

# Professional Applications

## *A report about the application of van den Hul products in the professional world*

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## 1: The material properties of van den Hul cables

1. Thanks to the use of HULLIFLEX<sup>®</sup> as our standard cable jacket material, all our cables are free of ageing. Effectively blocking the penetration of corrosive environmental chemicals and gases (unlike the commonly used PVC), HULLIFLEX<sup>®</sup> doesn't contain any plasticizers, the negative effects of which on the cable's conductors and their irritating smell therefore are non-existent.
2. Since our HULLIFLEX<sup>®</sup> insulation material does not have any electrical dipoles, there are also direct advantages to the sound quality: negligible microphony and dielectric absorption.
3. The metal conductors used in the majority of our copper based cables are made of the highest grade Oxygen Free Copper in a multi-strand construction. This to avoid metal fatigue problems in applications subject to frequent movement.
4. In the greatest number of our cables the metal strands are equipped with a dense silver coating. This dense silver coating especially protects the sensitive copper conductors against ageing and chemical deterioration.
5. The silver coating is applied under very precisely controlled conditions to avoid the inclusion of any chemical residues and the resulting chemical degeneration of the underlying copper, as standardly found with the regular electroplating processes.
6. Some of our very best cable types are equipped with conductors completely made of Linear Structured Carbon<sup>®</sup> (LSC). An ideal material for signal transfer because of its non-metallic composition and everlasting properties. LSC is extremely robust, insensitive to bending and immune to chemical corrosion: no more corruption of the sound quality due to mechanical ageing or chemical decline.
7. One of our newest metal technologies, named "Fusion Technology", provides a very stable conductor with a quality and durability which surpass those of common copper by a great extent.
8. Thanks to all advanced ingredients, the longevity of our cable products in critical environments and applications by far exceeds that of regular products and ranks among the best available on the cable market.

## 2: The product properties of van den Hul cables

1. Based on our audiophile product design and evaluation, any professional application of our cable products perfectly matches with the highest possible requirements of the serious high-end audio lover.
2. Our cables are produced in Western Europe. We use the best manufacturing facilities available to guarantee an absolute and constant product quality.
3. Because of our specific interest in the high quality construction of all our cable products, their properties are very predictable and stable. The quality of reordered products is exactly the same, without any hidden surprises.
4. Our cable confection is done in-house by highly skilled people using the finest of equipment (like very high quality stripping machines). All our ready-made end products are furthermore fully tested. We therefore guarantee constant high quality and reliability. No broken strands, bad soldering, bad contacts or insulation problems.
5. Due to their multi-strand conductor design, our cable products are very flexible. They are easy to handle and work with in the dynamic recording and studio environment.
6. With their high quality and reliability, Neutrik brand XLR connectors are a worldwide accepted professional standard. We therefore exclusively terminate our balanced cable products with Neutrik XLRs.
7. All our cable products are designed to provide an extended frequency transmission range. A bandwidth which far exceeds their specific application area's technically required limits.
8. The ever increasing abundance of wireless equipment and other high frequency noise sources poses a growing threat of interference on signals carried by cabling and equipment. In our cable designs we pay very much attention to this aspect; All our professional cable products are equipped with multiple shields to effectively block all interference.
9. Multiple shielding is also very useful in situations where a variety of long cables are run in parallel (e.g. in cable conduits). Our professional cable products' very high shielding factor provides significantly reduced crosstalk levels, thus ensuring crisp, clear and undistorted signal transmission in both the analog and digital domain.
10. Cable impedance-deviation caused signal reflections and related digital-domain jitter are highly unwelcome in professional applications. Our high manufacturing quality video, SPDIF and AES/EBU cables' 75 resp. 110 Ohm characteristic impedance is a stable and close tolerance parameter. Not just a value somewhere around the required

impedance.

11. To serve even the most demanding and critical applications, our 'Hybrid' cable designs are consistently equipped with our Linear Structured Carbon<sup>®</sup> (LSC) conductive material. A material which inclusion provides a significant contribution to the overall cable quality and performance.

LSC has four major advantages:

Signal fidelity:	Conductors equipped with LSC are characterized by their lack of sound harshness and their preservation of resolution, ambience and definition; A much more natural, open and nonfatiguing sound in comparison to designs without LSC.
Noise immunity:	Applied as an extra layer in our 'Hybrid' cables' shields, LSC's excellent high frequency interference absorption properties significantly improve the shielding factor and noise immunity.
Very low microphony:	The cable's conductive LSC layers effectively prevent static electrical charges to arise from cable movements or other dynamic stresses.
Reliability:	In our 'Hybrid' cables, the high-density LSC layer surrounding all metal conductors provides extra protection against mechanical aging and chemical corrosion.

### 3: Our professional products and the professional industry

There are many different reasons why we have such an extended professional product program.

