



SOLAR PROGRAM CATALOG

*SUBSTRUCTURES FOR MOUNTING SOLAR
PHOTOCOLTAIC POWER PLANTS*







With great pleasure that the company NIKA KONSTRUKCIJE d.o.o. with the NIKA SOLAR program has become a recognized manufacturer of structures the assembly of solar photovoltaic power plants in Croatia and beyond. From the time it was released on the market at the beginning of September 2012 until today, structures from the NIKA SOLAR program have been installed in many small and large power plants throughout Croatia. The total installed capacity of the solar power plants in which we participated in the construction exceeds 15Mwp!

In a period of one year, all elements were arranged and improved from defining the solution (defining calculations, tips,..) to production to production (increase in productivity), and today we can talk about production capacity - the several MW per month, and very fast and efficient distribution throughout Croatia. Every done was accompanied by continuous cooperation with contractors, accepting suggestions and improving the offered solutions.

I would like to take this opportunity to thank all business partners who have recognized us as a relevant and reliable partner, and I hope that in the coming period the cooperation will expand to mutual satisfaction.

Best regards,
Zvonko Kišić
Goran Kovačić

TABLE OF CONTENTS

Construction solutions for photovoltaic solar	5
---	---

Expected lifetime of construction elements of NIKA-SOLAR®	5
---	---

OVERVIEW OF COMPONENTS for substructures for solar power plants	6-12
---	------

SOLUTION OVERVIEW Pitched roof (roofing tile, shingles...) – single supports	13
---	----

SOLUTION OVERVIEW Pitched roof (roofing tile, shingles...) – double supports	14
---	----

SOLUTION OVERVIEW Pitched roof (trapezoidal sheet) – single and double supports	15 - 16
---	---------

SOLUTION OVERVIEW Flat roof – flexible solution for optimizing productivity	17
--	----

SOLUTION OVERVIEW System for montage on roofs at an angle covered with a trapezoidal sheet	18-19
---	-------

Specification of the roof hook	20
--------------------------------	----

Technical characteristics of the basic supports	21
---	----

CONSTRUCTION SOLUTIONS FOR PHOTOVOLTAIC SOLAR

With the goal of optimal use of roof surfaces, such as those in industrial halls, the construction of solar photovoltaic power plants requires adaptive solutions for the assembly of photovoltaic modules of solar power plants, i.e. the construction for mounting photovoltaic modules must be adapted to existing structures. In order to fulfill such requirements, the company NIKA-KONSTRUKCIJE d.o.o. offers construction solutions for mounting photovoltaic modules of solar power plants that represent optimum utilization of the available surface, easy handling, safety and prices.

NIKA-SOLAR® solutions are adapted to accept the majority of commercially available photovoltaic modules in various versions of the roof surface. The flexibility of NIKA-SOLAR® solutions enables optimal use of roof surfaces in all situations regardless of the roof surface.

NIKA-SOLAR® solutions for mounting photovoltaic solar power plants on the ground are defined taking into account unfavorable conditions related to variable loads relevant to the territory of Croatia (i.e. high wind speeds in the coastal area) and unfavorable atmospheric conditions (salty atmosphere). In this context, solutions are defined that can handle even the most difficult requirements, and each case is carefully analyzed in order to define the optimal solution.

NIKA-SOLAR® solutions are characterized by simple assembly in a few steps. Pre-assembled construction elements simplify assembly and reduce the required assembly time. An additional feature of the NIKA-SOLAR® solution is that it consists of a small number of different constructional elements, which allows optimizing the mass of the structure for mounting photovoltaic modules of solar power plants under conditions of variable loads caused by example with wind and/or snow.

NIKA-KONSTRUKCIJE d.o.o., as part of the NIKA-SOLAR® solution offers customers services in order to minimize the costs of building photovoltaic power plants and to meet set deadlines. The services include consulting services in the planning and/or design phase, as well as instructions related to the assembly itself.

EXPECTED LIFETIME OF NIKA-SOLAR® CONSTRUCTION ELEMENTS

The lifetime of photovoltaic solar power is, as a rule, it is 25 years or more. In accordance with these expectations, requirements are placed on the elements of the photovoltaic solar power plant regarding the stability of the material exposed to various atmospheric influences and variable loads.

Construction elements of the NIKA-SOLAR solution are made of aluminum and stainless steel due to corrosion resistance. In the case of structures for mounting photovoltaic solar power plants on the ground, the structural elements are made of structural steel, and corrosion protection is carried out by hot-dip galvanizing.

This choice of materials guarantees the stability of material with regard to corrosion throughout the expected lifetime of photovoltaic solar power plants exposed to atmospheric conditions defined by corrosion category C2 and C3.





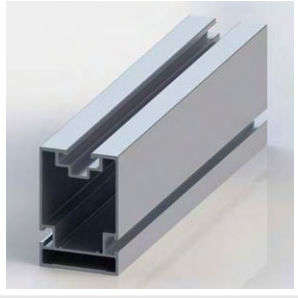
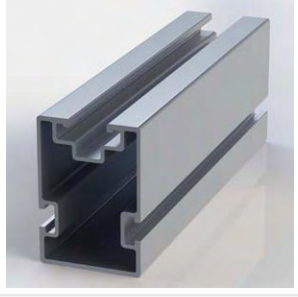
In the case of exposure of the construction elements to a salty atmosphere (corrosion category C4), in order to meet the requirements regarding the life span of screw elements made of stainless steel, it is necessary to use steel class V4A. In this context, the use of AlMg0,7Si, AlSiMg, AlSiMgMn i AlMgSi does not pose a problem, made of aluminum alloys and construction elements made of stainless steel).

