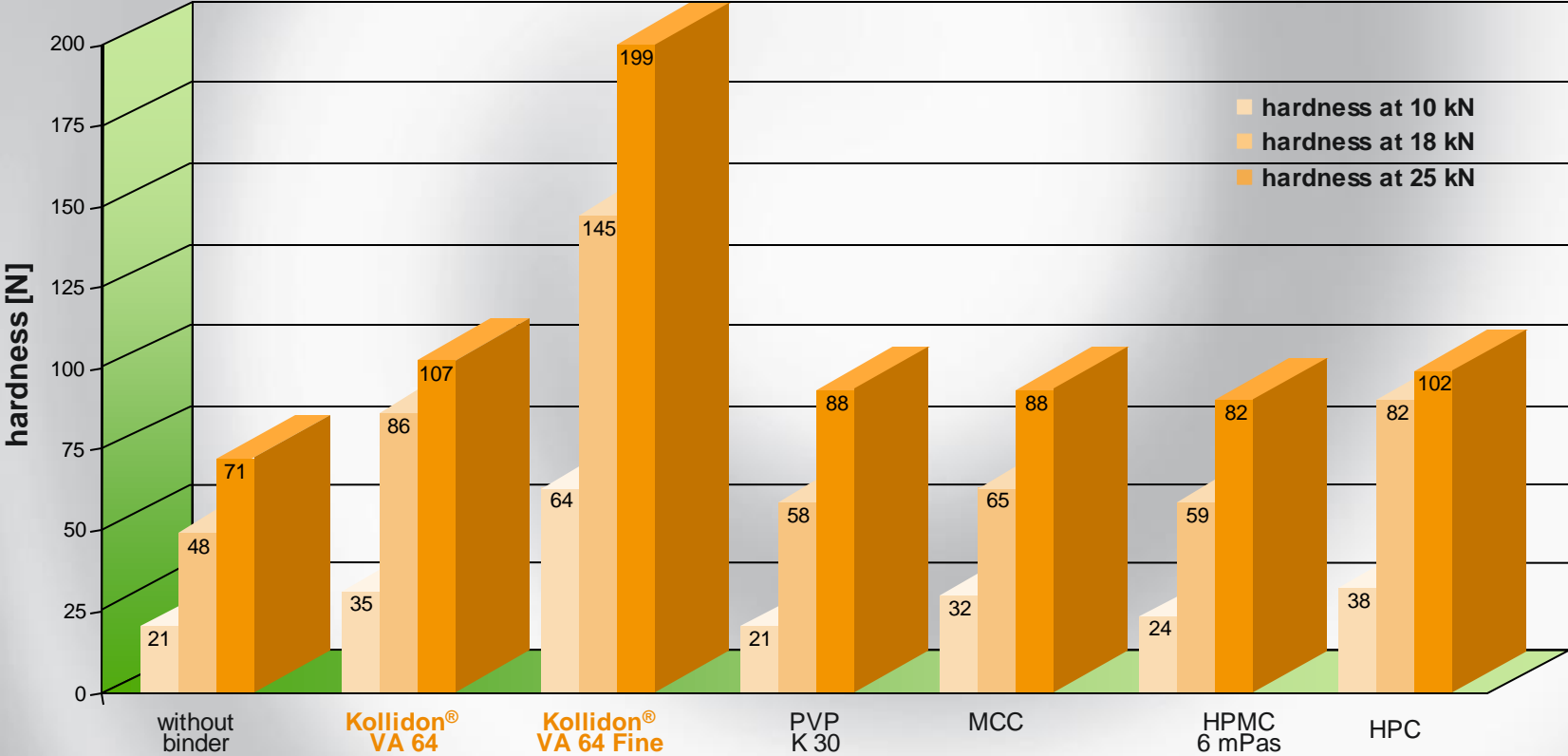
Schematic of a roller compaction process



