ACE.
your primary connection

Connectivity Catalogue

January 2016

▶ *Our ACE concept*

TKF's brand ACE is a certified and guaranteed concept for passive FTTx networks. As a total concept ACE provides the broadband market with a new vision on building fibre optic networks. ACE does not only consist of products, but also guarantees compatibility between all the different components and offers complete, passive solutions.

The demand for broadband is expanding every day. Fibre optic networks are rolled out worldwide. Size and topology of networks vary per region. Therefore TKF innovates continuously to improve our flexible, cost-efficient and easy to install ACE solutions.
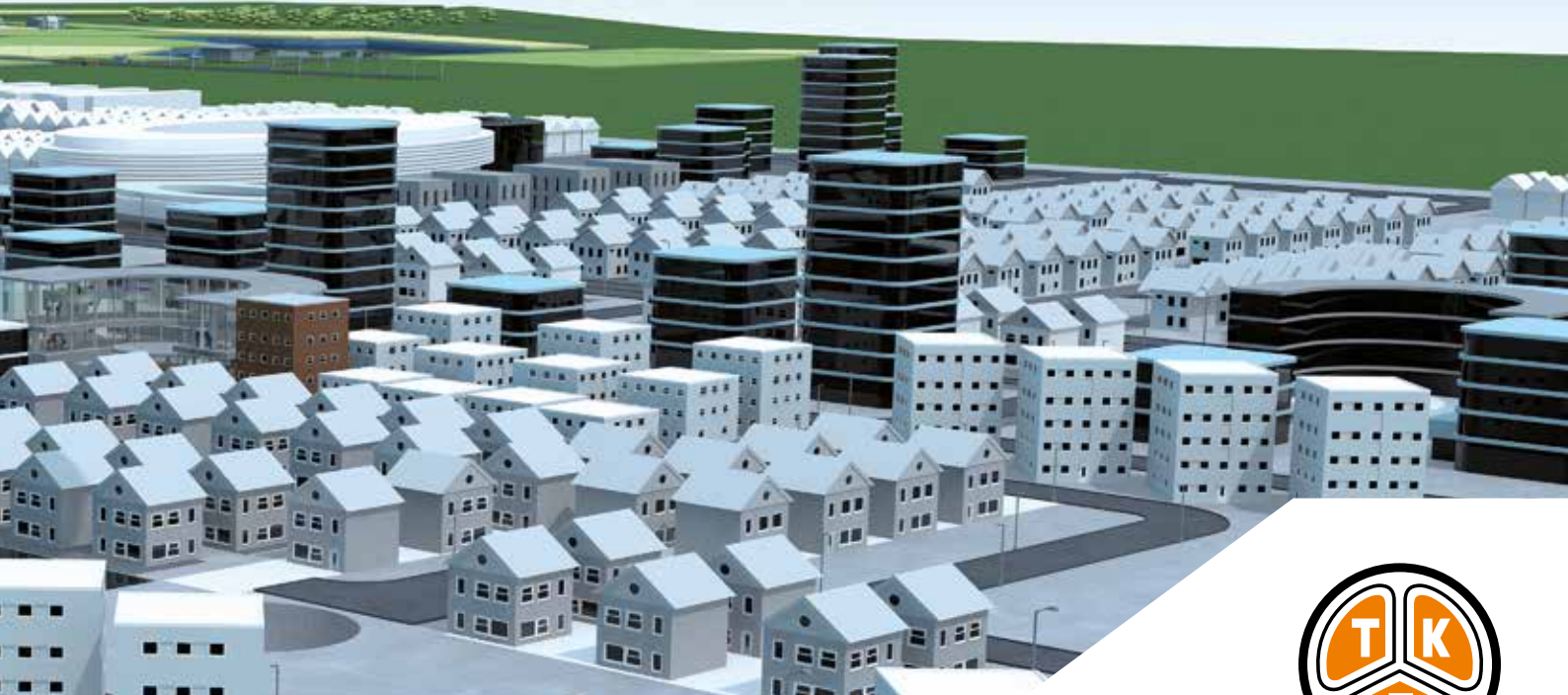
The ACE concept is mainly a success of people. People with knowledge and skills concentrated in the ACE team. Together with our customers we share technical knowledge and new developments at the ACE Academy.

The ACE team is ready to help our customers to stay ahead with continuous development, leading the way in ACE city via the fields of applications: POP, OSP and Subscriber.

▶ *Index*

▶ POP Solutions

Building a FTTx network starts at the drawing board where configuration, technology and planning are defined. One of the most challenging parts of the network is the POP (point of presence). This is the centre (heart) of the network where all connections are made and active equipment is installed and operated. It is essential to exclude all possible risks during installation and operation. TKF has gathered all its experience and know-how within the ACE concept, to cover the full range of options to achieve an optimal POP performance.

POPs need to be built close to the subscribers. Moreover they need to fit into this environment and meet the requirements of the subscribers on construction, size, shape, colour, noise and place. TKF has set up a flexible design that meets all demands. A street cabinet solution or a large POP building, they all fit within the ACE concept.

The ACE POP solution offers:
- Flexible design
- High and super high density ODF
- Optional SAODF (semi-automated ODF)
- Third operator solution
- Partial delivery or turnkey solution

▶ OSP Solutions

Civil work is the major cost driver (>70%) of the total cost of ownership (TCO), to build FTTx networks. The cost of civil work vary from country to country, sandy or rocky soil and paving: tiles, concrete or no paving at all, make a big difference in cost. Within the ACE concept TKF offers solutions for each OSP network to lower the cost per individual challenge.

Direct burial cable solution:
Within the ACE concept, TKF has developed a full range of products making the installation of a direct burial cable concept easy and cost saving. Heavy duty steel or kevlar protected cables are available together with all components, like closures and access chambers that fit in this application.

Modular cabling solution:
In order to meet the various demands (success based installations) it is often required to use a modular cabling system in FTTx networks. ACE offers a full modular cable solution including all accessories like closures, duct connectors, fibre blowing equipment and a special ODF, for easy installation of all tubes within the POP or street cabinet.

Aerial solution:
In case of existing aerial infrastructure (f.i. power lines), it can be cost saving to use this infrastructure to install a FTTx network. ACE offers a full range of ADSS cables suitable for this application.

TKF has experience with sewer paths and fibre through gas pipelines. To prevent expensive digging operations, TKF has looked at all the different trenching possibilities, like macro and nano trenching. All these cost saving solutions can be fully integrated within the ACE concept with warranty and certification.

▶ *Subscriber Solutions*

The main challenge when building a FTTx network is getting access to the subscriber. As we are operating within the public sector, possible challenges are:
- Availability of subscribers during office hours
- Wishes and demands of house and building owners
- Local regulations and cooperation of all subscribers in the chain:
    - Are we allowed to install on the outside of the building?
    - Can we install in hallways, cellars or elevator shafts?

All these solutions and installation options require tailor made products and systems. TKF has developed a total ACE subscriber solution for both single and multi dwelling units (SDU and MDU), that fit all these demands and still keep the cost low.

Special indoor and outdoor cables have been developed. And a full series of fibre splice and patch boxes are available in all required sizes and shapes, designed and tested for this challenging environment.

▶ Rack System ODF-PMF-PPF
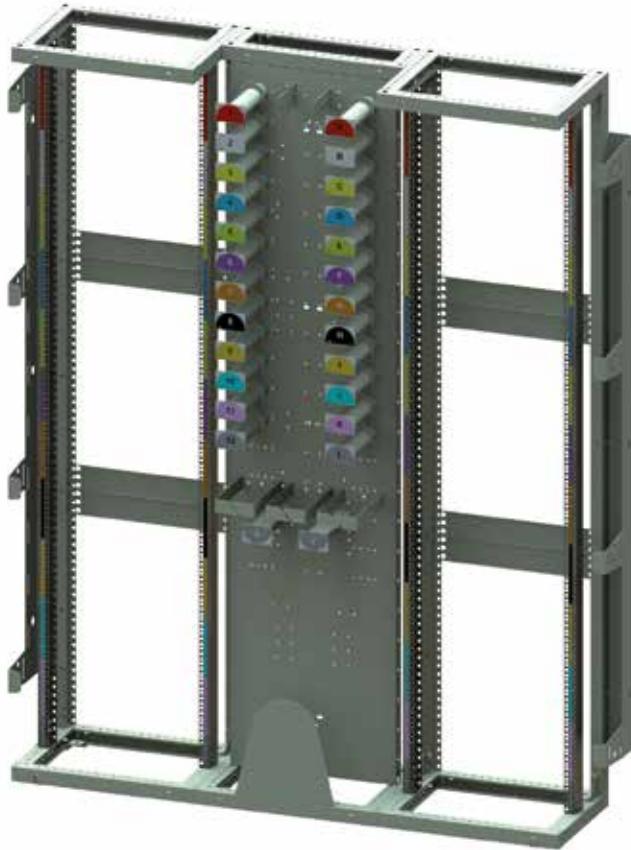
The ACE rack system is designed for housing passive components for fibre distribution. The rack system offers space for optical distribution shelves, patch panel shelves, splitters and other 19" components.

Every height unit can be reached via the keen ACE patch-cord management system, which makes it possible to connect every position inside the rack system with only one cable length. The cable cams provide easy fixation and management of cables. The separation plates on the bend controllers separates the ring feeder patch-cords from the ODF patch cords.

