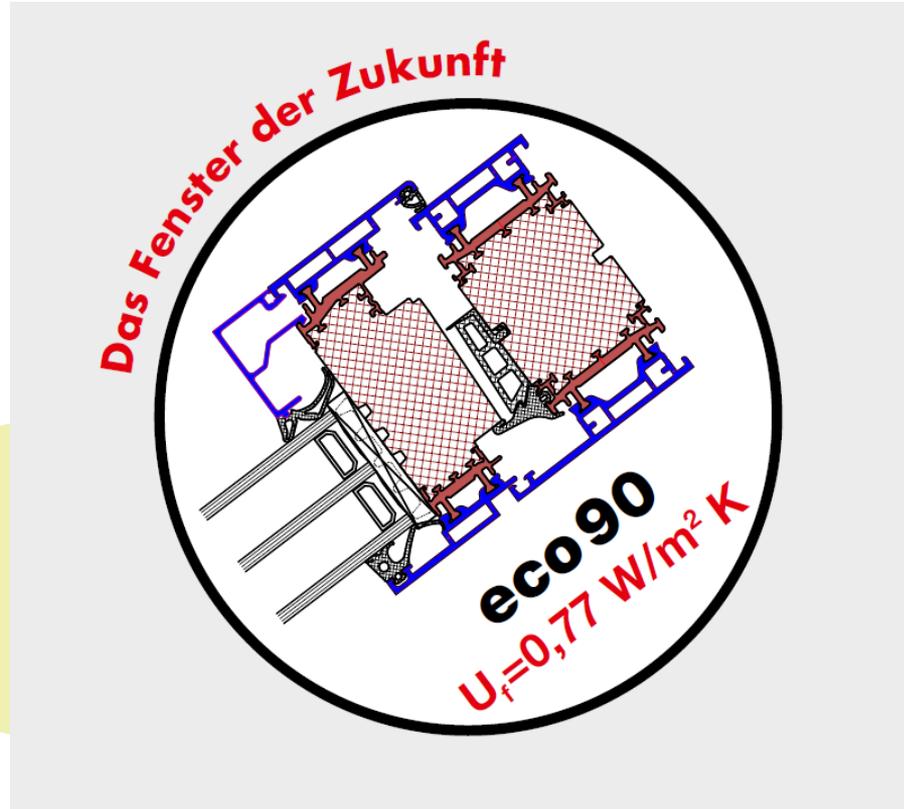




PURAL

Highly thermally insulation Profile - Systems of aluminium for **Windows** and **Doors**



The new High – End Window System for Today and the Future



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In Total Europe we have a fixed Energy Roadmap 2050 to reach the CO₂ Goal ...but could we reach the Goal if we´ll work in the Way we do in this Moment ?



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The Answer is very easy ...
we could not reach the Goal...

We plan and build new Buildings and Renovation Buildings not in the right Way - what is technical possible and affordable - We plan and build on the lowest Level we have to do from the Law ...

But the Buildings we plan and build in this Moment need the same Energy in 20 Years as Today and Quality Window has a Lifetime from about 30 or 40 Years.

And so if we want to reach the Goal in Energy Efficiency we have to do the best we could do in this Moment.



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To reach the Goal **PURAL – Profiles** started in 2010 to create an Aluminium - Windowsystem in Passivhouse Standard and we want to create the Windowsystem in a Way that it is affordable for every Investor if he want to do it in the best Way and not in the cheapest Way.

Our New Systems:

Pural Eco 90 with a U_f – Value from $0,77W/m^2k$ in Passivhouse – Standard

Pural Eco 75 with a U_f – Value from $1,1 W/m^2k$ in a low Energie Standard

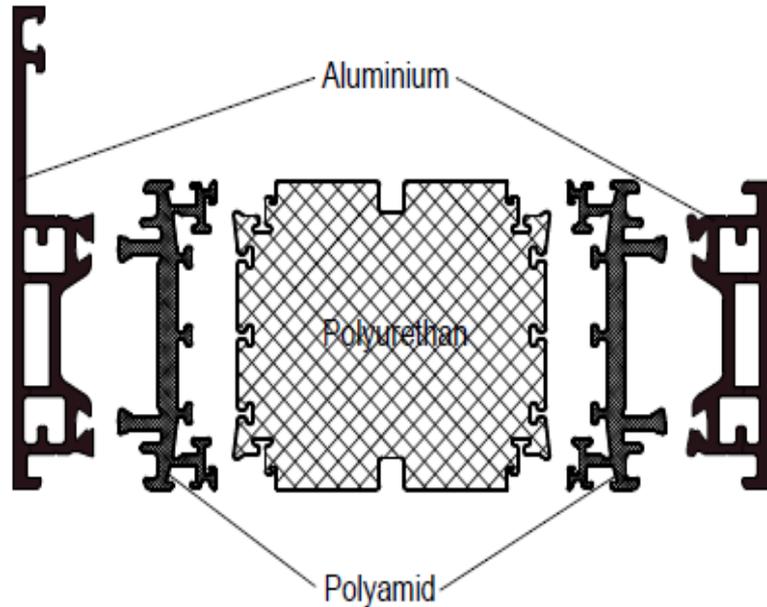


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To reach our Goal - we have to create a Window that is easy and fast to Build in every Window Factory around the World. Without Specialmaschinen and without spending much Money in the factory.

