

# FILM in SPACER – Project description:

## A) PROJECT GOALS

1. Removing disadvantages of standard glazing and setting up new standard in the IG market
2. Decrease significantly the difference between insulating value of wall and window.
3. Put on IG market a product, which allows IG manufacturers to have long-time profit, and for customer (window producers and façade builders) to lower transport and manipulating costs.

## B) MAIN TOPIC:

1. **For Europe only (with production ratio Double- : Triple-glazing = 50:50):**  
Reducing 1/3 of weight allows in whole process (from initial components production to application of windows and facades) collect more saved money than is the price of triple-IG unit. And this with better performance (Ug, LT, G, Rw) than triple-glazing.
2. **For all other continents (with more than 80% production of double-gl.):**  
Increasing insulating value of double-glazing more than 50% (Ug: 0.9 → 0.3) + better acoustic attenuation + better PSI + less gas leakage + much more environmentally friendly without increasing initial production energy and all this without weight increasing, so by keeping all advantages of simple double-glazing.

## C) 6x MORE ENVIRONMENTALLY FRIENDLY THAN TRIPLE-GLAZING:

1. With each replaced 4mm glass by thin film is 20 kWh (=18kg CO<sub>2</sub>) of initial energy needed for its production saved.
2. Every IG unit (double or triple-glazing) with FILM in SPACER insulates 2x better than without it (extremely saving CO<sub>2</sub> production in buildings)
3. Significant saving of manipulating costs and fuel in comparing Double-glazing with FiS against Triple-glazing.
4. More day-light and solar gain due cheap anti-reflex coating on film (LT=96-98%): save energy for light and heating. (Anti-reflex surface on film requires no extra energy – online process)
5. Replacing standard double-glazing (24mm) in current window-frames by glazing with FILM in SPACER creates option of biggest, fastest and most effective form of energy (and CO<sub>2</sub>) savings in th World.
6. Acoustic problems do not have to be solved by more glass panes with lamination (more initial energy) anymore, alone combination glass with film reduces noise about 2-3 dB better than triple-glazing.

## D) WHAT DO WE GUARANTEE TO OUR CUSTOMERS

1. Reaching all promised properties of IG according to EN 1279-4 – both for bended and stacked spacer in corners.
2. Real possibility to produce IG with 2 or 3 chambers in double-glazing and with 3 or 4 chambers in triple-glazing and so reaching the properties published.
3. Max. size of IG with FiS is 1,5 x 2,3m for rectangle shapes. For solution with one film in spacer we intend to reach bigger size (1,6 x 2,5m). For even bigger sizes or not rectangle shapes the INTERM system is already available (*INTERM: film is fixed between two spacers and stretched by heat using shrinkage of the film*)
4. Immediate availability of all components (compatible spacer from more suppliers, adapter, films in more variants) necessary low-e glasses etc.
5. 3.- to 4.- Euro LESS material costs THAN FOR triple-IG-unit (*Saving: 1 spacer, 2 butyl strips, lower price of film than of glass*).
6. Lower production costs thanks the lower number of components and lower weight (*IG with FiS: 2 glasses + 1 spacer with integrated film against triple-IG with 5 components: 3 glasses + 2 spacers*)
7. **In first stage (2017/2018)** will be ready device, what integrates and stretches the film in spacer (*placing the spacer with film on glass by hand, assembly in press, gas filling through rivets*) + upgrade butyl machine + upgrade desiccant filling machine  
**In second stage (2018/2019)** together with producers of IG technologies will be solved fully automatic assembly of IG and gas filling in press (with new production line).
8. Availability of the first technology in 2017/2018 for a price depending on size, type of spacer (*bended, stacked in corners*), number of films (*1 or 2 integrated in one spacer*) and automation level, 500,000 – 1,000,000 Eur.
9. Full technical support for product and production technology, existence of software for calculating and design of IG units and its statics, additional software for modelling properties of IG with film inside

## E) SUPPORT IMMEDIATELY

Samples for marketing and for testing, advertising materials, seminars, advertising articles, and mainly seeing the first commercial manufacturing technology in CZ (2017)