The main reason is the regular request for special products which we receive from recording studios (like Polygram and Polyhymnia, the (former) BOP studios in South Africa or the David Gilmore studios in London on behalf of Pink Floyd). In addition, the mixing console industry (like Neve, Focusrite and Solid State Logic) and other audio equipment manufacturers (like e.g. Meridian, SME and Graaf) also played their role.

Our products are especially also in favour with loudspeaker manufacturers. On a very regular base we supply e.g. Sonus Faber and many other bigger and smaller companies.

Another clear reason for extending our professional program was the fact that we saw poorly designed products being used in the industry. Products and applications for which we had much better ideas and solutions. Thus our program continually expanded with many other new designs.

During our company's more than 25 years of existence we have gained rich experience and expertise in the field of cable design regarding signal quality and product durability (especially under tropical conditions). But also in many other related fields like, solderability (e.g. no retraction of the insulation during soldering), damage free stripping and specific adaptations to manufacturers' requirements in design and electrical and mechanical properties.

This knowledge has allowed us to develop an unique product collection. A collection of outstanding quality and performance, perfectly matched for the professional market.

### 4: Van den Hul professional products in several categories

#### Equipment internal balanced wiring:

For balanced signal wiring inside mixing consoles and other equipment we advise our small diameter FLEXICON B4 (Ø 3.7 mm), The PATCHBAY B5 (Ø 5.0 mm), D - 501 HYBRID (Ø 4.5 mm) and D - 501 SILVER HYBRID (Ø 4.0 mm). Despite their small diameter all have a good to very good shielding factor.

#### Signal patching and equipment interconnection:

For patchbay connections, we advise our The PATCHBAY B5 which has especially been designed for this purpose. This balanced 5.0 mm diameter cable is flexible, mechanically very strong, has a very good shielding and provides a superior sound quality.

For equipment interconnect and signal patching applications where somewhat less flexible and thicker cabling is admissible, we furthermore advise our world-famous D - 102 III HYBRID and The INTEGRATION HYBRID. Both these balanced cables are triple screened to provide maximum crosstalk rejection and noise immunity, especially when longer distances are to be bridged.

#### Microphone cables:

Microphone cables are a class in itself and all technicians have their own specific ideas about the related requirements.

To uncover and study all possible necessities, our company asked 26 different recording technicians and engineers about

their thoughts on this “hot” subject.

To our big surprise we likewise ended up with 26 different requisites. Amongst these were the needs for:

- Supreme audio signal transfer quality
- The ability to transfer 110 Ohm impedance AES/EBU digital audio
- Multiple shielding with excellent immunity against high frequency interference, like from mobile telephones
- Very low microphony
- Low conductor resistance
- Low parasitic cable capacitance
- Thinness and flexibility
- Easy stripping and soldering
- Impenetrability to humidity, water and gases
- Resistance against influence of chemicals
- High mechanical strength and robustness with:
  - Mechanical reinforcement allowing to withstand 50 kg (110 lb) weighing loads
  - A cable jacket so strong that it can stand a slamming church door
- The ability to pass on 200 Volt DC to bias special condenser microphones
- Of course, 3 internal conductors and 10 more properties...

Based on all these requirements we succeeded in creating the right product: Our The MIC HYBRID, incorporating all.

Our cable program also provides more simple, yet high quality solutions, like our triple shielded, twin internal conductor D - 102 III HYBRID. We have recently sold 350 km of this cable to a big studio in the Far East, where it's also in use as microphone cable.

#### **Microphone multicables:**

In case of multi-channel applications with the strict requirement of no crosstalk between the channels, we advise our The BIG MIC. A multicable with 8 lines, each having three conductors and being double shielded.

#### **SPDIF digital audio interconnects:**

Coaxial digital cables are always 75 Ohm. This is an iron law and the standard worldwide.

Our program carries a wide variation in cable products suitable for SPDIF digital audio transfer, all having three specific properties: coaxial, a 75 Ohm characteristic impedance and an extended frequency range. These are our The NAME, The VIDEOLINE 75, The VIDEOLINK 75, The TRIAXIAL Professional 75 Ohm, The DIGI-COUPLER 75 Ohm and The MC - SILVER IT Mk II 75 Ohm.

Especially designed for SPDIF transfer in the most demanding professional applications, our The DIGI-COUPLER 75 Ohm provides exceptional performance. This amongst others due to its 7 layered shielding with an impressive screening attenuation figure of 120 dB at 1 GHz and 78 dB at 3 GHz.

#### **AES/EBU digital audio interconnects:**

Balanced digital cables are always 110 Ohm, a worldwide standard set by the AES/EBU committee.

Specially designed for AES/EBU signal transfer, our program carries The AES-EBU 110 Ohm Professional, a high quality product at a very affordable price. Furthermore suitable is our THUNDERLINE HYBRID.

