ISSN 1983-4764

VCC® VERTICAL COMPACT COILING TECHNOLOGY

VCC® THE MOST ADVANCED SOLUTION TO FEED AUTOMATIC CUT AND BENDING MACHINES WITH REBARS CA 50 OR CA 60[1]

Filippo Verleza[2]
Delio Amorim[3]

Abstract

The VCC® line is the state-of-the-art of Hot Spooling Technology for rebar CA50 or CA60. Nowadays the cold processing market requires stable/compact and easy to process coils; many conventional plants with Wire Rod Blocks and Laying Heads are more and more often required to recoil their hot rolled coils into spools. This operation takes time and, therefore, money. VCC technology is giving the possibility of producing “as-recoiled” compact coils directly on line. This product is very suitable for modern bending machines or high speed straightening lines to straighten and cut-to-length the spool and sell the bars by number and by length. Furthermore, this spool can well serve an automatic electrowelded mesh plant or the cut and bending automatic lines.

Key words: VCC technology; Spooling line; Spooler; Long products rolling mills**.**

VCC® TECNOLOGIA DE PRODUÇÃO DE BOBINA COMPACTA TIPO CARRETEL

VCC® A SOLUÇÃO MAIS AVANÇADA PARA PARA ALIMENTAR LINHAS AUTOMÁTICAS DE CORTE E DOBRA COM BARRAS CA50 OU CA60

Resumo

A linha VCC® é a tecnologia estado-da-arte para produção de bobinas compactas tipo carretel de barras CA50 e CA60. Hoje em dia o mercado requer cada dia mais bobinas mais estáveis e compactas para facilitar o processamento das mesmas nas linhas de processo a frio. A cada dia que passa muitas plantas convencionais com configuração bloco e formador de espiras estão sendo mais solicitadas a oferecer seus produtos em carretéis e gerando assim a necessidade de um rebobinamento de suas bobinas a quente. Este tipo de operação demanda tempo e, sobretudo, dinheiro. A tecnologia VCC dá a possibilidade de se obter esta bobina compacta em forma de carretel diretamente da linha de laminação. Este produto se adequa muito bem para o processamento futuro como nas linhas de dobra ou endireitamento de altas velocidades que endireitam e cortam a medida barras que são vendidas ao mercado por quantidade ou comprimento. Além do mais estes carreteis podem alimentar muito bem linhas automáticas de corte e dobra ou mesmo na produção de telas eletro-soldadas.

Palavras-chave: Tecnologia VCC®; Linha de produção de bobinas carretel; Bobinas em carretel; Laminadores de laminação de aços longos.

[1] *Technical contribution to the 48th Rolling Seminar – Processes, Rolled and Coated Products, October, 24th-27th, 2011, Santos, SP, Brazil.*
[2] *Regional Sales Manager, Long Product Rolling Mills, SMS Meer Spa.*
[3] *Sales Manager, SMS Meer Brasil.*

ISSN 1983-4764

1 INTRODUCTION

SMS Meer's Vertical Compact Coiler line (VCC®) is today's solution for obtaining a compact coil in line in a rebar rolling mill.
The VCC® system is the new method , worldwide recognized, to produce very high density coils to be processed directly in the cut and bending machines (meshes, drawing and lattice girder frame Lines).
Before the birth of the VCC® technology a great deal of drawn stream processes were required using as raw material the coils produced in conventional wire rod lines.
By this new system, is possible to avoid the former downstream process, cutting costs as well saving time.
This machine concept fulfils the best criteria in modern mechanical engineering for rolling mill applications: heavy-duty service factor, focus on maintenance minimization, ease of erection and startup, safety features and particular attention to the demands of the process.

2 METHODS AND MATERIALS

The VCC® Vertical Compact Coiler line has the following general characteristics:
Capability to process plain rounds dia. 8 mm to 32 mm, rebars dia. 6.3 mm to 32 mm as well as flats, squares and hexagons.

- coil weight: up to 3.5 t
- rebar CA50 or CA60
- design speed: up to 40 m/s
- indicative coil dimensions:
- inside diameter 700 mm or 850 mm,
- height 700 mm or 800 mm.

Advantages of the coiler are:

- compact and good coil geometry
- very high material density up 80% (wire rod coil is in the range of 30%)
- heavy coil weight Torsion-free coiling (no axial torsion)
- high productivity, with the possibility of installing the system downstream of two rolling strands or slitting rolling mills.