Despite the appearance of corrosion in the mentioned places, the resulting corrosion will not, apart from visual changes, cause a significant weakening of the structure and damage its integrity.

For construction elements made of structural steel with corrosion protection performed by hot-dip galvanizing when used in a salty atmosphere (corrosion category C4), it is recommended that the construction elements be additionally protected by painting according to the recommendation of the manufacturer of the corrosion protection system.

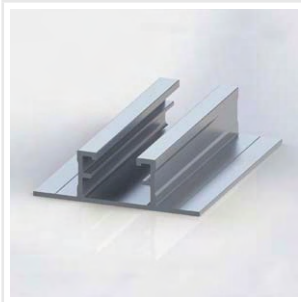



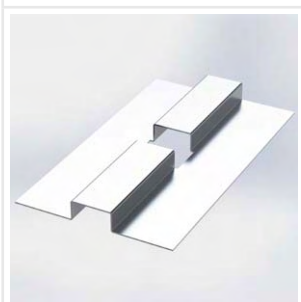

COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	3NS1-6,3 m	<i>NS-0001 36 x 45 mm (L=6300mm)</i>
	3NS1-5,4 m	<i>Carrier NS-0001 36 x 45 mm (L=5400mm)</i>
	3NS1-3,15 m	<i>Carrier NS-0001 36 x 45 mm (L=3150mm)</i>
	3NS2-6,2 m	<i>Carrier 36 x 60 mm (L=6200mm)</i>
	3NS2-6,2 m	<i>Carrier NS0003-1 60 x 90 mm (L=6200mm)</i>
	3NS3-3-6,2 m	<i>Carrier NS0003-1 50 x 72 mm (L=6200mm)</i>







COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	3NS4-6,2m <i>Carrier NS-004 for mounting on a trapezoid sheet cover (L=6200mm)</i>	
	3NS-SP-04 <i>Rail for connecting the carrier NS0004</i>	
	3NS - SP-01 <i>Rail for connecting the base carrier NS0001</i>	
	3NS - FR-90mm <i>Triangular carrier for raising the angle 10° Application for flat roofs with a width of 90mm</i>	
	3NSBAL <i>For concrete cube dimensions 300/400/500 mm A 6060 T6</i>	
	3GUMAMINI <i>Rubber base 90x30 mm za podkonstrukciju MINI</i>	




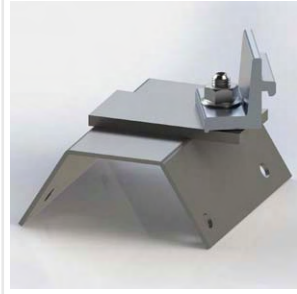

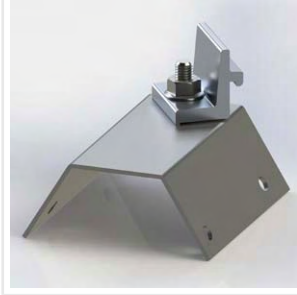
COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	<p>3GUMA <i>Rubber base 100x100mm for carrier NS0004</i></p>	
	<p>3NS-T-X-DEG <i>Carrier for lifting the module at an optimal angle (length 1180 and 1450 mm, slope according to the customer's specification)</i></p>	
	<p>3K-F-F <i>Adjustable stainless steel hook to hold carrier cover bracket</i></p>	
	<p>3KKK <i>Adjustable stainless steel hook for holding the carrier A cover made of a pile of ducts</i></p>	
	<p>3K-BC <i>Stainless steel hook for pepper cover</i></p>	
	<p>3HVM12x250 3HVM12x300 3HVM12x350 <i>HHangar screw for wood with a plate for holding the base carrier, sheet metal cover imitation of files, shingles</i></p>	







COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	<p>HANGAR VIJAK DUPLI 3DHVM12X250 3DHVM12X300 3DHVM12X350</p>	<p><i>Hangar screw for wood with a plate for holding the base support. Cover imitation of tiles, shingles. Optional threaded rod M12-M16, installation in concrete with chemical filling.</i></p>
	<p>3NSFALC</p>	<p><i>Stainless steel clip for corrugated sheet metal cover with support for base support</i></p>
	<p>3NSCINK</p>	<p><i>Stainless steel clip for clamping to a tubular steel constraction with a holder for the base support</i></p>
	<p>3NS-TS-SV</p>	<p><i>Stainless steel trapezoidal shoe for mounting the bracket on the trapezoidal sheet cover – TYPE 1.</i></p> <p><i>Material – stainless steel, EPDM, A 6060 T6.</i></p>
	<p>3NS-TS-SV-2</p>	<p><i>Stainless steel trapezoidal shoe for mounting the bracket on the trapezoidal sheet cover – TYPE 2.</i></p> <p><i>Material – Stainless steel, EPDM, A 6060 T6.</i></p>
	<p>3NS-TS-SH</p>	<p><i>Stainless steel trapezoidal shoe for mounting the bracket on the cover of the bracket on the trapezoidal sheet cover – TYPE 3.</i></p> <p><i>Material – Stainless steel, EPDM, A 6060 T6.</i></p>