Our Result you can see on the left Side. We produce the Isolation Block in Polyurethan in the combination with 2 Polyamid Profiles.

You only need a few Sealing, a Hingis and Glas and 1 Hour Time and the Passivhouse Window is ready to save CO₂ and money for the next 40 Years.

That's our way to reach the Goal !



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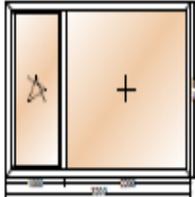
U-Wert Protokoll

Bearbeiter: Hauptnutzer

Seite: 1
 Datum: 31.10.2013
 Uhrzeit: 13:51
 Projekt: Präsentation

Pos 1

1 Stück Fensterelement 3200 mm x 2100 mm Fensterelement 3200 x 2100 MM, bestehend aus einem Festfeld und einem DK-Fenster.



Maßstab 1:100

Außenansicht

System: Pural ECO90 Dichtung außen 9mm

Bereich	Fläche/Länge	U-Wert
Profile (U _f)	1.398 m ²	0,76 W/(m ² K)
Glas (U _g)	5.322 m ²	0,50 W/(m ² K)
Randverbund Glas (Psi)	13.100 m	0,035 W/(m K)
Gesamt (U _w)	6.720 m ²	0,64 W/(m ² K)

This sample will show a optimized Window in **Pural Eco 90** with Passivhouse Standart.

The way we have to build in the Future. And the Best U-Value you could get in the Moment.

In this Sample you have a good U-Value in the Frame and in the Glas with a good Spacer in the Glas. A Bad Spacer will destroy the U-Value of the hole Window !

The Material Price is lower than 100 € per Square Meter !



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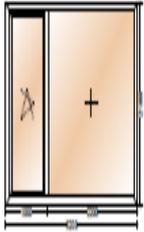


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Pos 2

1 Stück Fensterelement 3200 mm x 2100 mm Fensterelement 3200 x 2100 MM Eco75, bestehend aus einem Festfeld und einem DK-Fenster.



Maßstab 1:100

Außenansicht

System: Pural ECO75 Dichtung außen 9 mm

Bereich	Fläche/Länge	U-Wert
Profile (U_f)	1.398 m ²	1,1 W/(m ² K)
Glas (U_g)	5.322 m ²	0,50 W/(m ² K)
Randverbund Glas (Psi)	13.100 m	0,035 W/(m K)
Gesamt (U_w)	6.720 m ²	0,70 W/(m ² K)

Summe aller Positionen (U_w)	13.440 m ²	0,67 W/(m ² K)
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Die Wärmedurchgangskoeffizienten U_w wurden für Einfachfenster nach EN ISO 10077-1:2006 + AC:2009 bestimmt. Hinweis: U_w Kerne! VO.9

This sample will show a optimized Window in **Pural Eco 75** with Low Energie Standart and an U_f Value 1,1 W/m²k.

This Window in Kombination with a good Glas and a good Spacer is a possible Window Konstruktion for the Future but it is not the best Konstruktion. In this Sample you have a good Glas with low Temperature losses in the Glas but the Frame has lower Temperatures as a Eco 90 Frame and you lose more Energie in the Part of the Frame.

The Material Costs per Square Meter are 90 € only a short Different to Pural Eco 90 !



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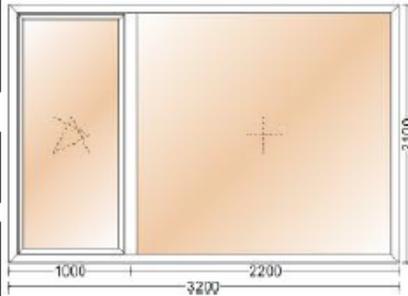
2-tlg. Fensterelement

EnEV - Uw-Berechnung nach DIN EN ISO 10077-1

Maße:	B:	3200 mm
	H:	2100 mm

Gesamtfläche:	6,720 m ²
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System:	Standard Profile
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Profilkombination:	U _f :	Fläche:	Wärmeverlust:
	1,4 W/(m ² K)	1,161 m ²	1,625 W/K=(20,87 %)
		1,161 m ² = 17,28%	1,625 W/K=(20,87 %)
Glas:	U _g : 1,0 W/(m ² K)	5,559 m ² = 82,72%	5,559 W/K=(71,38 %)

Glasrandverbund:	ψ _g :	Länge:	
	0,045 W/(mK)	13,400 m	0,603 W/K=(7,74 %)

Summe	7,7874	W/K=(100 %)
-------	--------	--------------

U_w : 1,16 W/(m²K)

And now

...the normal way in Building and Renovation in Europe

But it's the wrong way to reach the Goal ...

