Lempp, M.: „Die Strömungsverhältnisse von Gas-Feststoff-Gemischen in Verzweigungen pneumatischer Förderanlagen“ Aufbereitungstechnik No.7, 1966, pp 81 -91

“The tests carried out on T-shaped branch pieces have shown that the distribution of material is determined essentially by the ratio of the inertia forces to the resistance forces of the solid particles.

The distribution of material increases linearly with the air distribution, but not in the same ratio. When the forces of resistance prevail there results a proportional distribution of air and material.

If, however, the resistance forces, as compared with the inertia forces, can be neglected, the distribution of material becomes independent of the air distribution.

The distribution of the material to be conveyed depends on the volume concentration of the solids, on the ratio of the cross-sectional areas of branch pieces and feeding pipe and on the particle size of the material to be conveyed. The feeding velocity does, however, not play any important part. At high velocities it is all the same whether the conveying current is horizontally or vertically directed to the branch piece.

Within the range of low feeding velocities, a segregation of the material to be conveyed and air takes place in horizontal conveying ducts. The conditions of flow thereby become very obscure.

The pressure losses in branch pieces can be determined by calculation. The calculation shows that the pressure loss additionally effected by the material depends only on the ratio of the velocity of the material to be conveyed to that of the air when the friction is neglected which is permissible in many cases.”

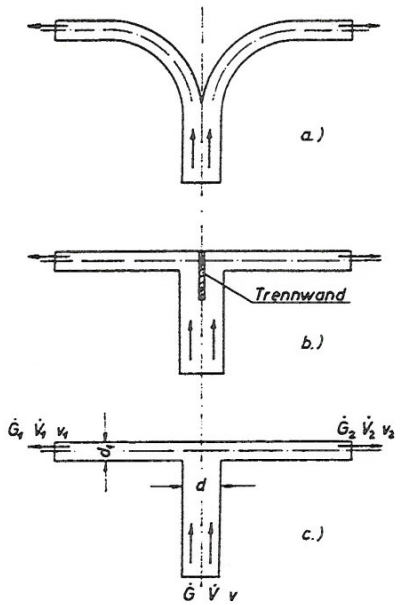

Bild 1: Verschiedene Verzweigungsformen
Various types of branch pieces
Différentes formes de ramifications

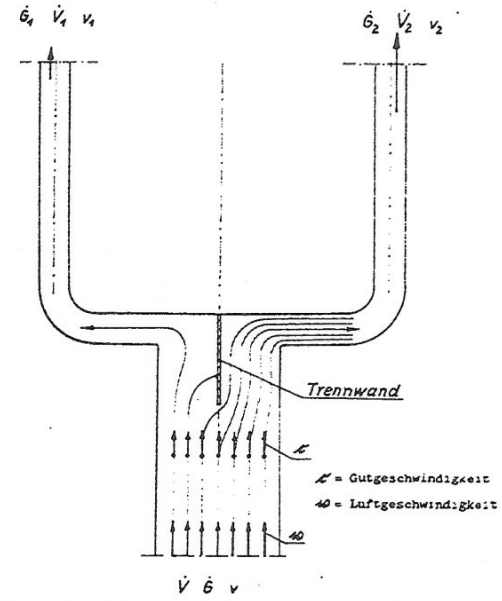

Bild 2: Stromlinienverlauf in einer Verzweigung mit Trennwand
Configuration of flow in a branching with partition wall
Tracé du flux dans une ramification avec cloison séparatrice

Symbol	⊙	⊡	△
Fördergut	Grieß	Grieß	Grieß
Zulauf	vertikal	vertikal	vertikal
Gutbeladung μ i. Zulauf	0,81	0,78	0,805
Luftgeschw. im Zulauf	14,6 m/s	7,3 m/s	11,1 m/s
Luftmenge im Zulauf	5,4 p/s	2,7 p/s	4,1 p/s
Gutmenge im Zulauf	4,37 p/s	2,1 p/s	3,3 p/s
Querschnittsverh. F_1/F	0,25	0,25	0,25

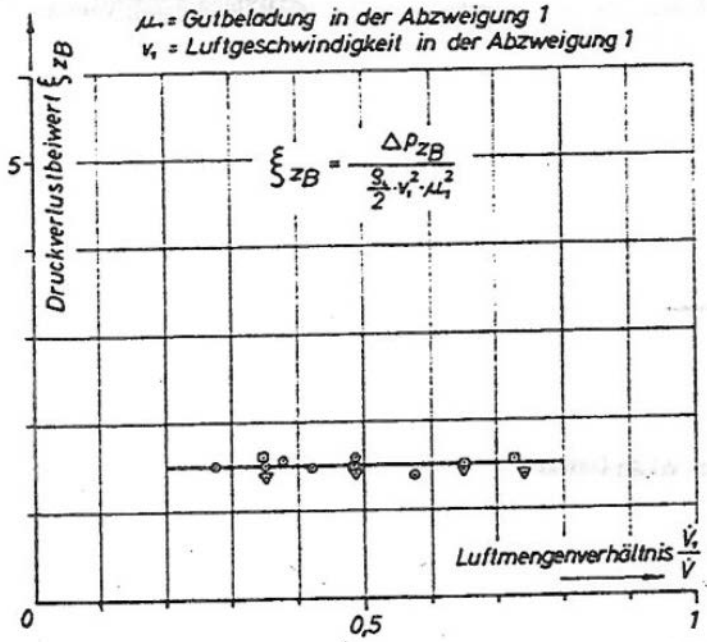

Bild 16: Druckverluste für verschiedene Zulaufgeschwindigkeiten bei konstanter Gutbeladung in Abhängigkeit vom Luftmengenverhältnis

Pressure losses for various feeding velocities at constant volume concentration of material as a function of the air volume ratio

Pertes de charge à différentes vitesses d'arrivée et proportion de matière constante, en fonction de la proportion quantitative d'air