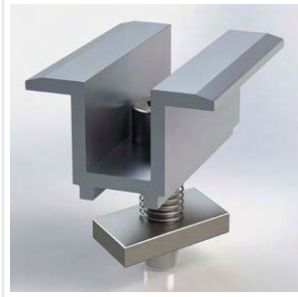



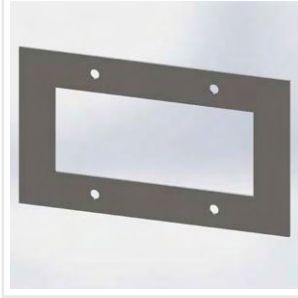

COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	3NS-TS-HALF <i>Element for attachment to a trapezoidal sheet with support NS 0001 cut to size according to the distance between the waves of the trapezoidal sheet.</i>	
	3NS0005-KC <i>Middle support of the module with a clamp for mounting on a square tube Production according to the pipe dimensions of the structure</i>	
	3NS0006-KC <i>End support of the module with a clamp for mounting on a square tube Production according to the pipe dimensions of the structure</i>	
	3NS0005-OC <i>Middle module holder with a clamp for winding on a round hose Production according to the diameter of the construction pipe</i>	
	3NS0006-OC <i>End support of the module with a clamp for winding on a round pipe</i>	
	3NS-0008 <i>Element for interconnecting supports NS0001 Application in cross constructions</i>	





COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	<p>3NS-0005 Middle element for receiving modules Material – aluminum Nut, spring and stainless steel screw</p>	
	<p>3NS-0006 End element for receiving the module Material – aluminum Nut, spring and stainless steel screw</p>	
	<p>3NSBAL-L Ballast carrier for concrete blocks in a row</p>	
	<p>3SPALŽICU Element for receiving the diameter aluminum wire of 8mm</p>	
	<p>3PLOČZAUZEM Module grounding plate</p>	
	<p>3VJETROLI760 Windshield for closing the back of the substructure on flat roofs with NS-FR triangular supports. Production according to module dimensions</p>	

COMPONENT OVERVIEW

SUBSTRUCTURES FOR SOLAR POWER PLANTS

	Naziv	Opis
	3NS-4/NS-1 <i>Element for lifting the base support NS-0004 on NS-0001</i>	
	3FNVL <i>Fine thread sheet metal screw made of stainless steel with bimetallic head and EPDM rubber</i>	
	3VIJDRVO <i>Stainless steel wood screw used to attach all types of hooks to wood construction</i>	
	3HVSTEELM10x50 <i>Hangar hook made of stainless steel for mounting on steel constructions with support for the base support</i>	

SOLUTION OVERVIEW

SLOPED ROOF(tiles, shingles...) – SINGLE SUPPORTS

A simple system consisting of several pre-assembled components for easy and quick assembly. Suitable for roof surfaces in regions with lower values of reference loads from snow and wind (the applicability of the solution is subject to verification by experts). Thanks to the high-quality materials and the structural compatibility of the construction element, a long service life and reliability are guaranteed.

ADVANTAGES

Single installation

–the system consists of a small number of pre-assembled structural elements

Flexible solution

–system elements dimensioned for different types of cover (e.g.hooks with the possibility of adjustment at the installation site)

Corrosion resistance

–construction elements made of quality materials (aluminum and stainless steel)

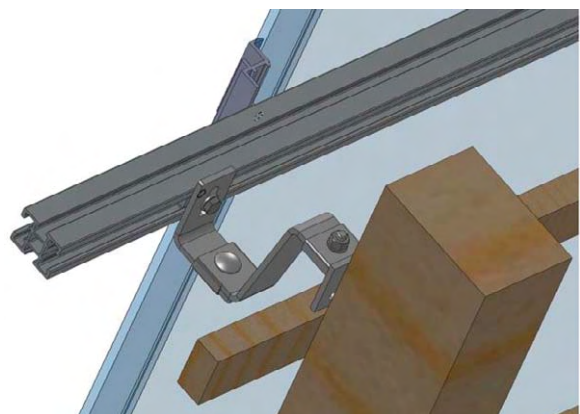
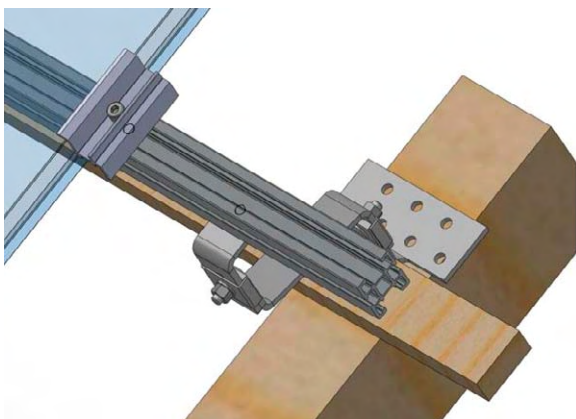
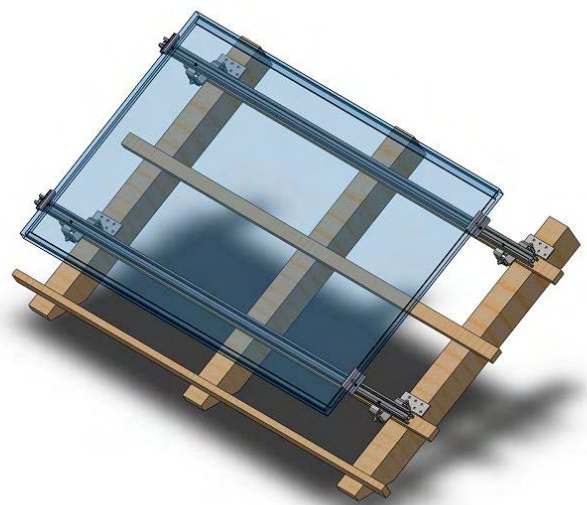
Support

–software package for easy selection of the optimal combination of structural elements with regard to the defined installation conditions

Simple assembly of photovoltaic modules using pre-assembled elements.