The rack system is provided with cable protection brackets for feeder and distribution cables.

Parameter		Unit	ACE-Rack system
Dimension	Height	mm	2200
	Width		1800
	Depth		400
Capacity			2 x 47 HU
HD fast connect capacity			4512 LC / 2256 SC
Colour			Powder coated RAL7035

Features and applications

- FTTH POP housing
- High density FTTH networks
- Suitable for 19" splice/patch shelfs, patch panel shelfs, splitters and other 19" components
- ACE patch-cord management system
- Bend radius protection throughout the frame
- Fully front accessibility
- Compact and light weight design
- Maximum flexibility and modularity
- Cable entry top and bottom

Art. number	ACE code	Description
561676	RS-WT-A2-NN0-01	ODF Left + PMF + PPF 2200 x 1800 x 400 mm (hxwxd)
561677	RS-WT-A1-NN0-01	ODF Right + PMF + PPF 2200 x 1800 x 400 mm (hxwxd)

N.B.: For customized design or complete solutions, please contact your TKF sales representative.

▶ *HD Fastconnect Splice/Patch Shelf*

The HD fastconnect splice/patch shelf is a versatile 1 HU shelf. The shelf is used for splicing and patching fibres of an optical cable in a rack environment. The shelf accommodates up to 4 ACE HD Fastconnect trays for a total capacity of 96 LC positions. Tubes of the feeder cable enter the shelf at the back. The fibres are terminated to pigtails (SC or LC) and connected onto the adapters. Stripped pigtails (individual strip lengths) and adapters can be mounted in the shelf. Four front patch trays are mounted inside a slide rail. Orientation of adapters is to the right side. Patch-cords are guided to the patch-cord management frame at the right hand side of the tray. For easy accessibility during patching, access to the individual trays is achieved by a two-step sliding mechanism. Unambiguous coding on the trays reduces the risk of mistakes during patching to a minimum.

Parameter		Unit	Splice/Patch shelf type L
Dimension	Height	mm	44.4
	Width		510
	Depth		200 (excl. bend control guide)
Capacity			1 HU 4 HD Fastconnect trays 96 LC or 48 SC positions
Colour			Frame: black Overlength storage module: green Patch tray: Natural white Pigtails: IEC 60304 / VDE 0888-3

Features and applications

- Compact and light weight design

- 1HU - 19" - 96 fibers

- Stripped pigtails and premounted adapters reduce installation time

- Two-step sliding mechanism for easy accessibility

- High density FTTH networks

- Suitable for mounting in the ACE rack s ystem

- Extension kit transforms two 1HU shelves to one 2HU shelf

- Feeder cable protection

Art. number	ACE code	Description
485008	SH-L1-BLS-VL7	HD Fastconnect Splice/patch shelf - 19" right prefab 96x LC/APC 8°
485009	SH-L1-ALS-VL7	HD Fastconnect Splice/patch shelf - 19" left prefab 96x LC/APC 8°
485002	SH-L1-BLS-VL5	HD Fastconnect Splice/patch shelf - 19" right prefab 96x LC/PC
485003	SH-L1-ALS-VL5	HD Fastconnect Splice/patch shelf - 19" left prefab 96x LC/PC
485004	SH-L1-BMS-NS7	HD Fastconnect Splice/patch shelf - 19" right prefab 48x SC/APC 8°
485005	SH-L1-AMS-NS7	HD Fastconnect Splice/patch shelf - 19" left prefab 48x SC/APC 8°
485020	SH-L1-EXT-01	Extension kit shelf type L connecting 2 shelves 1HU incl. protection cover

N.B.: Above part numbers refer to crimp splice protector holders.
For other configurations please contact your TKF sales representative.

ACE.

▶ *Optical Distribution Frame*

The ACE optical distribution frame is an ETSI all purpose metal rack designed to reach the maximum modularity and flexibility to allow easy on-site assembly. Optical cables and patchcords are organized, stored and mechanically protected in the side extensions of the rack. Shelves can be back-mounted in the base frame of the rack.

The modular design suits any specific application. The rack configuration is composed of modular units: a central frame and side extensions. The rack permits a structured division and distribution of the cable elements. It features a cable termination system with provision for the strength member attachment, grounding of metal elements, adequate bend control on all fibres, routing and complete flexibility in patching from one side to the other, without the need to pre-calculate the individual cable length. Various mounting options: stand alone, side-to-side, back-to-back.

Parameter		Unit	ACE-ODF-1	ACE-ODF-2
Dimension	Height	mm	2000	2200
	Width		see ordering info	
	Depth		300	
Colour			Powder coated RAL7035	
Capacity			72 MU	80 MU

Features and applications

- Exchange, primary distribution points, customer's premises
- Central offices, telecommunication equipment rooms
- Weather-protected locations, such as building basements
- Bend radius protection throughout the frame
- Fully front accessibility
- Maximum flexibility and modularity
- ETSI Compliant
- Cable entry top and bottom

▶ *Optical Distribution Frame*

600	600 mm
150	150 mm
300	300 mm

Art. number	ACE code	Description
400860	RS-ODF-1-600-AN	ETSI standard Rack 2000 mm height
400861	RS-ODF KIT-1-150	Side rack 2000 x150 mm (hxw)
400862	RS-ODF KIT-1-300	Side rack 2000 x 300 mm (hxw)
400865	RS-ODF-2-600-AN	ETSI standard Rack 2200 mm height
400866	RS-ODF KIT-2-150	Side rack 2200 x150 mm (hxw)
400867	RS-ODF KIT-2-300	Side rack 2200 x 300 mm (hxw)

N.B.: Side racks 150mm incl. 6 patch-cord drums, side racks 300mm incl. 12 patch-cord drums.

▶ *Kits*

| 400854 | 400856 | 400857 |

Art. number	ACE code	Description
400854	RS-STD KIT-CTS	External plant cable termination splitter
400856	RS-ODF KIT-CPK	Cable attachment plate kit
400858	RS-SC-12/16	Single clamp for 1 cable diameter 12-16 mm, strengh member connector included
400859	RS-SC-22/28	Single clamp for 1 cable diameter 22-28 mm, strengh member connector included
400857	RS-ODF KIT-6DRUMS	Patch-cord cable drums, 6 pieces

▶ *Compact ODF*

ACE Compact Optical Distribution Frame is developed to manage all types of fibre cables in restricted space.

Each door and panel can be removed and locked by a handle. Cable entrance and patchcord outlet are possible at the top and at the bottom of the rack.

Sub-rack can be drawn out easily with free access to splicing and patching areas. Modular concept allows basic rack to accommodate up to 5 modules for patching/splicing.

ACE Compact ODF capacity can vary from 120 fibers (two fibers per tray) up to 240 fibers (four fibers per tray) with single-circuits fibre management.

Features and applications

- ETSI standard
- Unbundling access networks
- Small area central office
- Compact multipurpose patch/splice rack and modules
- Modular concept, all panels removable
- Patch-cord management and extra-length storage

Description	
Dimensions (mm)	2200x300x300 (hxwxd)
Colour	RAL-7035 (powder coated)
Rack capability	up to 5 modules
Sub-rack capability	24 LC duplex or 48 SC simplexconnectors
Pigtail colour	White

Art. number	ACE code	Description
400880	RS-CODF-2-300-AN	Compact ODF 2200x300x300 mm (hxwxd)
400881	RS-CODF-SR-1	48 SC/PC simplex preloaded subrack
400882	RS-CODF-SR-2	24 LC/PC duplex preloaded subrack
400883	RS-CODF-SR-3	48 SC/APC simplex preloaded subrack
400884	RS-CODF-SR-4	24 LC/APC duplex preloaded subrack

N.B.: Above part numbers refer to heat shrink splice protector holders. For other configurations please contact your TKF sales representative.

Racks

▶ *Pivoting Tray Drawer*

The ACE Pivoting Tray Drawer is suitable to splice and patch fibre optic cables using the most common connector types (SC & LC). It can easily integrate splitters, WDMs and any other passive devices. The drawer is a fixed 19" frame in which pivoting trays are mounted. In each tray splice cassettes, pigtails and connectors can be pre-assembled.

The unit can have the following configurations:
- patch and splice
- patch and patch

19" or ETSI mounting brackets for back mounting are provided. Removable front cover and pivoting tray allow easy patch-cord installation and re-accessibility. Angled patch panel reduces the risk of eye damage. Minimum bending radius 30 mm is guaranteed. The drawer is painted in light grey (powder coated) RAL 7035.