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The Result

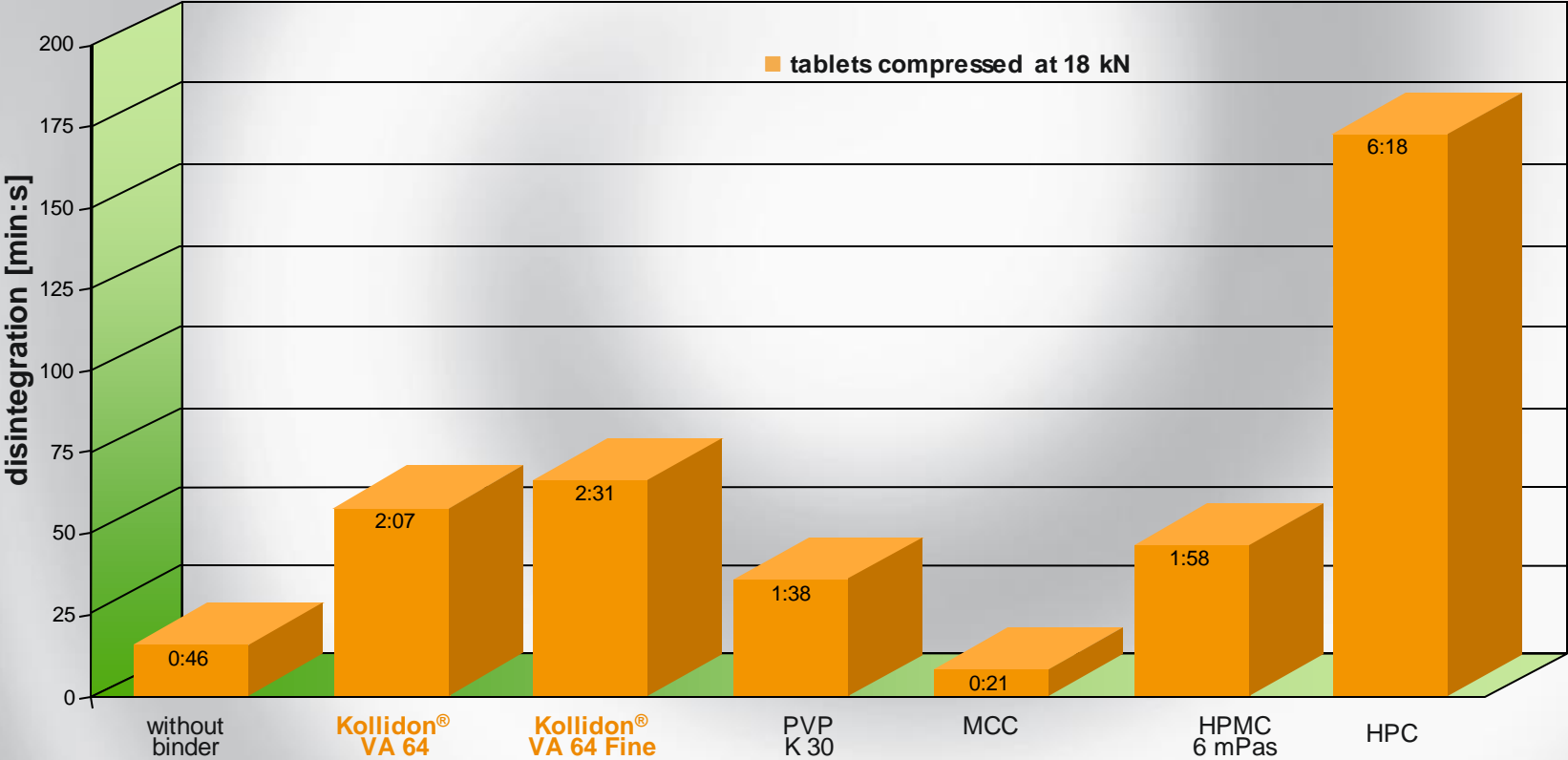
Kollidon® VA 64 Fine in comparison with competition products



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The Result

Kollidon® VA 64 Fine in comparison with competition products



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The Example

Direct compression: acetyl salicylic acid tablets
500 mg formulated with Kollidon® VA 64 Fine

Acetylsalicylic acid	500,0 mg
Avicel PH 102	200,0 mg
Kollidon® VA 64 Fine	60,0 mg
Kollidon® CL	25,0 mg
Magnesium stearate	3,0 mg
Total	788,0 mg

Sieving
Blending
Tabletting

Rotary press	Korsch PH 100/6
Punch diameter	12mm beveled edge
Speed	30 rpm

Equipment

Compression Force	6,8 kN	10,7 kN	16,5 kN
Tablet weight	772,3 mg	777,5 mg	768, mg
Hardness	81 N	140 N	187 N
Disintegration	04:13 min:sec	08:2 min:sec	15:0 min:sec
Friability	0,4 %	0,2 %	<0,1 %

Tablet properties



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Recommendations:

When disintegration times are influenced negatively a larger amount of disintegrant (e.g. Kollidon[®] CL) may be used.



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Properties of binders

Excipient	Binding effect	Effect on flowability	Effect on disintegration at comparable hardness
Kollidon® VA 64 Fine	++	No effect	No effect
Kollidon® VA 64	+	No effect	No effect
Kollidon® 30	+/-	No effect	No effect
HPC	+/-	Flowability decreased	Strong gelling effect
HPMC	-	Flowability decreased	Strong gelling effect
MCC	+/-	Flowability decreased	Good disintegration
Powdered cellulose	--	Poor flowability	Good disintegration

The table clearly shows that **Kollidon® VA 64 Fine is unrivaled in this respect.**



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Strengths of Kollidon® VA 64 Fine:

- Very good **plasticity** combined with **fine particle size** distribution produce very hard tablets.
- **Less Kollidon® VA 64 Fine is required** for the same hardness of the tablets.
- No strong negative influence on disintegration.
- No negative influence on the flowability of the finished powder formulation.
- Compliance with the current **monographs** for copovidone.

In short: The unrivaled dry binder Kollidon® VA 64 Fine makes for

- easier production processes
- economical optimization
- higher profit margins



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