Insertion of pre-assembled elements in any place of the longitudinal support.

Installation of longitudinal supports using one screw and the associated clamping plate. Adjusting the position of the longitudinal support in the transverse direction and the distance from the roof surface.



SOLUTION OVERVIEW

SLOPED ROOF(tiles, shingles...) – DOUBLE SUPPORTS

A simple system consisting of several pre-assembled components for easy and quick assembly. Suitable for roof surfaces in regions with higher values of reference load from snow and wind. Applicability of solutions subject to verification by experts.

Thanks to high-quality materials and the structural compatibility of the construction element guarantees a long service life and reliability.

ADVANTAGES

Simple assembly - the system consists of a small number of pre-assembled structural elements

Flexible solution

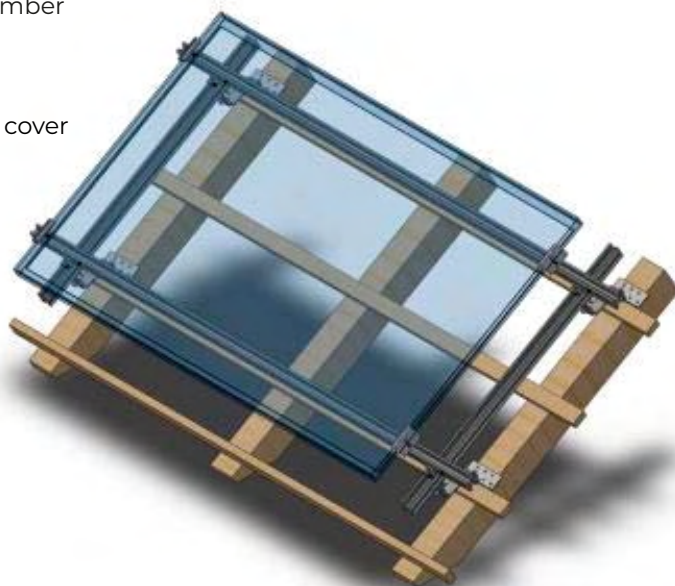
-system elements dimensioned for different types of cover (e.g.hooks with the possibility of adjustment at the installation site

Corrosion resistance

-construction elements made of quality materials (aluminum and stainless steel)

Support

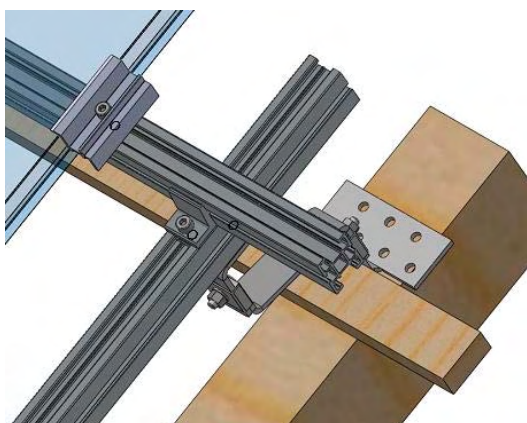
-software package for easy selection of the optimal combination of structural elements with regard to the defined installation conditions



Simple assembly of photovoltaic modules using pre-assembled elements.

Insertion of pre-assembled elements in any place of the longitudinal support.

Installation of longitudinal supports using one screw and the associated clamping plate. Adjusting the position of the longitudinal support in the transverse direction and the distance from the roof surface.