Features and applications
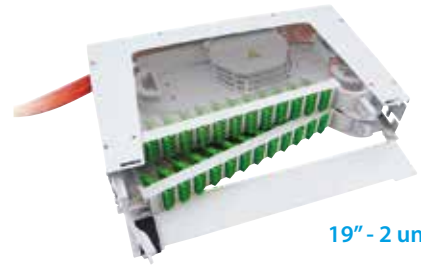
• Ultimate connectivity density

• Pivoting trays for easy installation and maintenance

• Full bend radius control

• Pre-loaded pigtails on request

• Inside and outside plant installation

• Future proof for high density applications

▶ *Pivoting Tray Drawer*

19" - 1 unit

19" - 2 units

19" - 3 units

PTD	Dimension in mm			Capacities
	Height	Width*	Depth	no. F.O.
19" - 1U	44	445	280	up to 48
19" - 2U	85	445	280	up to 96
19" - 3U	125	445	280	up to 144
19"- 4U	167	445	280	up to 192

* Dimension excl. mounting brackets

Art. number	ACE code	Description
405709	SH-PTD-MIR1-HD4-12H-S2-48-48	PTD - 1HU, 19", right pivoting incl. 48x SC/APC 8° pigtails & adapters
405712	SH-PTD-MIR2-HD4-12H-S2-96-96	PTD - 2HU, 19", right pivoting incl. 96x SC/APC 8° pigtails & adapters
405713	SH-PTD-MIR3-HD4-12H-S2-144-144	PTD - 3HU, 19", right pivoting incl. 144x SC/APC 8° pigtails & adapters
405721	SH-PTD-MIR4-HD4-12H-S2-192-192	PTD - 4HU 19" right pivoting incl. 192x SC/APC 8° pigtails & adapters
405717	SH-PTD-MIL1-HD4-12H-S2-48-48	PTD - 1HU, 19", left pivoting incl. 48x SC/APC 8° pigtails & adapters
405718	SH-PTD-MIL2-HD4-12H-S2-96-96	PTD - 2HU, 19", left pivoting incl. 96x SC/APC 8° pigtails & adapters
405719	SH-PTD-MIL3-HD4-12H-S2-144-144	PTD - 3HU, 19", left pivoting incl. 144x SC/APC 8° pigtails & adapters
405722	SH-PTD-MIL4-HD4-12H-S2-192-192	PTD - 4HU 19" left pivoting incl. 192x SC/APC 8° pigtails & adapters

N.B.: Above part numbers refer to heat shrink splice protector holders, pigtail colour white.
Front mounting bracket available on request.
For other configurations please contact your TKF sales representative.

▶ *Sliding Tray Drawer*

ACE sliding tray drawer is used for splicing loose tube cables, and patching the pigtails to patch-cords or for patching only (patch-cords and assemblies).

The ACE sliding tray drawer is used instead of front patching, when full easy access at both sides of the connection is required.

Whithin the tray a patch can be made to every position with a perfect control of the patchcord overlength.

Accurate design and compact adapters allow to accommodate 12 terminations (24 SFF connectors) per tray.

Swing-removable adapter holders make it easy to access the connection at both sides. Kits to attach cables at the side or at the back of the shelf are available.

PLC splitters or other optical passive components can be integrated.

Parameters		Tray	Unit	19"
Dimensions	Height	2	mm	44 (1HU 1.75")
		4		88 (2HU 3.5")
		6		125 (3HU 5.25")
		8		167 (4HU 7.0")
	Width			445*
	Depth			280
Colour				Powder coated RAL7035
Pigtail colour				White

* Dimension excl. mounting brackets

Pre-loaded drawers with adapters and pigtails are available.

▶ *Sliding Tray Drawer*
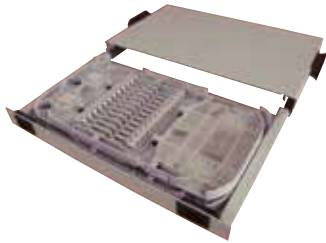
1U

2U

3U

4U

Art. Number	ACE code	Unit	Standard Connectors	SFF Connectors
405700	SH-STD-1I	19"- 1HU	24	48
405701	SH-STD-2I	19"- 2HU	48	96
405702	SH-STD-3I	19"- 3HU	72	144
405703	SH-STD-4I	19"- 4HU	96	192

N.B.: Above part numbers are sliding tray drawers without trays

PST Patch Splice Tray

Tray base with splice area cover   Adhesive label set

12 adaptor clips   Pre-installed adapters

Splice protection holders   Pre-loaded pigtails or micro fan-out

Patch and Splice Tray

POT Patch Only Tray

Tray base   Adhesive label set

12 adaptor clips   Pre-installed adapters
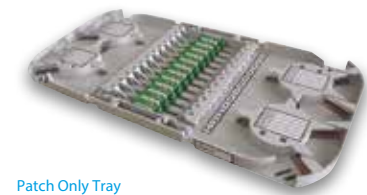
Patch Only Tray

Art. number	ACE code	Description
405692	SH-PST-H-S2-12-12	Patch and splice tray preloaded with 12 SC/APC adapters and pigtails
405693	SH-PST-H2-L2-12-24	Patch and splice tray preloaded with 12 LC/APC duplex adapters and 24 pigtails
405694	SH-POT-S2-12	Patch only tray preloaded with 12 SC/APC adapters
405695	SH-POT-2L2-12	Patch only tray preloaded with 12 LC/APC duplex adapters
405684	SH-STDKIT-EMB1	Mounting bracket 19" - ETSI 1 HU symmetric
405685	SH-STDKIT-EMB2	Mounting bracket 19" - ETSI 2 HU symmetric
405686	SH-STDKIT-EMB3/4	Mounting bracket 19" - ETSI 3/4 HU symmetric

N.B.: Above PST part numbers refer to heat shrink splice protector holders, crimp splice protector holders available on request.
Cable input on the left, patch-cord output on the right, other configurations available on request.
For other configurations please contact your TKF sales representative.

▶ *Sliding Splicing Drawer*

Please refer to ACE-STHD splice trays to configure your splice needs

The ACE Sliding Splicing Drawer is a product designed to splice cables to cables and cable to pigtails. The product can be used inside the ODF racks in combination with STD shelves to terminate pigtails.

The main distinguishing features of the product are the use of HD splice trays for splicing; the integration of passive components such as PLCs; the ability to terminate pigtails using optical Pigtail Kevlar Retainer and to facilitate the installation with pre-assembly tubes to guide the fibers within the sub-rack to reach the splice trays.

Subrack Type	Dimension in mm			Unit
	height	depth	width*	
SSD 19"	125	280	445	3U

* Dimension excl. mounting brackets

Splicing Capacity	Splicing Cable to Pigtails	
	SSD 19"	
	fibers	trays
2 fibers per tray	96	48
4 fibers per tray	192	48

PKR Kit
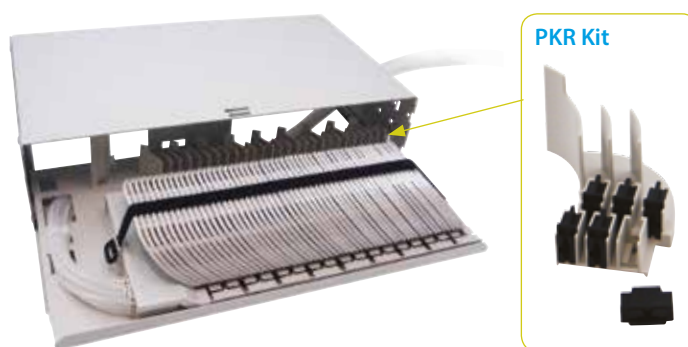
Splicing Capacity	Splicing Cable to Cable	
	SSD 19"	
	fibers	trays
2 fibers per tray	96	48
4 fibers per tray	192	48
12 fibers per tray	576	48
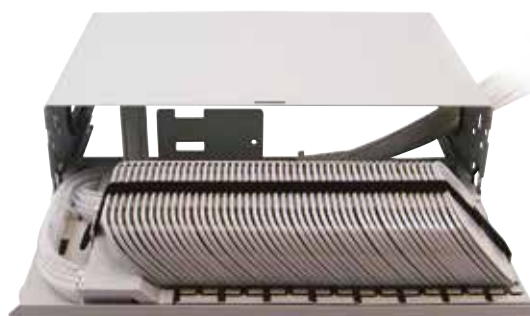
Art. number	ACE code	Description
405730	SH-SSD-3I-C2P-N	Sliding splicing drawer - 3 units, 19" - cable to pigtails - empty
405731	SH-SSD-3I-C2C-N	Sliding splicing drawer - 3 units, 19" - cable to cable - empty
405740	SH-SDKIT-PKRM	Splicing drawer kit - pigtail kevlar retainer
405686	SH-STDKIT-EMB3/4	Mounting bracket 19" - ETSI 3/4 HU symmetric

N.B.: For other configurations please contact your TKF sales representative.
SDKIT-PKRM = 1x bend controller & 6x retainer.

▶ *Patch-cord Management Shelf*

The ACE patch-cord management shelf is a mechanical shelf assembly which can be used either to store overlength of patch-cords or to route them from one lateral duct to the opposite one in a controlled way. Four half round drums are used to guide patch-cords entering from either the left or the right side.

Drums can be re-arranged in such a way to manage cords in a horizontal way. The shelf is available in different heights. Design allows easy access for incoming and outgoing fibers. Front cover protects the patch-cords when open frames are used.

Features and applications

- Within racks or outdoor cabinets

- 19" and ETSI mounting

- Entrances/exits both left and/or right sides

- Drums to secure bend radius protection of the patch-cords

3U

1U

Parameter	Unit	JMDI1	JMI 3
Height	mm	44 1HU	124 3HU
Width*	mm	445	445
Depth	mm	265	265
Storage Capacity	m	75	150
Colour		Powder coated RAL 7035	

N.B.: Storage capacity based on 3mm patch-cords
* Dimension excl. mounting brackets

Art. number	ACE code	Description
405680	SH-PMS-I1	Patch-cord management shelf, 1HU 19" sliding
405681	SH-PMS-I3	Patch-cord management shelf, 3HU 19"

▶ *Ducts and Tubes*

Ducts and tubes offer a protective path for fibre infrastructure. 3 Classifications can be distinguished: micro tubes with a diameter of ≤ Ø 5 mm, mostly bundled in multi tube cables, mini tubes with a diameter of ≤ Ø 16 mm, these are bundles in multi tube cables or utilized as single conduit, and ducts with a diameter of > Ø 16 mm.

