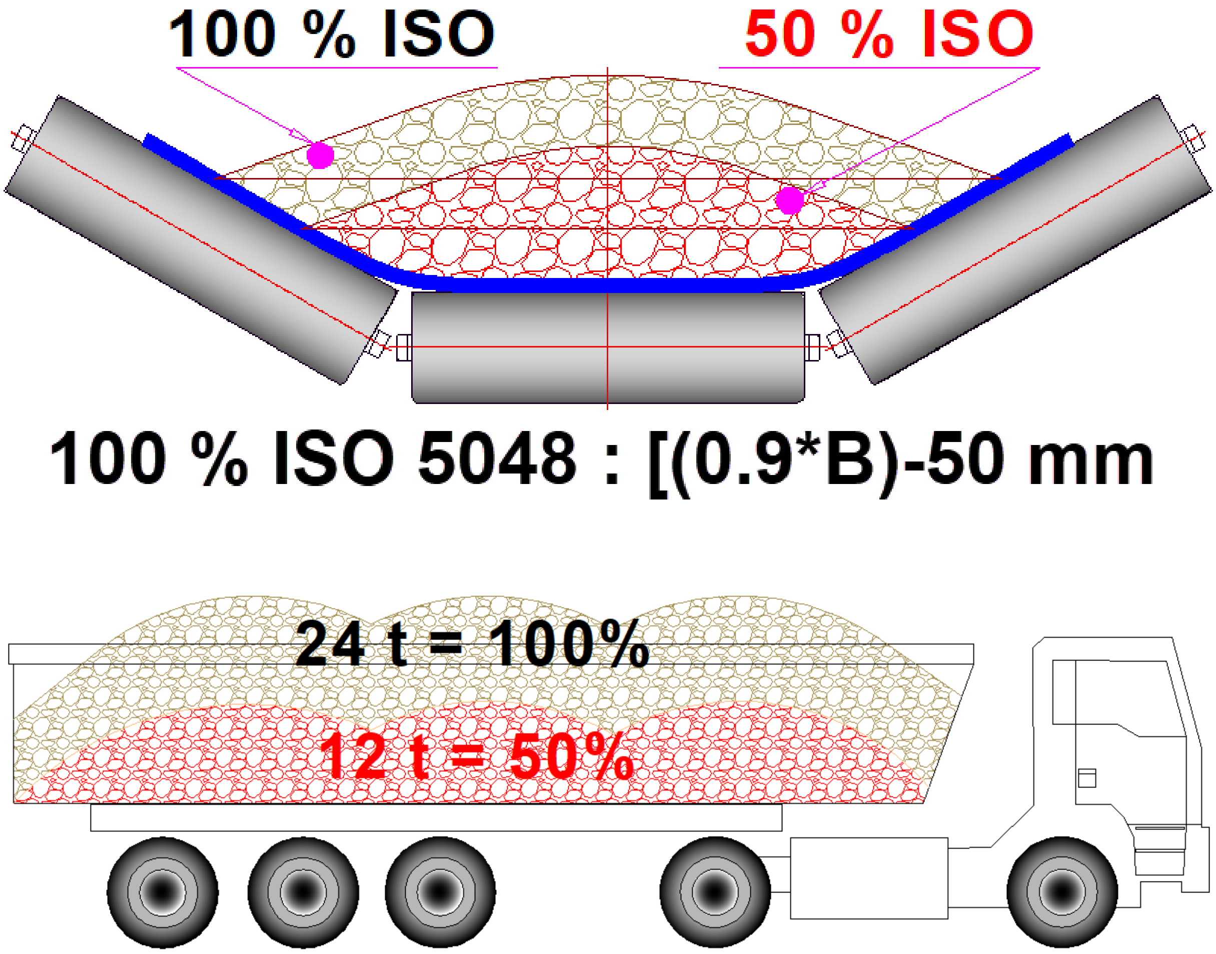

(IMAGE)

Calculation of conveyors (continued 1)

Optimization 1

The belt filling coefficient

In my article "*Calculation of conveyors*" published on 21-02-2020, I wrote "*must this calculation still comply with technical standards and good practice; which is less certain!* "

This article "**... continued 1**" tackling the 1st optimization to consider.

For the anecdote and to show the importance of the subject, I had to give a ruling on a conveyor project (weighfeeder) in which my recommendation was to reduce the belt speed in an order "**35**", i.e. a speed defined by the manufacturer of **1.05 m/s** (weighfeeder!?) for 10 t/h of iron ore, density 1.8, with a belt width 800 mm, in trough at 30°, all giving a filling coefficient of **2.6%;** when it would have required, at being generous, a belt speed of **0.03 m/s**, to painfully obtain a filling coefficient of **60%** according to ISO 5048 # 7.

Finally, the project was reviewed with a 400 mm wide belt, etc.

If this first example is rare, I observe that, very often, the belt filling coefficient is around **30% to 65%**.

If this situation is transposed to the field of truck transport, which operators would accept that their trucks, or those of their transport subcontractor, run as lightly loaded; there would be dismissal in the air or of breach of contract for abuse and fault.

The question:
What are the advantages of a conveyor design with a belt loaded at 85% -100%, by volume, of the coefficient defined by ISO 5048, compared to the same conveyor with a load coefficient of 50%, at output and other identical characteristics?

Here, the adjustment variable for **this optimization is the belt speed**.

Note that to find the right speed, must be considered the increasing the slope angle of the product on the belt. Indeed, between a slope angle of a product handled at 3.0 m/s and the same product on the same conveyor handled at 1.0 m/s, there is a chance that this angle will change from 10°-15° to 30°, with again more margin; this is all the more true if the design of the feed chute respects the rules of the art.

The balance sheet:
- Energy saved on moving the product (horizontally, vertically): 0 KW!
- Energy saved on the mechanical operation of the machine: it still exists and is very variable depending on the conveyor considered; often this saving is around 10%, but sometimes it can approach 30%, if long as the whole project is reconsidered.

But, let's stop talking about saving energy; let's act!

- Soiling, loss, soaring, broken product: the "benefit" is always, at a minimum, proportional to the reduction ratio of the belt speed
- Wear of components: same as above.
- There are other advantages, such as those linked to a projection of the product when passing the unloaded pulley (parabola of falling), but all these advantages are to be identified on a case-by-case basis, which this popularization article does not.

Note :
It seems important to me to reconsider designs based on builder standard components when this "standardization" becomes aberrant and counterproductive; all the more so when it comes to machines having a significant influence on the process, like the weighfeeder in my example.

If on your conveyors you notice a low coefficient of filling of the belts and you want to improve this point, C3 Expert is at your disposal via marc.desrieux@c3-expert.com