To provide the highest possible reliability, our AES/EBU digital audio interconnects are fit with the special Neutrik XCC type digital audio XLR connectors.

#### **Fiber optic digital audio interconnects:**

When extreme noise immunity is aimed at, digital information transfer by means of light is the choice.

For this purpose we carry The OPTOCOUPLER Mk II, an optical fiber interconnect providing high bandwidth, low-loss and low jitter.

#### **AC power cables:**

The complex professional work environment (like studios) is blessed with a multitude of mains power connections. Not only do they all carry high frequency (HF) noise as present on the mains, but they also radiate and pick up such noise. To effectively deal with all related interference problems we have come out with a special AC power cable range, containing: The MAINSSTREAM HYBRID, The MAINSSTREAM BS HYBRID and for lower power applications: The MAINSSERVER HYBRID.

All cables in this range are heavy shielded, but moreover, they also perform as a powerful HF filter between the equipment and the mains. In the same manner, HF noise transfer between (digital) equipment is reduced dramatically. To keep equipment free from spurious signal penetration along their mains connections, all three of our The Mainsstream series' power cables come highly recommended!

### **Video cables:**

In professional setups it is common to have mixed-mode operation with audio and video equipment working together. Serving video applications, our program carries a broad range of cables. A few of which standing out for professional use are our:

- The TRIAXIAL Professional 75 Ohm, the studio standard for high quality video connections.
- The S-VHS-2-75, a twin coax for S-VHS / S-Video connections.
- The COMPOLINE 75, a triple coax for 3 component video connections ranging up 5 meters.
- The COMPOLINK 75, a triple coax for longer range 3 component video connections.
- The RGB-5-75, a quintuple coax for HDTV (RGBHV) video connections.
- The SCART, for SCART AV connections and
- The VDH HDMI and The VDH HDMI HQ HYBRID, for HDMI™ standard digital AV connections.

### **Ground system wiring:**

In studios with all their complex equipment interconnections it is essential to have a good equipment grounding system. Per studio we advise to use star configured grounding with minimally four grounding electrode sunk around the complex. These four electrodes are connected to a central ground bar made of very high quality copper with multiple connections to all studios and equipment (\*). Highly suitable for all related ground wiring of various diameters are our special quality SCS - 2, SCS - 4 and SCS - 6 (AWG 2, 4 and 6) wire types.

(\* Reference: *K.R. Fause. Fundamentals of Grounding, Shielding and Interconnection. Journal of the Audio Engineering Society, Vol. 43, No. 6, June 1995, p. 498-516.*)

### **Mains power conditioning:**

Next to using high quality power cabling and having a good ground system, studio equipment should not be directly connected to the local mains network, but to a separately derived, controlled AC power source. This allows to create a clean/technical ground, avoids mains DC components and high frequency noise injection and also allows to stabilize the mains voltage. It is therefore essential to install a power isolation transformer (or generator) which provides separation from the locally supplied power system.

To support controlled studio mains power, we have 500 and 1000 VA power stabilizing (constant voltage) isolation transformers in our program. Both provide a pure 50 Hz sine wave with very low harmonic distortion and a very well controlled output voltage.

### **Power amplifiers:**

We also supply analog and digital power amplifiers in a wide range of output powers. Most of them are provided with balanced inputs and are suitable for mounting in 19" racks or stand-alone application.

In the design and test stage of our amplifiers the reliability and durability of the circuitry receives the highest attention. As an example, the former BOP studios in South Africa have used our VDH 500/1000 type amplifiers for 14 years without noteworthy problems.

In case you may even need clean 3500 Watt audio power, we can also meet each other (with earplugs please).

## **5: Our custom design services and support**

Specialized in the design and manufacturing of specialty products, like for instance complex cable constructions, our company has more than 25 years of theoretical, technical and practical experience.

All custom designs we make are without any extra cost for your company and their manufacturing is done by the same professional companies which we also use for our own production. Furthermore, by making bigger productions, the price is always interesting; Professional cable productions e.g. never require lengths of 80 cm or 1 meter. We deliver these specialty productions on reels of 500 meter up to even 1 km. The customer cuts the desired lengths himself. This saves inefficient rest lengths.

The professional world is a complex of players with plenty of friends and even more enemies.

To be a serious player, it is very important to have the most valuable relation with the leading technicians and the key buyers. And it's a must to know your own product program till the last full stop. Without knowledge, the story is lost even without having seen the first page of the book.

The van den Hul company provides a strong backing for its representatives in technical seminars and negotiations. Based on years of experience, we speak the language of leading technicians and key buyers, which is of great help when having to work out a serious offer.

## 6: Conclusion

We regard our company as a serious player in the world of professional cable manufacturers. The great number of creative and technical solutions we have realized in the past form a rigid platform for new developments in the future.

***When you are in demand for special cable or other professional solutions we would be glad to share our ideas!***

A.J. van den Hul

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