Features and applications

- Ducts and tubes are tested in combination with TKF cables
- Ducts and tubes are an integrated part of the ACE solution
- Large scale experience in civil works and cable blowing
- ACE connectors designed and tested in combination with the ducts and tubes

TKF cable blowing test facility

HDPE duct

Mini tube PE direct buried

Mini tube PE direct buried

Mini tube PE

Mini tube indoor LFH

Micro tube PE

N.B.: For detailed information about ducts and tubes please contact your TKF sales representative.

Ducts and tubes

▶ *Multi Tube Cables*

Multi tube cables are an assembly of micro or mini tubes. The ACE multi tube cable portfolio covers a complete range of assemblies with a large variety of tube numbers and tube diameters, suitable for both indoor and outdoor applications.

Features and applications

- Future-oriented network
- Just-in-time investment
- Fibre replacement possible at any time
- Flexible engineering
- Reducing splicing and distribution points

MTC direct buried tubes

MTC direct install

MTC low fire hazard

MTC direct buried tubes

Ducted MTC direct buried tubes

MTC PE tubes

N.B.: For detailed information about Multi Tube Cables please contact your TKF sales representative.

Multi tube cables

▶ *Connectors*

ACE provides a complete program of high quality tube connectors: straight, end, reduction and gas-block. Connectors are available for direct install (DI) and direct burial (DB) applications.

5 mm - 20 mm

Features and applications

- ACE tube connectors are tested according international standard IEC 50411-2-8
- Deutsche Telecom (German Telecom) approved
- Transparent body allows verification of the position of the tube inside the connector for push-fit connectors
- Compact size
- Push-fit up to 20 mm
- Secure ring that is fixed after installation of the tube for push-fit connectors
- Re-installable
- Colour of the collar indicates the DB (blue) or DI (green) functionality for push-fit connectors

	ART. NUMBER	TUBE SIZE IN	TUBE SIZE OUT	BORE SIZE
	510325	5	5	3.5
	510324	7	7	4
	510328	10	10	6
	510326	10	10	8
	510329	12	12	8
	510327	12	12	10
STRAIGHT CONNECTOR	510323	14	14	10
	510322	16	16	12
	510319	20	20	16
	401201	32	32	25.3
	401202	40	40	32.6
	401203	50	50	40.8

	ART. NUMBER	TUBE SIZE
	510335	5
	510334	7
	510336	10
	510337	12
END CONNECTOR	510333	14
	510338	16
	510339	20
	401237	32
	401238	40
	401239	50

	ART. NUMBER	TUBE SIZE IN	TUBE SIZE OUT	BORE SIZE
	510311	14	12	10
	510310	12	10	8
REDUCTION CONNECTOR	401204	40	32	32.6 - 25.3
	401206	50	40	40.8 - 32.6

32 mm - 50 mm

N.B.: For gasblock connectors or other connector sizes please contact your TKF sales representative.

▶ *Tube Management Closures*

Tube closures are an excellent and cost effective solution to branch-off and connect duct and blown fibre tubes. The tube closures are suitable for different types and sizes of tubes and ducts.

The ACE 2-way and 4-way tube closures are divisible direct buried closures which can be used for:
• Transition of tube to tube (same diameter)
• Transition of tube to different diameter tube
• Transition of microtube to microtube (one-on-one proportion)
• Transition of several microtubes to tube
• Transition of several minitubes to modular cable

The closure is used for fibre network maintenance and fibre or tube blowing features.

The strain relief inlay parts are exchangeable, therefore it is possible to use one housing for several diameters and applications. A range of 25, 32, 40 and 50 mm are available for use with the closure housing.

Tube connectors are easy to install due to the length of the closure.
The closure can be installed without any special tooling.

Art. number	ACE code	Description
530224	CL-R2-T-40-40	2-way tube closure in-line 40 mm
530225	CL-R4-T-40-40-40-40	4-way tube closure in-line 40 mm
530229	CLAC-RX-CL0325	Tube closure clamp 25 mm
530228	CLAC-RX-CL0332	Tube closure clamp 32 mm
530226	CLAC-RX-CL0350	Tube closure clamp 50 mm

The ACE MC type 5 branch-off closure is a twin shell re-openable that serves as mechanical protection when extending or branching off multi tube cables. The closure is applied at the position where the outer sheath of the multi tube cable DB is removed and tubes are extended or branched off with tube connectors.

The 4 ports (2 ports on both sides) can be used for different diameters:
• 50 mm max (smaller diameters are 46, 39 and 33 mm)
• 50 mm max (smaller diameters are 34, 30 and 17 mm)

The closure is sand-tight. A metal bracket inside the closure is used to fix cables with hose clips.

Art. number	ACE code	Description
530332	CL-5A-T	Tube management closure branch-off closure MC type 5 black
530345	CL-5A-T-P	Tube management closure branch-off closure MC type 5 purple

N.B.: For other configurations please contact your TKF sales representative.

▶ *Small Termination Closure*

The ACE small termination closure is constructed to support butt or in-line low count splice applications in a direct buried environment and pole/wall mounted applications nearby the subscriber.

The closures' compact size and rugged exterior allow for installation in tight spaces without compromising functionality. With the included heatshrink splice protectors this closure is ready for splicing (or repairing).

Four corner entrance ports provide the installer the flexibility to quickly configure the closure as needed.

POP

OSP

Subscriber

Features and applications

• Compact size

• Cost effective solution ideal for quick restoration of damaged/cut fibre service drops

• Quick to assemble, no tools required for assembly

• Flexible sealing technology supports a wide range of flat or round cable profiles

• Sealing and fixation adjusted for 6 mm cable

• Designed for direct buried, below grade, pole/wall mount or aerial applications

• Re-enterable and re-usable

• In-line and butt applications

• Max. capacity 12 splices

• Flat shape allows for mounting in small areas

| Patchpanel

ACE small termination closure standard including:

4 pcs	Sealing grommets 4.3 - 6.4 mm
1 pcs	ANT splice holder
1 pcs	Heatshrink splice holder

ART. NUMBER	ACE CODE	DESCRIPTION
563200	CL-XS-S001	ACE small termination closure
563207	CL-XS-SGK01	Sealing grommet kit d: 6.4 - 9.4 mm incl. dummy (4 pcs)
563205	CLAC-XS-PP03	Patchpanel ACE small termination closure 3 x SC duplex

N.B.: For other configurations please contact your TKF sales representative.

▶ *µODC Closure*

The highly versatile ACE µODC closure is specially designed for loose tube and soft-tube cables in the FTTx networks.
Thanks to the unique features which comply the new market requirements:

- Compact dimensions (< 2 liters)
- Mechanical and waterproof protection (IP 68)
- Versatile and flexible usage (buried, aerial, facade installation) in outdoor environment

Depending on the configuration, the µODC can be used in different configurations: in-line, butt or tap-off with easy access or re-entry.

The closure allows cable loop configurations in combination with up to 18 drops cables. Uncut loose buffer tube storage space is available thanks to the hinged frame.

The fibre management system offers cable fixation, protection of the tube loops and positive routing for the fibres with a minimum bend radius of 30 mm throughout the whole system. Similar to the complete ACE closure family, the standard cassette ACE-STHD is used for splicing.

The cable entries can be sealed using the unique mechanical gaskets from ACE.

Optionally the closure can be provided with a pressure valve and a grounding point.

Features and applications
• G.652-G.657 fibre compatible (standard STHD cassette)
• Positive fibre management (secured min. bend radius)
• Latch closing system
• Easy installation - friendly use
• High reliability - IP68 and IK10

Dimension and capacity	
Dimensions (mm)	240x180x65 (hxwxd)
Colour	Black or gray
Capacity	• up to 72 fibres • 18 cables up to Ø 7 mm • 2 cables up to Ø 16 mm

▶ µODC Configurations

Art. number	ACE-code	Description
563140	CL-MODC-LT-4HD12H-2F-6B-YB	Micro closure 48 fibre heatshrink, black
563141	CL-MODC-LT-4HD12H-2F-6B-YG	Micro closure 48 fibre heatshrink, grey
563142	CL-MODC-LT-4HD12A-2F-6B-YB	Micro closure 48 fibre crimp (ANT), black
563143	CL-MODC-LT-4HD12A-2F-6B-YG	Micro closure 48 fibre crimp (ANT), grey
563144	CL-MODC-LT-3HD24H-2F-6B-YB	Micro closure 72 fibre heatshrink, black
563145	CL-MODC-LT-3HD24H-2F-6B-YG	Micro closure 72 fibre heatshrink, grey
563146	CL-MODC-LT-6HD12A-2F-6B-YB	Micro closure 72 fibre crimp (ANT), black
563147	CL-MODC-LT-6HD12A-2F-6B-YG	Micro closure 72 fibre crimp (ANT), grey
563148	CL-MODC-LT-6HD12H-2F-6B-YG	Micro closure 72 fibre heatshrink, black

N.B.: For detailed information about the micro closure or other configurations please contact your TKF sales representative.