SOLUTION OVERVIEW

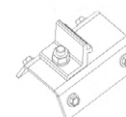
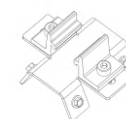
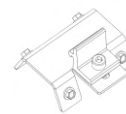
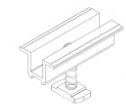
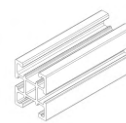
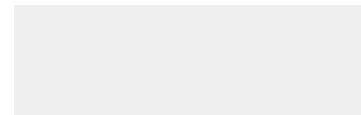
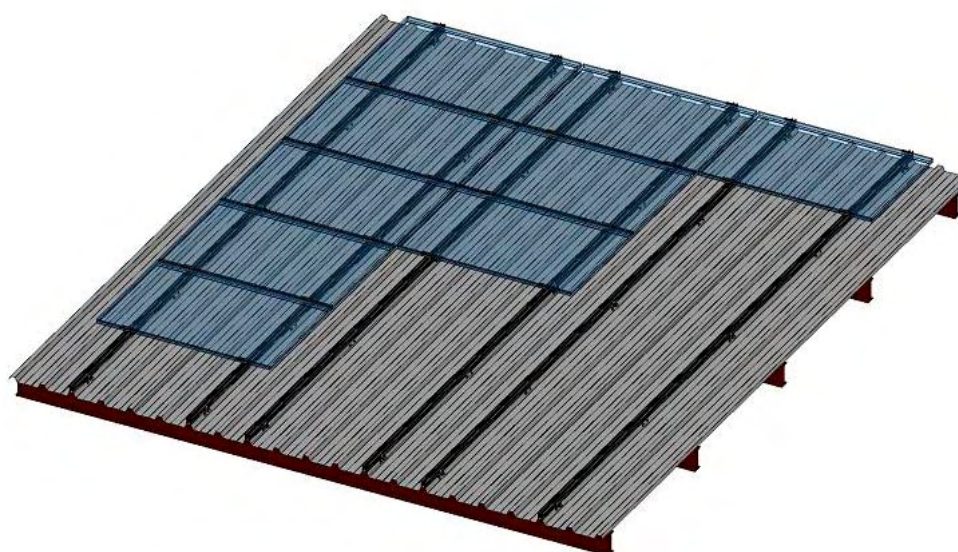
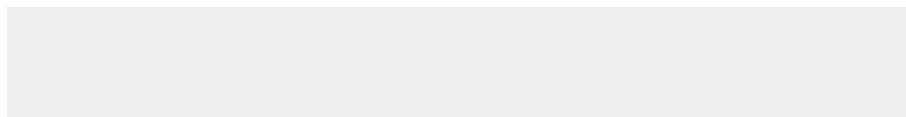
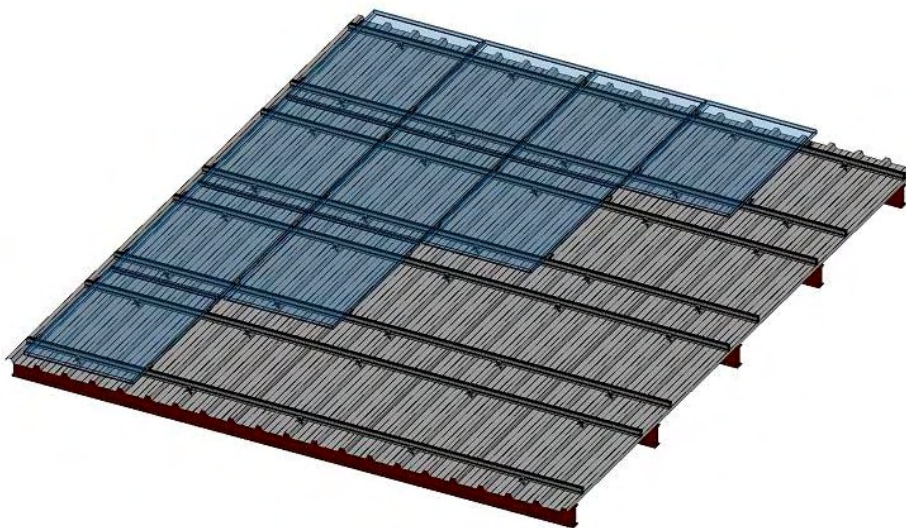
SLOPED ROOF (tiles, shingles...) – SINGLE AND DOUBLE SUPPORTS

A simple system that consists of a small number of (pre)assembled components for simple and quick assembly. The applicability of the solution is subject to verification by experts. Flexibility in choosing the method of acceptance for roof structure (trapezoidal shoe, foundation screw..) and the direction of installation of the basic mounting bracket photovoltaic modules. Thanks to high-quality materials and structural compatibility of the element construction guaranteed long life and reliability.

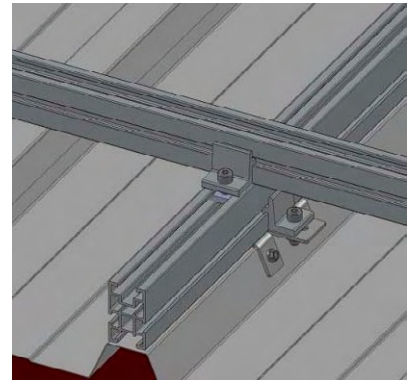
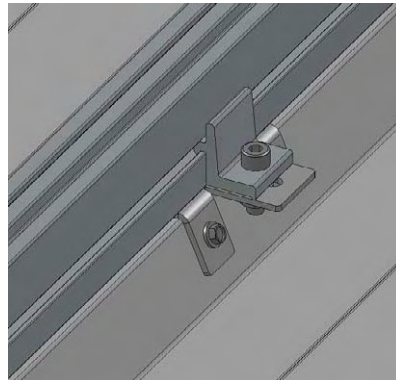
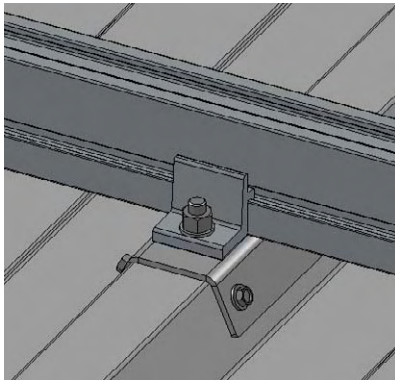
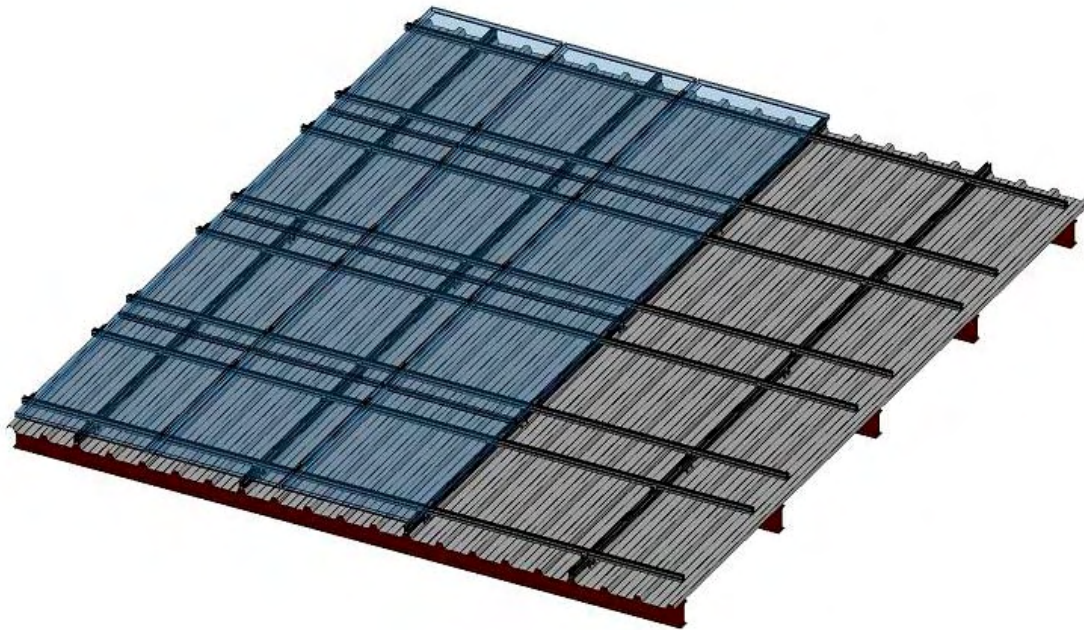
Single carrier - variant A