2 Layers Glas and a Frame with a Standard U - Value are not the Way to build and renovate in Europe to reach the Goal...

It is not enough.



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In this Moment we build Windows with good tempered Glas to reach the U_w Value but the most Window Frames are bad tempered with an U_f Value between 1,3 and 1,8 W/m^2K and only the Glas make it possible. But this is the reason that we have warm Glas and a cold Frame and around the Window we lose the energy and get Problems with condensation on the Frame and on the Wall near the Frame. So it is Important that we do our best and the best way is a Glas with an U_g Value not lower than 0,2 W/m^2k than the Frame in combination with a good Value in the Spacer. Than we don't lose energy and we have the same Temperature around the Window and not in Parts of the Window !



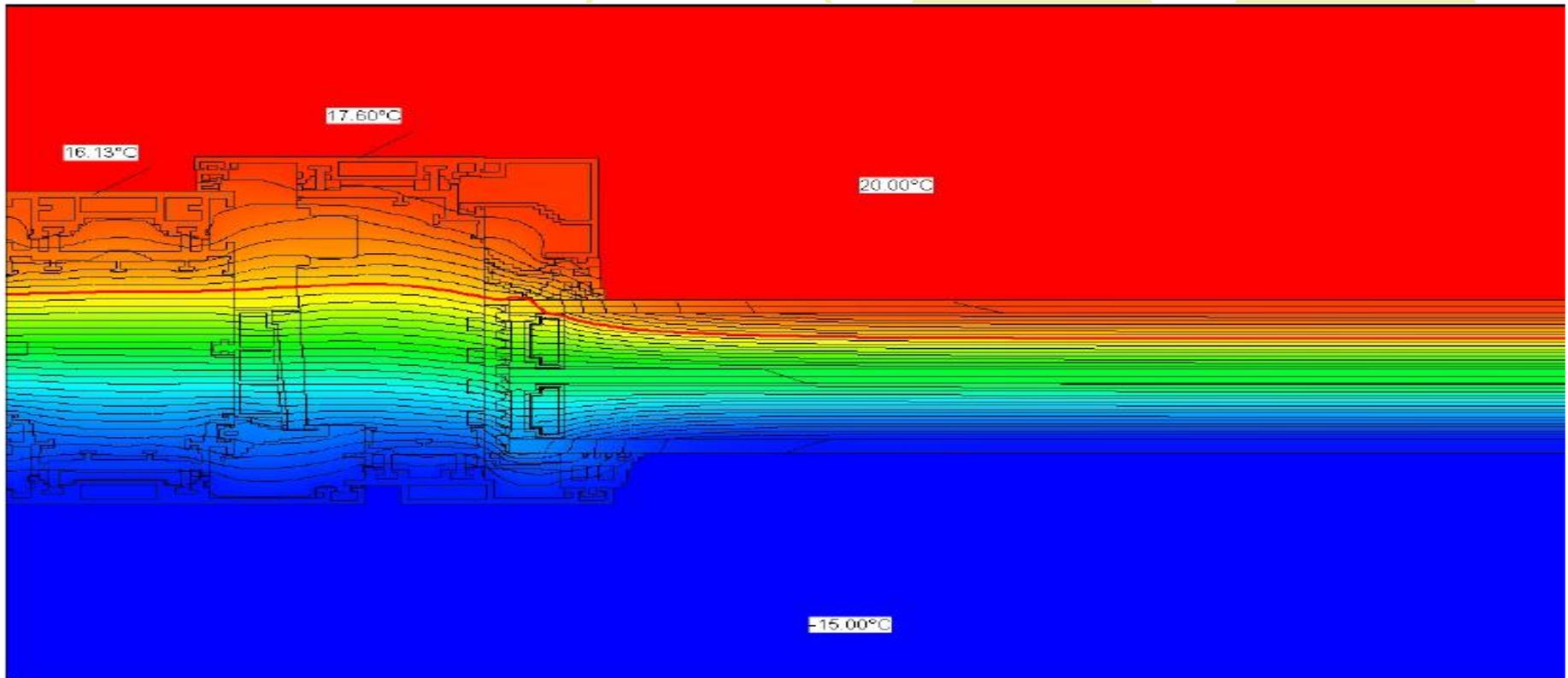
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Isothermenverlauf Pural Eco 90



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But the Way is easy to reach the Goal, today we have to spend a little more money for Energy Efficiency but tomorrow we start to save money and we start in a clean Future for us, our Children and our Planet.