µODC closures standard incl.:

Feeder gaskets
2 pcs   FG 5-9 mm, blue
2 pcs   FG 9-13 mm, white
2 pcs   FG 13-16 mm, red

Blind gaskets
6 pcs   Blind gasket

▶ µODC Sealing Kits

Art. number	ACE-code	Description
563173	CL-MODC-FG-5-9	Feeder gasket 5-9 mm, blue (12pcs)
563174	CL-MODC-FG-9-13	Feeder gasket 9-13 mm, white (12pcs)
563175	CL-MODC-FG-13-16	Feeder gasket 13-16 mm, red (12pcs)
563171	CL-MODC-DG-3x4-7	Drop gasket 3 x 4-7 mm (12pcs)
563172	CL-MODC-DG-6X2	Drop gasket 6 x 2 mm (12pcs)
563176	CL-MODC-DG-2X6	Drop gasket 2x6 mm, green (12pcs)
563152	CL-MODC-BG-12	Blind gasket (12pcs)

| Feeder gasket 9-13 mm | Drop gasket 3x 4-7 mm | Drop gasket 2x 6 mm |

Fibre closures

▶ *Compact Fibre Optical Closure*

The ACE compact fibre optic closure has mainly been developed for FTTH access networks. Thanks to its slim design the closure can be used for both underground and aerial applications. Suitable for splicing of standard optical cables or for blowing of micro-cables, the compact closure is the ideal solution for an access network. The flat rectangular shape guarantees installation in compact environment such as small hand-hole or cabinet. The space behind the frame can be used either as storage for uncut loose buffer tubes or as a patching point.

Parameter		Units	A	B
Dimensions	Height	mm	380	450
	Width		290	290
	Depth		150	150

			DOME A 380 mm		DOME B 450 mm	
		Splice tray	Heat shrink	ANT	Heat shrink	ANT
BASE A Splice capacity		HD4	96	96	192	192
		HD6	144	144	288	288
		HD3-24	144	-	288	-

N.B.: HD6 for heatshrink is only suitable for G.657 fibre

Art. number	ACE code	Description
568184	CL-CFOC-AA-NN	Compact fibre optic closure with 1 oval & 6 round ports base (L=380 mm)
568185	CL-CFOC-AB-NN	Compact fibre optic closure with 1 oval & 6 round ports base (L= 450 mm)

▶ *Fibre Optical Closure*

ACE fibre optic closure is an environmentally sealed single-ended optical closure for the fibre management system that provides the functions of splicing and passive component integration in the outside plants (IEC 529, IP 68). A wide range of configurations can be arranged by adding ACE-STHD modules and/or passive device sub-assemblies.

It has provision for all cable termination and sealing requirements. One or two oval entry ports for looped (uncut) cable and six, eight or eighteen round ports for drop cables entry/exit are provided in the base. Uncut loose buffer tube storage space is available between the two stacks. Depending on the installation conditions, suitable cable seals kits are available.

Base	Units	A		B		C	
Number of cable ports	mm	1 oval	14 ~ 25	1 oval	14 ~ 25	2 oval	14 ~ 25
Cable dia. range	min-max	6 round	8 ~ 28	6 round 12 round	6 ~ 20 6 ~ 14	8 round	8 ~ 28
Dome	Units	A		B		C	
Height	mm	390		525		770	
Diameter	mm	247 (285 with clamp)					

▶ *Fibre Optical Closure*

		Dome A 390 mm		Dome B 525 mm		Dome C 770 mm	
	Splice tray	Heat shrink	ANT	Heat shrink	ANT	Heat shrink	ANT
Base A **247 mm** - **285mm with clamp**	HD4	288	288	576	576	1056	1056
	HD6	432	432	960	960	1584	1584
	HD3-24	432	-	960	-	1584	-

	Splice tray	Heat shrink	ANT	Heat shrink	ANT	Heat shrink	ANT
Base B **247 mm** - **285mm with clamp**	HD4	288	288	576	576	-	-
	HD6	432	432	960	960	-	-
	HD3-24	432	-	960	-	-	-

	Splice tray	Heat shrink	ANT	Heat shrink	ANT	Heat shrink	ANT
Base C **247 mm** - **285mm with clamp**	HD4	-	-	480	720	1056	1056
	HD6	-	-	720	720	1584	1584
	HD3-24	-	-	720		1584	

N.B.: HD6 for heat shrink is only suitable for G.657 fibre

Art. number	Ace code	Description
568160	CL-FOC-AA-NN	Closure with 1 oval & 6 round ports base (L=390 mm)
568161	CL-FOC-AB-NN	Closure with 1 oval & 6 round ports base (L=525 mm)
568162	CL-FOC-AC-NN	Closure with 1 oval & 6 round ports base (L=770 mm)
568164	CL-FOC-BB-NN	Closure with 1 oval & 18 round ports base (L=390 mm)
568165	CL-FOC-BC-NN	Closure with 1 oval & 18 round ports base (L=525 mm)
568167	CL-FOC-CB-NN	Closure with 1 oval & 18 round ports base (L=770 mm)
568169	CL-FOC-CC-NN	Closure with 2 oval & 8 round ports base (L=525 mm)

▶ *Demarcation Optical Closure*

The ACE demarcation and compact demarcation closure are environmentally sealed single-ended optical closures to manage the demarcation point from the operator network ends and the customer's on-premises wiring. These demarcation closures are the ideal solution for a flexible carrier demarcation point with dimensions and splice/connection capacities suitable to satisfy all requests.

Large splice capacity HD trays used together with compact and positive design allows that extra carriers/customers can be connected to the backbone side of the network without affecting other, already connected carriers/customers. These closures have the same features and benefits of standard ACE fibre optic closures (IEC 529, IP 68). Also the same sealing methods can be applied. Due to the possibility to integrate splitter assemblies in the HD splice trays, makes it possible to transform an demarcation closure into an distribution and demarcation point.

DOC - AA		
SC capability max 32		
LC capability max 64		
	Heat shrink	ANT
HD4	144	144
HD6	216	216
HD3-24	216	-

CDOC - AA		
SC capability max 9		
LC capability max 18		
	Heat shrink	ANT
HD4	48	48
HD6	72	72
HD3-24	72	-

Art. number	Ace code	Description
568205	CL-DOC-AA-NN	Demarcation optic closure with 1 oval & 6 round ports base (L=390 mm)
568209	CL-CDOC-AB-NN	Compact demarcation optic closure with 1 oval & 6 round ports base (L=380 mm)

Fibre closures

▶ *Heatshrink Sealing Kits*

ACE sealing kits consist of heat shrinkable tubing made from high performance crosslinked polyolefin coated internally with hot melt adhesive to give high mechanical and enviromental protection. When heated with a standard gas torch, or similar heat source, the tubing shrinks to follow the shape of the outlets and cables to be protected. The hot melt adhesives or sealant flows to fill any cavities or surfaces to guarantee IP68 level of protection. Every kit contains all the components to prepare and terminate all type of cables with different constructions (see kit descriptions or contact our sales office for more information).

568181

568180

568182

Art. number	ACE code	Description
568181	CL-FOC-HOS	Oval port seal heatshrink A&C closure for loose tubes cables
568180	CL-FOC-HRS	Round port seal heatshrink A&C closure for loose tubes cables
568182	CL-FOC-HRS-B	Round port seal heatshrink B closure (two port) for loose tubes cables

Additional to the standard sealing kits also pre-assembled closure kits for multi tube cables are available. Multi tube cables with 5/3,5 mm or 7/4 mm micro tubes are introduced in the closure and sealed. The micro tubes on the outside of the closure are protected with a flex tube for easy installation in an access chamber.

The water- and gastight pre-assembled closures are tested and delivered with a testing and quality report. This pre-assembled closure design is developed in close cooperation and interaction with our customers, which resulted in an easy and cost effective solution.

▶ *Mechanical Sealing Kits*
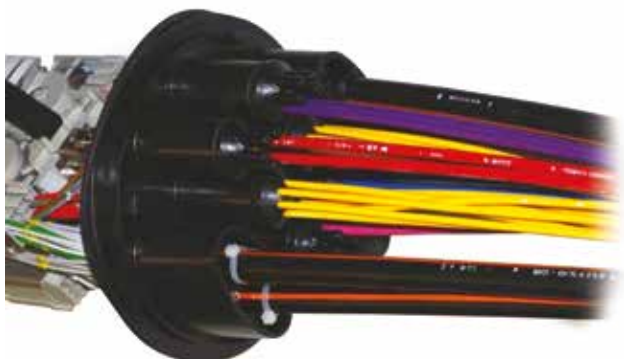
Each seal is re-accessible and allows easy and fast installation of any cable even when other cables are installed in the same port. Whatever the construction of the cable, all sealing kits allow to terminate either the aramid yarns or the strength member in order to provide a good resistance to accidental forces. Depending from the size of the cable, each sealing kit permits the entrance of one or more cables in the same port even in different sequences. The sealing (IEC529 and IP68) is guaranteed in all circumstances.