Construction elements

Single carrier – variant B



Double carrier - variant A



Simple assembly

-the system consists of a small number of pre-assembled structural elements

Flexible solution

-system elements dimensioned for different types of covers with the possibility of adjustment at the installation site

Impermeability of the roof surface

-all roof surfaces are provided with a double seal for safer sealing

ADVANTAGES

Corrosion resistance

-construction elements made of quality materials (aluminum and stainless steel)

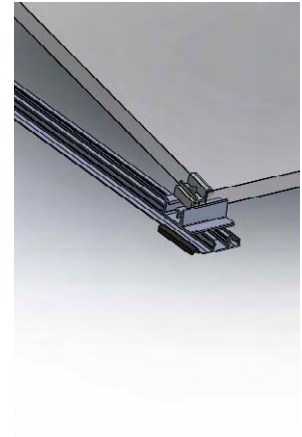
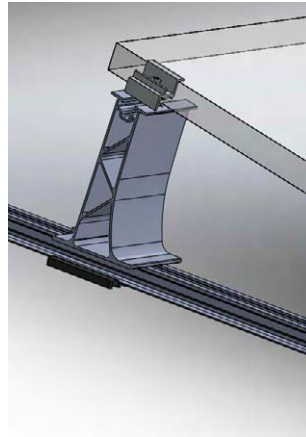
Support

-software package for easy selection of the optimal combination of structural elements with regard to installation conditions defined by the location, installation instructions, calculation of structural elements according to relevant standards

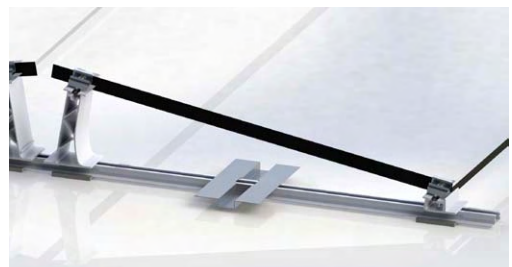
SOLUTION OVERVIEW

FLAT ROOF - ORIENTATION OF THE MODULE TOWARDS THE SOUTH

A simple system consisting of a small number of pre-assembled components for easy and quick assembly. The substructure is mounted on a flat roof without drilling and is reinforced with ballast (concrete blocks 300 x 300, 400 x 400 mm).



MODULE ORIENTATION EAST-WEST



ADVANTAGES

Simple assembly

-the system consists of a small number of pre-assembled structural elements

Flexible solution

-system elements dimensioned for different types of covers with the possibility of adjustment at the installation site

Low weight and safety

-it will be solved optimizes for site load conditions (load from wind and snow)

Corrosion resistance

-construction elements made of quality materials (aluminum and stainless steel)

