

## Big stranding machinery

**NIEHOFF is expanding its activities into larger rotating equipment for stranding wires and cables with bigger cross sections.**

NIEHOFF has been active in designing and building rotating machines for the cable industry since the 1960s. Typical machines resulting from this continuous development are the industrially proven double twist stranding machines of the D and DSI series. In order to enable NIEHOFF customers the production of energy cables with even larger dimensions, NIEHOFF started in 2017 the development of three further D series machines for spool sizes up to 2000 m as well as rigid stranders. The design of these machines is carried out through a collaboration between the engineers of NST (NIEHOFF Stranding Technology S.L.) and the engineers at NIEHOFF's headquarters in Schwabach (NSC). The specialists of both teams have extensive experience in the design of rotating machines for the cable production.

### New D type double twist stranders

Until recently, the D series of double twist bunching and stranding machines comprised seven differently sized models built in right-hand or left-hand version. The biggest model of them has been the D 1251 type version with a pulling force of 12 kN.

The new double twist stranding machines of the D series with the designations D 1252, D 1602 and D 2002 are mainly foreseen for the manufacture of compacted conductors for energy cables with 6 mm<sup>2</sup> to 500 mm<sup>2</sup> cross sections. The first machine which has been designed is the D 1252 model which will be built in 2018 and adapted to more respective areas of application than the D 1251 model. Both machines are foreseen for conductors with a 7 wire design, for example 7 x 3.05 mm, but the D 1252 is designed for up to 19 wires too. The D 1602, the next larger model, will be intended for conductors with a 19 wire design, and the D 2002 for all designs beyond (Fig. 1). In parallel to this development, the peripheral machinery is going to be developed.



### Characteristics of all D type machines

Like all machines of the D series, also the new D type machines feature the service proven energy-saving single bow design and are equipped with an energy-class IE3 energy saving rotor drive and an adjustable fan drive in the sound proof cabin.

A smooth conductor treatment is ensured by the fact that all pulleys and capstans have big diameters. The automatic traverse is equipped with a flange detection system allowing spools to be perfectly spooled. Even at high speeds, spooled cables can be payed-off tangle-free and with no damage. Several sensors monitor the quality of the production process. Due to the design, there is a straight conductor path from the second twist pulley to the capstan enhancing the quality of the cables which can be compacted via a motorized closing/compacting die with cable lubrication.

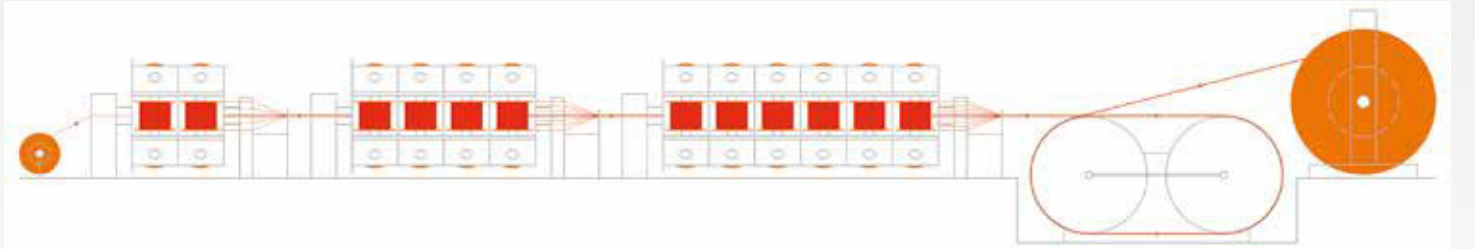
For all range of machines the working height is 1300 mm. Also the new D type machines are operated using a network-compatible Human Machine Interface (HMI) color touchscreen monitor called NMI (NIEHOFF Machine Interface).

### NIEHOFF rigid stranders (NRS)

While stranding in unilay construction can be realized in most cases by a double twist strander, other concentric constructions, which normally involve more wires, require machines such as rigid stranders. These machines are used for the manufacture of concentric cable constructions such as 1+6+12+18+24+... allowing cross lay formations. The machines consist of several cages which contain a certain number of radially disposed bobbins (6, 12, 18, 24 ...). The maximum number of wires determines the configuration of the line. For example:

- 3 Cages (6+12+18) for up to 37 wires,
- 4 Cages (6+12+18+24) for up to 61 wires,
- 5 Cages (6+12+18+24+30) for up to 91 wires,
- 6 Cages (6+12+18+24+30+36) for up to 127 wires.