568174

568175

568176

568208

568173

568170

568177

568172

Art. number	ACE-Code	Description	Cable diameter (mm)	
			Min	Max
568174	CL-FOC-MOS-2x20	Mechanical oval seal 2 x 20 mm	10	20
568175	CL-FOC-MOS-4x10	Mechanical oval seal 4 x 10 mm	5	10
568176	CL-FOC-MRS-1x20	Mechanical round seal 1 x 20 mm	10	20
568173	CL-FOC-MRS-2x12	Mechanical round seal 2 x 12 mm	8	12
568170	CL-FOC-MRS-6x8	Mechanical round seal 6 x 8 mm	5	8
568177	CL-FOC-MRS-8x6,4	Mechanical round seal 8 x 6,4 mm	3	6,4
568172	CL-FOC-MRS-16x3	Mechanical round seal 16 x 3 mm	0	3
568208	CL-FOC-MRS-4x10	Mechanical round seal 4x10 mm	8	10

N.B.: Indicative values depending on cables construction

▶ *Closure Accessories*

TKF supplies several kits to be used together with the ACE closures for fixing or managing applications such as pole or wall mounting.


568189

568187

568260

568186

568188

Art. number	ACE code	Description
568189	CL-FOC-MB	Closure mounting bracket for mounting FOC closures on a wall or in a handhole
568187	CL-CFOC-MB	Closure mounting bracket for mounting CFOC closures on a wall or in a handhole
568186	CL-FOC-CFB	Bracket for external fixing cables and or mini-tubes (*)
568188	CL-FOC-PMB	Bracket for mounting closures on a pole (*)
568260	CL-FOC-PSK	Bracket for storing cable overlength on a pole or wall

* Always in combination with FOC-MB or CFOC-MB brackets

▶ *Street Cabinets*

The ACEcab consists of a fully assembled cabinet in a modular setup. The outer shell of the cabinet is made of reinforced polycarbonate, which is an extremely durable material. The inner construction is designed for an easy and fast installation for various applications. The modularity offers options to use plug and play splitters, patchfield with different adapters and single element or single circuit splicing.

The primary use of the ACEcab series is to form the last distribution and manipulation point in a fibre network of buried (multi tube) cables. High fibre count cables come in from the central office which are connected to the cables that run to the individual premises of a house or business. There are different cable entries available and sufficient space for clipping direct buried tubes to the backframe.
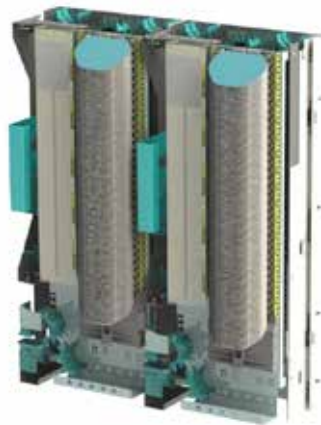
Features and applications

- Attractive modular design
- Swing frame technology for easy access
- Modular splice system for single circuit / single element
- Tube management / storage
- Plug and play splitter / splice splitter solutions
- Minimum installation time
- Secured fibre and cable routing
- Modular components in the entire housing (building blocks)
- IP54 protection

Parameter		Units	ACEcab 4 (HD)	ACEcab 8 (HD)
Dimensions	Height(*)	mm	998	998
	Width		442	754
	Depth		310	310

(*) Excl. sockel heigth above ground 400 mm

	Description				
	Splices (crimp)	Termina-tions LC / SC	No. of splitters 1:16/32/64	No. of feeder cables	No. of drop cables
ACEcab 4	1224	288 / 144	20 / 10 / 4	4	48
ACEcab 4 HD	1152	0	(*)	8	96
ACEcab 8	2448	576 / 288	40 / 20 / 8	8	96
ACEcab 8 HD	2304	0	(*)	16	192

(*) On demand, depends on configuration
Other splitter ratios on request
For other configurations please contact your TKF sales representative.
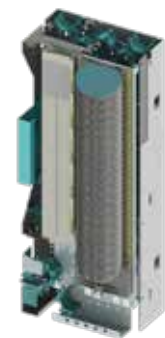
▶ *Next Generation Box*

The ACE next generation boxes are the new compact wall enclosures developed for the PON and P2P FTTH network architecture. The boxes are designed to operate in category C (controlled), category G (outdoor ground level) and category A (aerial) as characterized by IEC 61753-1, hence for indoor and outdoor applications like customer's premises, basement building, telecommunications equipment rooms, pole mountings, external wall sites etc. The protection level against water and dust is IP55. The boxes can accommodate uncut looped fibre cable and it is possible to terminate and seal different cable construction by a complete range of accessories. Versions with lock are available for improved security against unauthorized openings.

Features and applications

- Cable seal kits and accessories for easier installation
- Compatible with the most common cables types
- Cable seal kits and accessories for easier installation
- OSP Drop cable terminations for access networks
- Telecommunication enclosure for floor optical distribution
- Customized compact environmental protection

Description		
Parameters	Unit	Size
Height	mm	330
Width	mm	216
Depth	mm	125

▶ *Splice*

The splice version of the wall box is capable of accommodating the fibers of an uncut looped optical fibre cable. It is possible to terminate different cable types and constructions

Max port entries (in+out)	Splice capacity		
	HD3-24	HD6	HD4
2	144	96	96

▶ *Light Splice*

The light splice version of the box accommodates the ACE fibre management system when a cost effective spliced fibre connectivity solution is requested.

Max port entries (in+out)	Splice capacity		
	HD3-24	HD6	HD4
2	144	144	96

NB.: NGB2 light splice also alvailable with 12x SC patchpanel

ART. NUMBER	ACE CODE	DESCRIPTION
566500	TB-NGB2-LS-NN00-N	NGB2 light splice - without splice trays and lock
566501	TB-NGB2-S-NN00-N	NGB2 splice - without splice trays and lock

▶ *Demarcation Point*

The demarcation point version of the box intends to allow patching for both PON (including splitter module) and P2P architectures in FTTH deployments. The termination version allows connecting customers with a simple connector patch operation (Plug-and-Play) with SC, LC or E2000 connectors.

Max port entries (in+out)	Max fibre terminations	
	SFF	Standard
2	24	24

ART. NUMBER	ACE CODE	DESCRIPTION
566502	TB-NGB2-DP-N-N	NGB2 demarcation point - without cards and lock
566510	TB-PSC-H12-S0-12-12	Patch and splice card preloaded with 12 SC/PC pigtails and adapters
566511	TB-PSC-H12-S2-12-12	Patch and splice card preloaded with 12 SC/APC pigtails and adapters

N.B.: Above patch and splice card part numbers refer to heat shrink splice protector holders, crimp splice protector holders available on request.
Patch only cards or other configurations available on request.
For other configurations please contact your TKF sales representative

Termination boxes

▶ *Sealing kits*

Multiple wraparound cable seal kits are available using different mechanisms. Standard cable glands PG16, 21 and 29 can be installed on box (two cable entrance for box). Configuration for main cable entry (4x20 mm) and looped cables. Drop cables can be managed with push through ports (12x10 mm or 24x6 mm). Wraparound pigtail seal can be used for easy re-entry without disturbing existing circuits. Strength member of reinforced cables are fixed inside the box with the appropriate and dedicated kits.

The sealing kits can be installed on all NGB boxes. The box can also be customized with standard cable glands available within the ACE portfolio
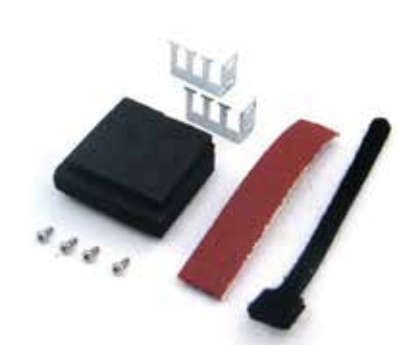
566550

566551

566552

566553

Art. number	ACE code	Description
566550	TB-NGBKIT-MCS-4x20	Multi cable seal kit 4x20 mm cables or tubes
566551	TB-NGBKIT-MCS-12x10	Multi cable seal kit 12x10 mm cables or tubes
566552	TB-NGBKIT-MCS-24x6	Multi cable seal kit 24x6 mm cables or tubes
566553	TB-NGBKIT-MCS-PB	Multi cable seal kit for patch-cord outlet

Termination boxes

▶ *ACE Customer Outlet*

566008

566007

566009

New outlets for fibre optic cabling for residential and commercial buildings. The ACE customer outlets are a complete line offering modern solutions suitable for several configuration such as multi port, splicing and hybrid. The low profile design and horizontal vertical orientation of the optical outlets offer a very clean visual appearance while protecting the cable connection with respect of minimum bend radius of the fibre.

• max. 4 fibers (566007)
• max. 8 fibers (566008)
• max. 16 fibers (566009)

These customer outlets are only for indoor use and can be mounted on a wall.