By this new technology the out of line re-coiling machine are not any more necessary.

ISSN 1983-4764

Figure 1. Entry section of compact coiling system.

2.1 The Advantage Having a Vertical Machine Arrangement

There are several advantages in the formation of coil in vertical position.
Comparing the SMS Meer solution with others supplier, using horizontal formation of the coil, is easy to understand the several benefits.
Benefits include avoiding the need for turning manipulators but, more importantly, the savings in process cycle time because coils are already formed in their natural final position. The coils are ready to be delivered to storage immediately after coiling and cooling. The limited amount of handling minimizes the overall risk of damage
All the machines for coil formation are over +/- 0 mm level, with big benefits for foundation costs and maintenance operation, this is also a consequence of the vertical solution.
The mechanical and electrical equipment is simpler, thank to the fact that a second support for coil formation is not necessary. This second support is absolutely necessary with horizontal machines.

ISSN 1983-4764

Figure 2. Vertical coiler arrangement.

3 RESULTS

3.1 The Compact Coil

A crucial step forward in improving the quality of the pack up of the final product is the compact coil.
These coils have pre-selected dimensions that, thanks to the VCC®, are constant for all the products processed out of the same line. Needless to say the compact shape of the coil makes it ideal for storage, transport and handling.
Such advantages are even more appreciable when coils are reworked next to the construction site where rebar stirrup and other concrete reinforcing structures are built, particularly in metropolitan areas with their major space constraints.
The hot rolled condition of the compact coil makes it suitable for direct cold working with high ductility during elastic deformation and low energy demand for final forming.
The geometry assures smooth de-coiling during the downstream process.
The coil weight significantly contributes to reducing the time for downstream coil changing and to the enhancement of the yield due to minimal losses.

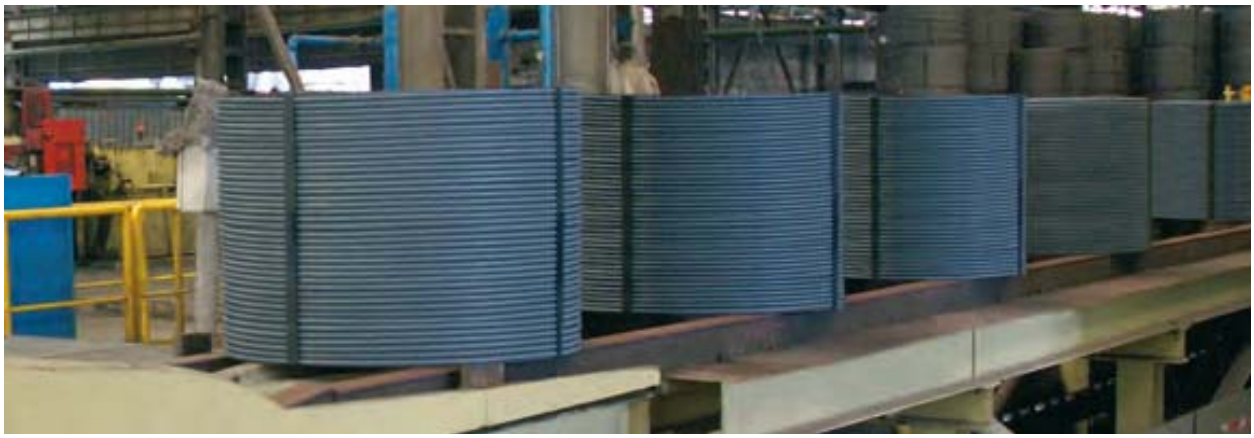

Figure 3. Compact coils.

ISSN 1983-4764

5 REFERENCES

Some of latest references already installed worldwide by SMS Meer are:

- TungHo Steel Co. - Taiwan - 800 ktpy;
- SSM - Slovak Republic - 400 ktpy;
- Rizhao Iron & Steel Co. - China - 650 ktpy.

6 CONCLUSIONS

As described above VCC® Technology is today's the update solution for obtaining a compact coil in-line in a rebar rolling mill.
The technology is already proved and with so many references worldwide including Brasil, just some of them have been mentioned above.
Clear advantages on downstream processes having compact coils could be easily checked by various aspects as for example as downtime of the cold processes, reducing of the losses and even better transport, storage and handling conditions.
So we strong believe that VCC® technology is the trend for the future of rebar production.