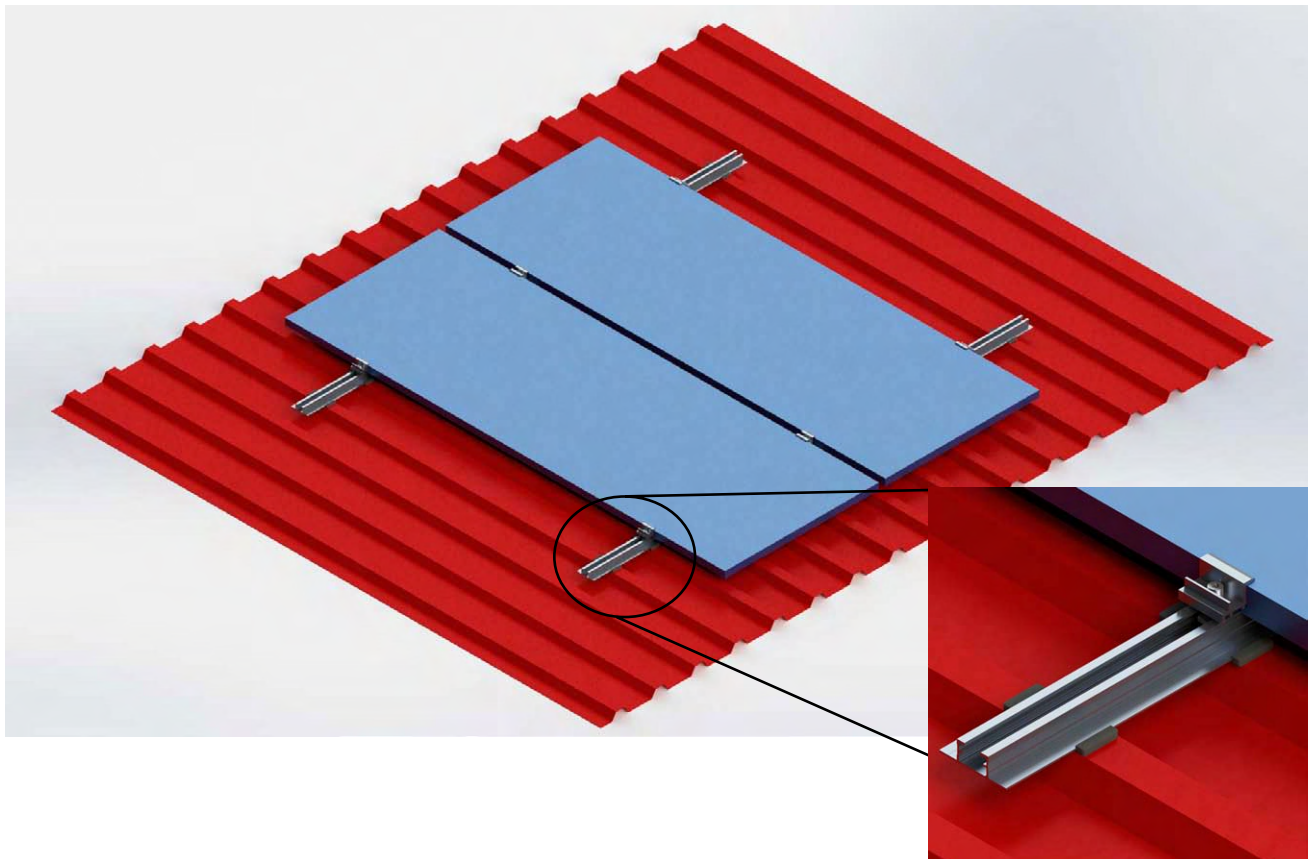
SOLUTION OVERVIEW

ROOF MOUNTING SYSTEM FLOOR ANGLE COVERED WITH A TRAPEZINE SHEET

NS-TL-MINI the system for mounting on trapezoidal sheet roofs is designed to ensure maximum simplicity while satisfying all technical requirements. There are only four different components. Only four different components are enough to build a photovoltaic power plant of unlimited power in just four simple assembly steps. With the system NS-TL-MINI there is no need for cutting, pre-drilling and/or any other processing. Assembly consists of positioning the EPDM tape at the place where the support rests, positioning the support, installing self-drilling screws and tightening to fasten the FN module.

ADVANTAGES OF THE SYSTEM

- NS-TL-MINI is a system for mounting on roofs at angle covered with a trapezoidal sheet
- simple and quick installation from the upper side of the roof surface
- suitable for all dimensions of the FN frame module
- installation of the FN module in a vertical or horizontal position
- Modular configuration
- geometry adapted to other NIKA SOLAR program components
- The small dimensions of the components simplify storage, transport and assembly
- Competitive price



TECHNICAL DATA

AREA OF APPLICATION

Angled roof with a slope of slope of 5° to 60°

TYPE OF ROOF

Minimum thickness of steel sheet 0.5m and minimum thickness aluminium sheet of 0.8mm for sheets with a trapezoidal height spacing between 180 and 350 mm and a minimum overlap width of 25 mm (width of the upper surface of the trapezoid)

FN MODULES

suitable for all standard FN frame modules

MATERIAL

Aluminium(EN AW-6063 T66)

CONNECTING MATERIAL

stainless steel self drilling screws with plate and rubber

CARRYING CAPACITY CALCULATION

Static calculation in accordance with the relevant norms for determining loading and the norm on the dimensioning of structures

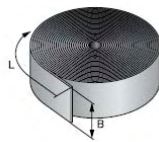
DIMENSIONIN

NS-TL (width 86 mm, height 21 mm, lenght from 350 to 750 mm)

SYSTEM COMPONENTS



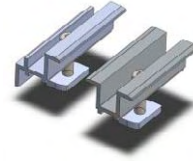
NS-TL-L500/L750



EPDM patch



SMD 5.5x25



NS-0005/NS-0006



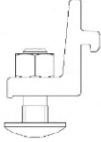
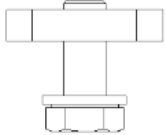
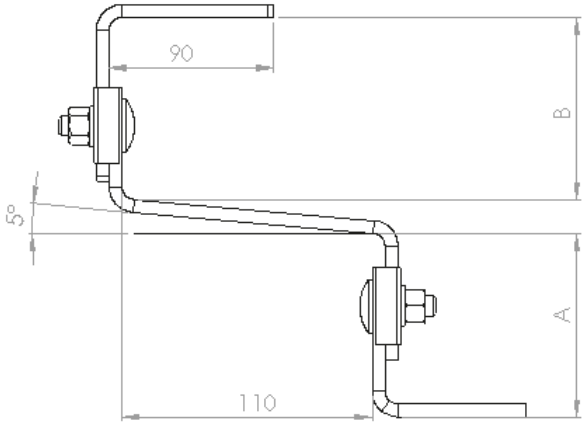


NS-TL-MINI (all system components) with the end support is attached to the FN modules



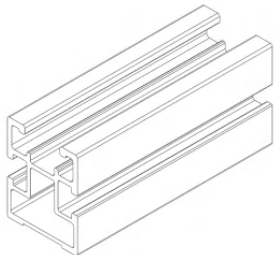
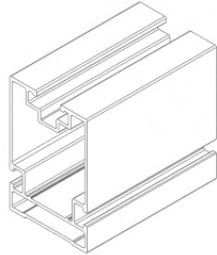
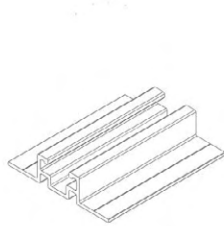
NS-TL-MINI (all system components) with the middle support is attached to the FN modules