566007

566009

566008

Description		ACE customer outlet performance		
Feature		566007	566008	566009
Dimensions (lxwxh)	(mm)	130 x 80 x 25	130 x 80 x 45	130 x 80 x 45
Cable entry	rear	✓	✓	✓
	left	✓	✓	✓
	right	✓	✓	✓
	top	✓	✓	✓
Labelling		✓	✓	✓
Diameter input cable	(mm)	1.8 - 7.0	1.8 - 7.0	1.8 - 7.0
Splice capacity	ANT	4	✗	✗
	HS	4	✗	✗
Patch capacity	LC	4	8	16
	SC	2	4	8
	RJ45	✗	1	✗
Access protection		✓	✓	✓

Art. number	ACE code	Description
566007	TB-SP2-C1-02S	ACE customer outlet 2x SC; 4 splice positions + WDM position
566008	TB-SV1-C0-02T	ACE customer outlet RJ45, SC-duplex LC-quad
566009	TB-SV1-C0-08S	ACE customer outlet SC-duplex LC-quad

Termination boxes

ACE Splice Tray High Density
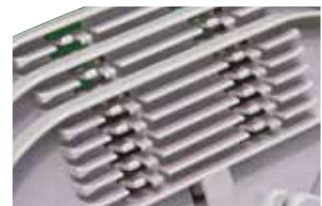
The high density splicing module (ACE-STHD) is an essential part of the ACE product range. These modules allow increased fibre capacity in any of the ACE shelves, closures and boxes, ensuring full bend radius control and total fibre management.

The module consists of a number of trays for storing and protecting splices, and a routing plate which guides the fibers in and out of the tray. The concept uses a base plate allowing more trays in the footprint, increasing fibre capacity. High quality, total modularity and ease of installation are the key factors of the ACE-STHD splice system.

Parameter	ACE-STHD
Loop-back facility	Yes
Material	ABS-PC
Flammability rating	UL-94 V0
Colour	RAL 7035

Art. Number	Module Type	Splice Tray	Pack Splice
568155 STHD-4H		12HS 6 mm	48
568154 STHD-3H		24HS 8 mm	72
568151 STHD-6H		8HS 4 mm	48
568148 STHD-2H		8HS 4 mm	16

Art. Number	Module Type	Splice Tray	Pack Splice
568143 STHD-6H/12		12HS 4 mm	72
568153 STHD-4A		12ANT 6 mm	48
568150 STHD-6A		12ANT 4 mm	72
568152 STHD-2A		12ANT 4 mm	24

▶ *PLC Splitters single mode*

Planar Lightwave Circuit (PLC) is a manufacturing process for splitters. It concerns a waveguide array that is applied to a silica chip by using a photolithographic masking process. PLC splitters are available in several types. To simplify the selection a general division can be distinguish: hard case splitters for distribution of fibre cords and small case splitters for distribution of (buffered) fibers. Both types are available in a 1 to n split ratio and an 2 to n split ratio. All splitters perform excellent in indoor and outside plant conditions.

▶ *Small Case Splitters*

Specification							
Ratio	Unit	1 x 2	1 x 4	1 x 8	1 x 16	1 x 32	1 x 64
Operating wavelength	nm	1260 - 1650					
Insertion loss	dB	≤ 3.8	≤ 7.1	≤ 10.2	≤ 13.5	≤ 16.5	≤ 20.5
Loss uniformity	dB	≤ 0.5	≤ 0.5	≤ 0.8	≤ 1.2	≤ 1.5	≤ 1.8
PDL – Polarization dependent loss	dB	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.4
Return loss	dB	≥ 55					
Directivity	dB	≥ 55					
Temperature stability -40 ~ +85 °C	dB	≤ 0.5					
Wavelength dependent loss	dB	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.8	≤ 0.8	≤ 1.0
Package dimension (l x w x h)	mm	60 x 7 x 4	60 x 7 x 4	60 x 7 x 4	60 x 12 x 4	80 x 20 x 6	100 x 40 x 6

Ratio	Unit	2 x 2	2 x 4	2 x 8	2 x 16	2 x 32	2 x 64
Operating wavelength	nm	1260 - 1650					
Insertion loss	dB	≤ 4.2	≤ 7.6	≤ 10.8	≤ 14.0	≤ 17.5	≤ 21.0
Loss uniformity	dB	≤ 0.9	≤ 1.0	≤ 1.2	≤ 1.5	≤ 1.8	≤ 2.2
PDL – Polarization dependent loss	dB	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.3	≤ 0.35	≤ 0.4
Return loss	dB	≥ 55					
Directivity	dB	≥ 55					
Temperature stability -40 ~ +85 °C	dB	≤ 0.5					
Wavelength dependent loss	dB	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.8	≤ 0.8	≤ 1.0
Package dimension (l x w x h)	mm	60 x 7 x 4	60 x 7 x 4	60 x 7 x 4	60 x 12 x 4	100 x 20 x 6	

Note: Without connector type. In case of with connector, IL will be increased about 0.25 dB for each port.

N.B.: For detailed information about the splitters please contact your TKF sales representative.

▶ *Hard Case Splitters*

The hard case splittes can be mounted in a splitter shelf. Up to 23 splitters can be housed in a 3HU splitter shelf. The splitter shelf can be mounted in a 19" frame.

For guidance of the 2.0 mm cords it is strongly recommended to add a 1HU patch-cord management panel on top and under the splitter shelf..

Specification							
Ratio	Unit	1 x 2	1 x 4	1 x 8	1 x 16	1 x 32	1 x 64
Operating wavelength	nm	1260 - 1650					
Insertion loss	dB	≤ 3.8	≤ 7.1	≤ 10.2	≤ 13.5	≤ 16.5	≤ 20.5
Loss uniformity	dB	≤ 0.4	≤ 0.6	≤ 0.8	≤ 1.2	≤ 1.5	≤ 2.0
PDL – Polarization dependent loss	dB	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.25	≤ 0.3	≤ 0.4
Return loss	dB	≥ 55					
Directivity	dB	≥ 55					
Temperature stability -40 ~ +85 °C	dB	≤ 0.5					
Wavelength dependent loss	dB	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.8	≤ 0.8	≤ 1.0
Package dimension (l x w x h)	mm	100 x 80 x 10	100 x 80 x 10	100 x 80 x 10	100 x 105 x 18	100 x 105 x 18	100 x 105 x 18

Ratio	Unit	2 x 2	2 x 4	2 x 8	2 x 16	2 x 32	2 x 64
Operating wavelength	nm	1260 - 1650					
Insertion loss	dB	≤ 4.2	≤ 7.6	≤ 11.0	≤ 14.4	≤ 17.5	≤ 21.0
Loss uniformity	dB	≤ 0.9	≤ 1.1	≤ 1.2	≤ 1.5	≤ 1.8	≤ 2.2
PDL – Polarization dependent loss	dB	≤ 0.2	≤ 0.2	≤ 0.3	≤ 0.3	≤ 0.4	≤ 0.4
Return loss	dB	≥ 55					
Directivity	dB	≥ 55					
Temperature stability -40 ~ +85 °C	dB	≤ 0.5					
Wavelength dependent loss	dB	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.8	≤ 0.8	≤ 1.0
Package dimension (l x w x h)	mm	100 x 80 x 10	100 x 80 x 10	100 x 80 x 10	100 x 105 x 18	100 x 105 x 18	100 x 105 x 18

Note: Without connector type. In case of with connector, IL will be increased about 0.25 dB for each port.

561456 - Splitter shelf 3HU 19"

561911 - Patch-cord guide panel 1HU 19"

N.B.: For detailed information about the splitters please contact your TKF sales representative.

Splitters

▶ *Pigtails*

Pigtails are optical fibre cords mostly consisting of a bare fibre with a secondary coating and terminated at one side by an optical connector. Due to its limited mechanical resistance pigtails are commonly used in a controlled environment, for example in a patch shelf or splice tray.

Description	
Cable type	Dry buffer "Easystrip"
Diameter (mm)	0.9
IL grade	IEC 61753 grade B, C
RL grade	IEC 61753 grade 1, 2
Connector type	LC/(A)PC, SC/(A)PC, E2000/APC, FC/(A)PC
Connector interface	IEC-61754
Colour	IEC 60304 / VDE 0888-3
Environmental class	U - Uncontrolled environment IEC 61753
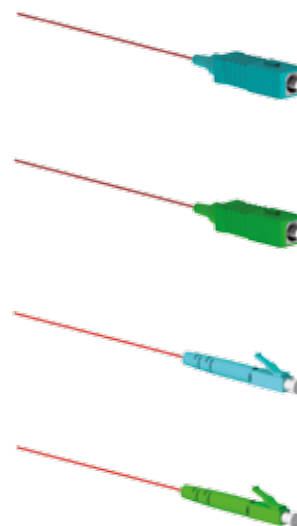
▶ *Patch-cords*

Patch-cords are optical fibre cords with a connector on both sides. The fibre cord is a dry buffered optical fibre surrounded by reinforcement (aramid yarns) and an outer sheath. Both simplex, duplex and outdoor patch-cords are available.
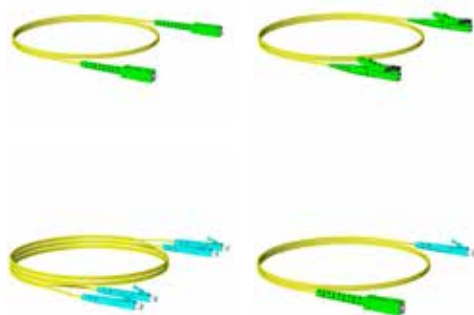
Description	
Cable type	Simplex, duplex
Diameter (mm)	1.2, 1.6, 2.0
IL grade	IEC 61753 grade B, C
RL grade	IEC 61753 grade 1, 2
Connector type	LC/(A)PC, SC/(A)PC, E2000/APC, FC/(A)PC
Connector interface	IEC-61754
Colour	Yellow
Environmental class	U - Uncontrolled environment IEC 61753

▶ *Adapters*

Adapters are coupling and alignment components for 2 or more fibre optic connectors. The adapters are classified by type, configuration, coupling mechanism and style. In most cases the adapters are part of a patch shelf or termination box.
The ACE adapters stand out due to the unique "one-piece" housing which guarentees a high quality and stable fibre optic connection. Different configurations are available, e.g. simplex, duplex, quad, with or without flange etc.