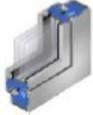
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PURAL GmbH & Co. KG
Ziegeleistraße 11
D-64560 Riedstadt-Erfelden



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Energiekosteneinsparung

U _w -alt :	1,30 W/m²K
U _w -neu :	0,6 W/m²K
Fensterfläche :	3000 m²
Energiequelle :	Heizöl
Energiekosten :	0,80 EUR / L
Preisentwicklung / Jahr :	10 %
Berechnungszeitraum :	15 Jahre
Heizgradtagzahl :	3600 K x Tag
Wirkungsgrad :	75%

Kostenersparnis : 507.454 EUR

typische Werte für U _w -alt :	Einfachverglasung :	4,5 W/m²K
	Isolierverglasung :	3 W/m²K

Die Ergebnisse stellen lediglich Näherungswerte dar und können nicht alle Variablen berücksichtigen. Daher hatten wir nicht für eventuell auftretende Fehler.

We calculate the money you can save if you build with Energie – Efficiency, in our Sample you see an old U_w – Value 1,3 W/m²k

For the Past it is a very good Value, but after change the Windows in this bigger School we could save in 15 Years more than 500.000 € in Energy for the Investor and Million Tons CO₂ for our Planet.

But the Reality is different from this Sample, in the Moment we change Windows more than 30 or 40 Years old with U_w – Values between 3,0 and 4,5 W/m²k. You see....it's possible to save much more money and CO₂ than we have in our Sample.



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Rigid polyurethane foam and environment, ecological aspects

In the „Life-cycle-analysis“ a product is regarded "from the cradle to the grave". Applying this to PUR-Hard foam the criteria energy input, energy conservation and pollutant releases crucial in the three phases of a product: manufacturing, utilization and recycling.

Production

Crude oil or renewable resources such as sugar beets, maize, potatoes and recently also recyclates from synthetics are usually the raw material base in the production of rigid polyurethane foam insulants. Here from the two main components polyol and isocyanate are manufactured. In the case of rigid PU foam crude oil is not burnt for heating purposes, but used to manufacture an insulant, helping to save energy over the course of 30 to 50 years. Nowadays, water is used as a propellant, which produces CO₂ as an encased cell gas during the chemical reaction with isocyanate.





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Health criteria

Rigid PU foam produced following regulations doesn't give off any physiological relevant amounts of chemical substances, esp. formaldehyde dispense hasn't been observed.

Recycling

Rigid PU foam could be recycled. Nowadays adhesive hard board can be made from process waste. Some manufacturers use waste also to make recyclate polyols by means of glycolysis, which are directly used again in manufacturing. PUR hard foam waste that can't be recycled is put in household waste combustors for thermal recycling.



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Handicap House Tarstrup / Kopenhagen

General Constructor:
NCC – Construction

Metal Construction
Aholm und Christensen

More than
4000 m² Fassade



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School Building in Hamm/Germany build and renovated as a Passivhouse

Owner : Town Hamm

Contractor: Jansen Metallbau Heinsberg

Passivhouse more than 1000 m² Windows



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Office Building in Oberhausen /Germany

Build by an Private Investor

Contractor: Kramer Metallbau / Oberhausen



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Renovation

Old DDR School Building Renovated with Low Energie Windows

Owner: Town Döbeln

Contractor: Nehring Metallbau



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Office Building Copenhagen

Build as a Green Building with more than 2000 m² Windows

Owner : NCC Construction

Metall Contractor:

ESI/Germany and

Husmer Frederiksund /
Dänemark

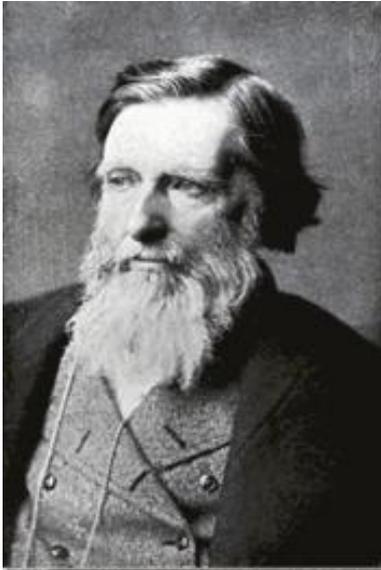


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“It's unwise to pay too much, but it's worse to pay too little. When you pay too much, you lose a little money - that's all.

When you pay too little, you sometimes lose everything, because the thing you bought was incapable of doing the thing it was bought to do.

The common law of business balance prohibits paying a little and getting a lot - it can't be done. If you deal with the lowest bidder, it is well to add something for the risk you run, and if you do that you will have enough to pay for something better.”

John Ruskin



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of aluminium for **Windows** and **Doors**

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