The most demanded configuration on the market is the rigid strander for 61 (Fig. 2) wires followed at big distance by the 37 wires configuration.



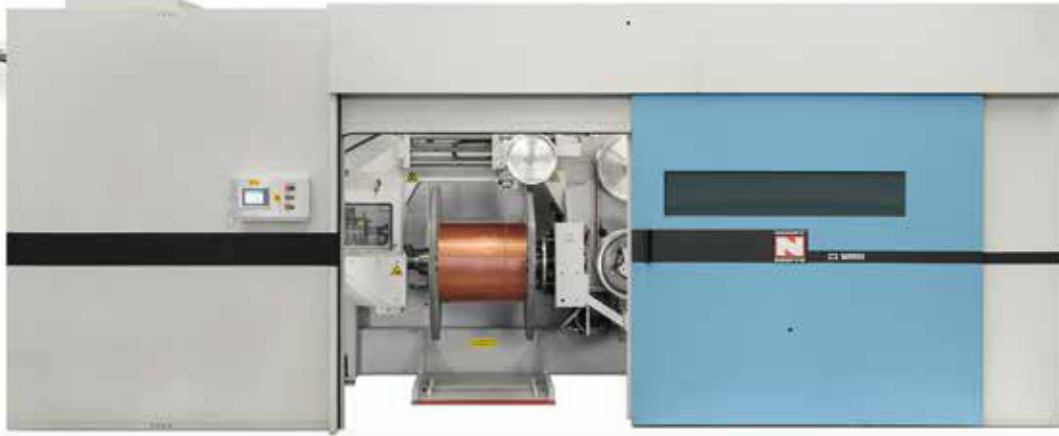
Al, Tek tel çapı	1,5 - 5,0 mm
Cu, Tek tel çapı	1,2 - 4,5 mm
Maks. bükümlü iletken kesiti	1200 mm
Maks. kablo çapı	45 mm
Hatve boyu	60 - 900mm
Önbükümlü hatve boyu	1000 - 2500mm
Maks. üretim hızı	75 m/dak
61 telli rijit büküm hattının teknik özellikleri	

The most demanded configuration on the market is the rigid strander for 61 (Fig. 2) wires followed at big distance by the 37 wires configuration. Each cage rotates on its axis independently from the other cages in speed and direction. The bobbins are held by pintles allowing the unwinding rotation. The bobbin sizes are normally 630 mm. A big pulling capstan is in charge of pulling the stranded conductors, a static take up is winding the conductor.

### Applications

Rigid stranders can be used for the manufacture of a wide range of cables such as round stranded, round compacted, round with trapezoidal wires, round with Z shaped wires, straight sector shaped, prespiralled or ACSR conductors. The machines can be used also for laying up control cables and applying a screening with Cu or Al wires.

Our capstan power opens a new range of possibilities. Sector-shaped conductors with a cross section of up to 120 mm<sup>2</sup> with D1252!



Yarı rijit iletken (Class 2)		D 1252		D 1602		D 2002	
Tek tel çapı (Al & Cu)	mm	1,0 - 3,2		1,5 - 4,8		1,5 - 4,8	
		Cu	Al	Cu	Al	Cu	Al
Bükülü / sıkıştırılmış	mm <sup>2</sup>	6 - 95	6 - 120	16 - 150	16 - 150	16 - 400	16 - 500
Yuvarlak kompaktlanmış	mm <sup>2</sup>	6 - 70	6 - 120	16 - 150	16 - 150	16 - 300	16 - 400
Sektör kesitli	mm <sup>2</sup>	6 - 70	6 - 95	16 - 120	16 - 150	16 - 150	16 - 150
Sert Cu & Al alaşım (Class 2)							
Bükülü (7 tel)	mm <sup>2</sup>	6 - 54,6		6 - 54,6		-	
Sektör kesitli	mm <sup>2</sup>	6 - 70	6 - 95	16 - 120	16 - 150	16 - 150	16 - 150
Esnek iletken (Class 5 & 6)							
Cu & Al tel/demet	mm <sup>2</sup>	6 - 120		6 - 240		6 - 400	
İzoleli damar							
Min. iletken (toplam)	mm <sup>2</sup>	4		10		-	
Maks. tek iletken							
Class 5 & 6	mm <sup>2</sup>	35		35		-	
Class 2	mm <sup>2</sup>	25		25		-	
Class 1	mm <sup>2</sup>	6		6		-	
Maks. iletken sayısı	AG	7		7			
	Sinyalizasyon	19		19			
Maks. kablo çapı	mm	25		30			

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