N.B.: For the different pigtail, patch-cord and adapter types please contact your TKF sales representative.

Pigtails, patch-cords and adapters

▶ *Cable Assemblies*

TKF offers a wide range of pre-connected cables, cables provided with any given optical connectors.
Smart fan-out solutions together with a cunning packaging have been developed to achieve a product that allows a fast, reliable and convenient installation process.
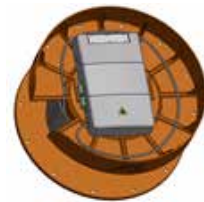
Pre-connected fibre optic modules

Pre-connected cables

Pre-connected MDIC "Rapid roll"

Pre-connected DAC "Home run"

Pre-connected hybrid cable

Features and applications

• Homerun and Rapid roll solutions make fast and easy installation at the customer premises possible

• Connectors are mounted directly on the fibre without splicing

• Fan-out modules are equipped with 0.9 mm or 1.8 mm protective tubing

• Pre-connected SFU can be blown directly out of the packaging (blister)

• The cable assemblies can be combined with different ACE boxes or trays

• Individual retention of every tube in the Fan-out module guarantees a secure installation

N.B.: For detailed information about the cable assemblies please contact your TKF sales representative.

▶ *House Entry Kit*

The ACE house entry kit is suitable for above ground and buried applications on walls following DIN 18195-4. The set includes all components for both installation options.

Tubes and cables from 2 - 14 mm can be inserted. Maximum wall thickness up to 600 mm. The duct has a diameter of 20 mm, which requires a drilling of only 25 mm.

Gas-block connectors can be inserted in the housing.

| Buried application

Features and applications

- Easy and fast installation
- Uniform solution above ground and buried
- Watertight following DIN 18195-4
- Suitable for duct and cable diameters 2 - 14 mm
- Gas-block connectors up to 14 mm can be inserted
- One kit for above ground and buried applications
- Small drillhole max. 25 mm
- Click lock with seal
- No additional tooling needed

| Above ground application

Art. number	ACE code	Description
568930	MC-HE-01	House entry kit II including expansion resin

▶ *Heat shrink Splice Protector*

The heat shrink splice protector provides mechanical and environmental protection of fusion splices. The splice protector consists of a transparant shrinkable tube which contains meltable adhesive to encapsulate the splice. The stainless steel rod ensures a proper alignment and rigidity which protects the splice against mechanical damage and moisture.

Features and applications

- Shrinkable temperature of the sleeve approx. 115°C to 125°C

- Melting point of the adhesive approx. 75°C to 85°C

- Hardness of metal pin > 400VH

- Bellcore GR-1380 compliant

- RoHS compliant

- Full length strength member for total fibre support

- Close dimensional tolerances

- Fast shrink time

Art. number	ACE code	Description
401395	AC-SPH1	Heat shrink splice protector Ø 2.6 mm l:45 mm (100 pcs)
401396	AC-SPH4	Mini heat shrink splice protector Ø 1.0 mm l:30 mm (100 pcs)

▶ *Crimp Splice Protector (ANT)*

The unprotected splice is embedded in the durable plastic compound, thus protecting it from environmental impacts. The splice protection consists of a single-part V-shaped metal base coated on both sides with a durable plastic compound. The fibre-optic splice is mounted centrally in the splice protection after splicing and closed precisely by means of a splice protector press.

Features and applications

- Maximum diameter of primary coated fibre 250 µm

- Storage temperature -30°C to +60°C

- Processing temperature -5°C to +45°C

Art. number	ACE code	Description
401306	AC-SPA1	ANT splice protector (150 pcs)
401334	AC-TOSP	Splice protector press

Consumables

▶ *Cleaner pen*

The ACE portfolio is enhanced with high performance tools to clean the ferrule end face of an optical connector. Two versions are available. Cleaner pen for ferrule end face Ø 1.25 mm and a cleaner pen for ferrule end face Ø 2.50 mm.

The cleaner pen allows an one-step cleaning action directly at the PC and APC ferrule as well as through an adapter.

ART. NUMBER	ACE CODE	DESCRIPTION
430160	AC-TOCP-125	Cleaner pen Ø 1.25 mm LC / MU adapter and connector
430161	AC-TOCP-250	Cleaner pen Ø 2.50 mm SC / FC / ST adapter and connector

▶ *Support*

The ACE concept is mainly a success of people. People with knowledge and skills concentrated in the ACE team. Together with our customers we share this technical knowledge and new developments.

Engineering

Already before the start of a project we offer our support in the engineering and decision making phase. Our engineers make use of software suitable for designing fibre optical networks based on your local circumstances even before you have taken one step in the field. Combined with a budged calculation the actual figures from the engineering will support you in making a rational and well-founded decision in building a network.

Based on the complete ACE cable and connectivity portfolio we are able to convert the engineering data directly into an existing, well-connected network which gives you the advantage of using first-hand information. This will not only support your own business case, but will also help you to convince investors, local governments etc.

Training

To prevent uncertainties or faulty installation we share our knowledge about cables and connectivity by offering training modules at project start.
By means of training the installer can get acquainted with the ACE cables, components and tools before starting in the field. This will help the installer in getting up to speed more easy which contributes to the often tight project planning, without losing grip on the quality. The different modules in the training course can be divided in Civil Works, Components, Fibre Optic and Cable Blowing.

Training 1 Civil Works
The civil works module is a theoretical training in laying and installation of cables, ducts, multi tube cables, connectors etc. Training subjects are: installation of ducts and cables using the right bend radii, how to make a correct tube connection, which tool to use etc.

Training 2 Components
In the components module both theoretical and practice training for installation of components and stripping of cables are covered. The training can be a general training concerning different ACE components or tailored made for specific projects or customers.

Training 3 Fibre Optic
The fibre optic module contains the following theoretical and practice subjects: basics of fibre optic, fibre splicing, OTDR / power measurement and interfero measurement in clean room environment. Based on customer requests and existing knowledge of the participants, training will take 1 to 3 days.

Training 4 Cable blowing
During this training TKF will share its long-term cable blowing experience with its participants. The module consists of cable blowing demonstrations and in depth multi-day training sessions.

Supply chain solutions & logistics

An essential part in the successful roll out of a project is the in time supply of the materials at the right location. The installer needs to be able to focus on his core business without concern regarding delivery of materials. TKF has implemented the TOC "Theory of Constraint" methodology for many years. TOC Replenishment in accordance with the engineering and forecast information from the customer is the key to a reliable supply chain.

Combined with the Logistical Services which TKF offers, we are capable to restock automatically according pre-arranged parameters in your warehouse or on project location. This VMI "Vendor Managed Inventory" concept will not only guarantee a constant stock level but will also reduce your operational costs due to lower stock levels, less communication and less transport between the customer warehouse and project location.

Field support

During the build of a fibre optic network it is important to keep in close contact with the project manager as well as the installers in the field. The extensive knowledge of our field support engineers combined with the skills of the installer will guarantee a successful roll out of the network.

Quality control & complaint monitoring

Within the TKF organisation there is a high quality standard for the production and handling of cables and components. When however there are issues which require extra attention the TKF quality department in combination with the field support engineers will always monitor and solve the complaints in close cooperation with the customer. This dedication within the entire TKF organisation has proven to be a solid base for satisfied customer relations over the last decades.

▶ TKF Technological Leadership in connectivity solutions

Since the establishment in 1930 TKF developed from a cable producer to a leading supplier of connectivity solutions located in the Netherlands. A broad range of cables, systems and services enables us to provide our customers worldwide with safe and reliable power and data connections.

Due to a focused commitment TKF is distinguished by specialized application knowledge and solutions with a high degree of reliability, quality and service. Specialized technical know-how and flexibility lead to a high return on investment for our customers.

TKF is characterized by continuous investment in customer relations, quality and supplementary services, resulting in sustainable cable solutions and long-term and successful relationships.

It goes without saying that we offer our customized solutions with respect for people and environment. Being part of the technology company TKH Group NV, TKF has access to breakthrough solutions, concepts and technologies.

More than 85 years of experience

▶ Meet the TKH Group and its core technologies

TKH Group NV (TKH) is an internationally operating group of companies specialized in creating and supplying innovative Telecom, Building and Industrial Solutions.

All TKH technologies are interlinked into total solutions for these three business segments. Specialists in the fields of marketing, process development, design, engineering and logistics add advice and project implementation to offer a tailor-made solution. TKH aims to carve out strong market positions based mainly on its own advanced technologies and services and on its strong regional and international positioning.

The group's growth is concentrated in north-western, central and eastern Europe and in Asia. TKH is known for its innovations and its commitment to renewal. The urge to lead is great. TKH places its experience and knowledge into the service of its clients, and jointly looks for optimal solutions.

The four TKH core technologies:
Vision & Security | Communications | Connectivity | Manufacturing Systems

TKF Finland

TKF Sweden

TKF headquarters

C&C Partners

TKF GmbH

TKF SAS

www.ace-fibreoptic.com

ACE is an initiative of · member of the TKH Group