AUBERT&DUVAL

OPTIMAND™ 13

The Optimum in Mandrel Innovation

Mandrels are the key tooling in modern seamless tube production by retained mandrels process. They play a significant role in the total cost of tube production. Reduce the cost of mandrels, extend their life and overcome the difficulty of rolling high alloy steel grades such as 13 Cr are the toughest challenges for mandrel tubes manufacturers. Aubert & Duval has led the mandrel manufacturing industry for more than 30 years.

The life span of mandrels can be expressed as :

1. The number of tubes which can be produced at the specified mandrel diameter.
2. The total number of tubes which can be produced during the whole mandrel life.

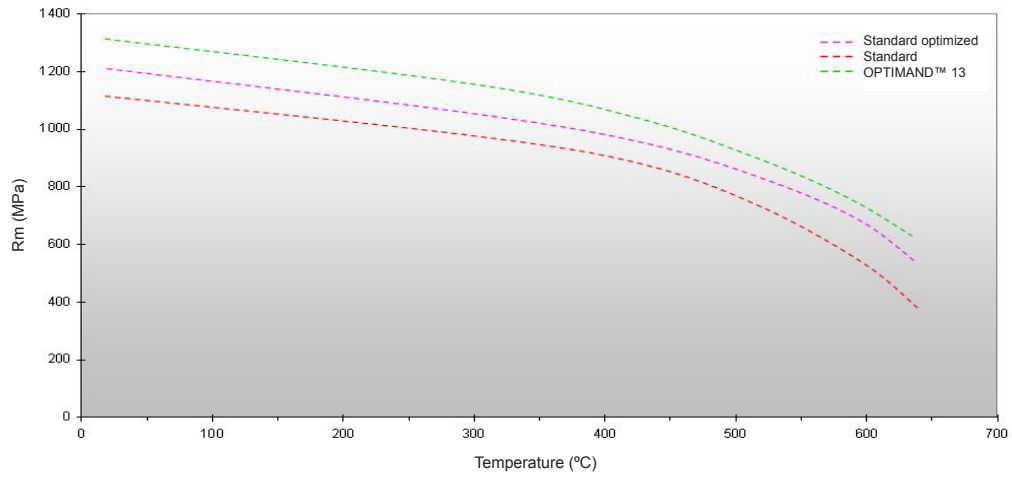
Due to its over 30 years of experience in the field of mandrels, Aubert & Duval has demonstrated that the usage life of steels is mainly depending on the following metallurgical parameters :

- Resistance to deep scratches and to push-up, strongly linked to hot hardness (graph 1).
- Resistance to impacts induced by high level impact toughness (graph 2).
- Resistance to thermal cracking resulting from thermal fatigue which is linked to both tensile strength and impact toughness (graphs 1 + 2).
- Resistance to crack propagation, linked to steel cleanliness: lowest level of impurities (P, S, O2, H2, N2...) and of inclusions (see table 1).

Thanks to its R&D department, Aubert & Duval is now introducing OPTIMAND™ 13, the 3rd generation of special steels for mandrels, with optimal hot hardness/ toughness compromise as shown on the graphs.

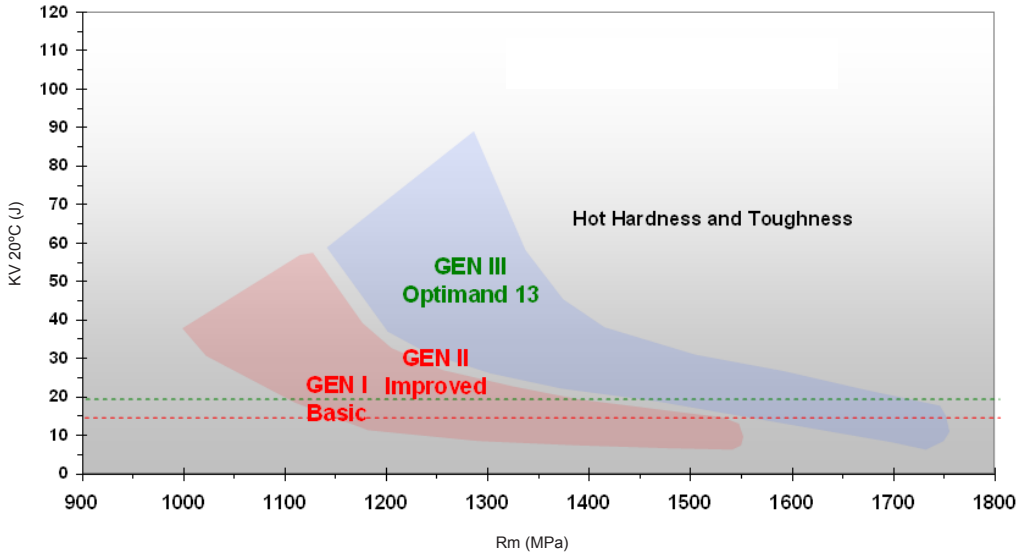
Graph 1

Evolution of mechanical resistance with temperature



Graph 2

Evolution of mechanical properties at the mid-radius of the mandrel



Composition

%C	%Mn	%Si	%Cr	%Mo	%V
0.30-0.38	<0.60	0.70-1.20	4.50-5.50	1.10-1.80	0.50-1.20

The content in residual elements is available upon request.

Table 1

Specified inclusion content according to ASTM E45 standard

	Type A	Type B	Type C	Type D
Thin	0.5	1.5	0.5	1
Heavy	0.5	1.5	0.5	1

Quotations available upon request.