SPECIFICATION OF ROOF HOOKS

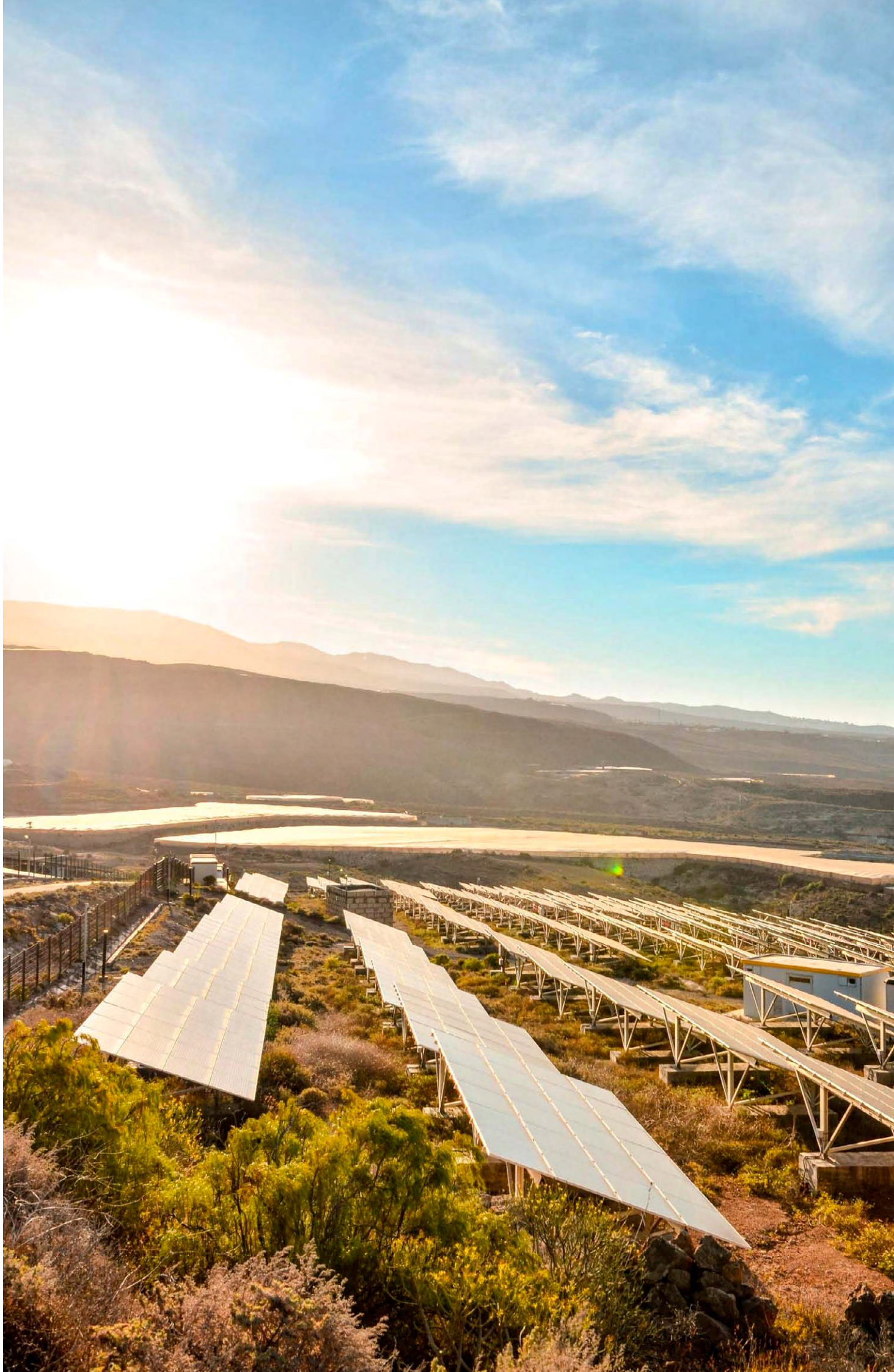
CIRCLE SELECTED / WRITE A SPECIAL REQUEST

						
PERFORMANCE WITH INCLINE	YES 5°			FIXED	MOVABLE	
				B=55	B= 75±25	
	Special request - FIXED					
	B, mm					
	FIXED			MOVABLE		
	A			45	B= 50±15	
				55		
	Special request - FIXED					
A, mm						
						

TECHNICAL CHARACTERISTICS OF BASIC SUPPORTS

			
Specification	NS-0001	NS-0003-1	NS-0004
Material	EN-AW 6063 T66 according to DIN EN 755-2		

Profil		NS-0001	NS-0003-1	NS-0004
Height	mm	45	90	25
Width	mm	36	60	86
Cross-sectional area	mm ²	437	908	388,4
Wy	mm ³	3.946	21.731	2.564
Wz	mm ³	4.040	14.796	2.784
Iy	mm ⁴	88.591	945.932	17.588
Iz	mm ⁴	72.722	443.869	167.049
E1	mm	22.45	43.53	6,86
E2	mm	18	30	60
Young's modul	N/mm ²	72.722	70.000	70.000
Stretching limit	N/mm ²	215	215	200
Mass	kg/m	1.2	2.45	1.05
Lenght	mm	6.000(6.300)	6.000 (6.200)	6.000 (6.200)







NIKA
KONSTRUKCIJE

Ulica Braće Radića 23
42206, Petrijanec, Hrvatska

tel/fax: +385 42 303 166
tel: +385 42 303 167

e-mail: info@nika-konstrukcije.hr
web: www.nika-konstrukcije.hr