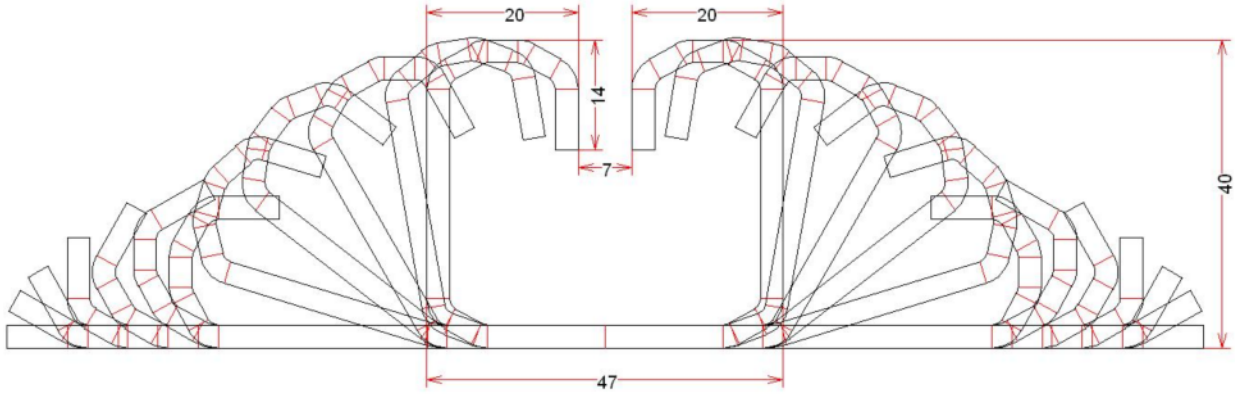
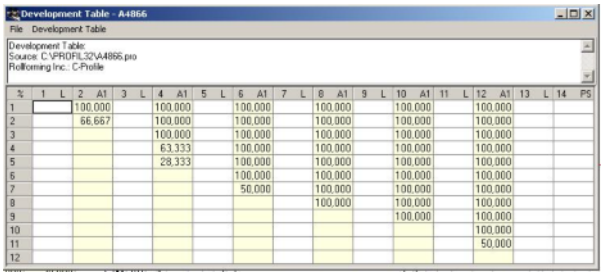


Roll Form Design Software Becomes An Expert System

A new feature of the roll form design software UBECO PROFIL is the automatic creation of the flower pattern. This speeds up the roll tool design for recurring types of profiles substantially. The required know-how is taken from a knowledge base that increases more and more as the system is used. Thus the roll form design software has become an expert system.

Roll form designers gain experience in roll form tooling design for certain kind of profiles. When a new profile has to be designed, usually a similar successfully produced profile from a previous project is utilized. The flower pattern and the roll tooling are modified in accordance with the new profile form.

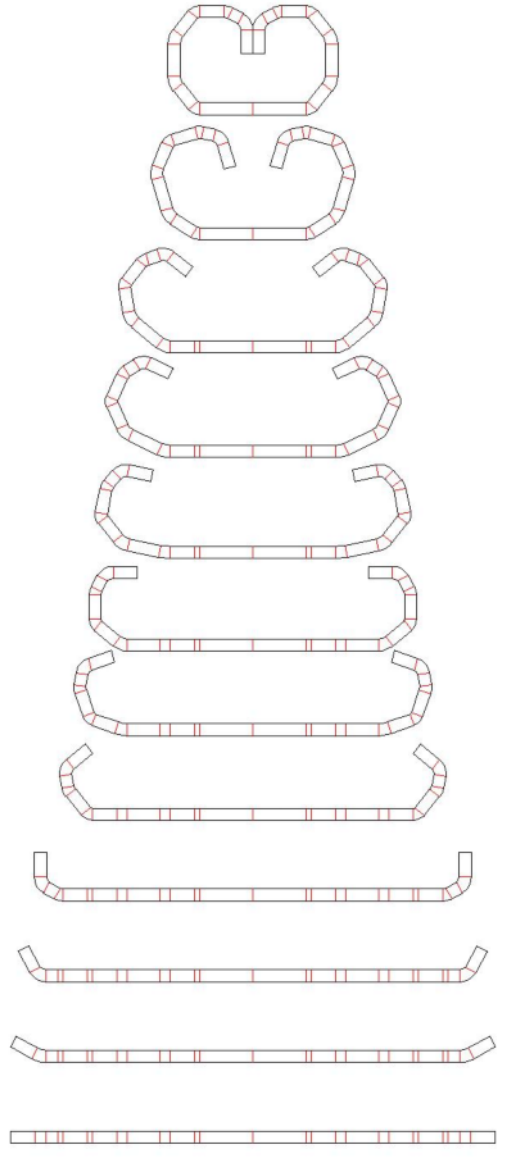


%	1	L	2	A1	3	L	4	A1	5	L	6	A1	7	L	8	A1	9	L	10	A1	11	L	12	A1	13	L	14	PS
1			100,000				100,000				100,000				100,000				100,000				100,000					
2			66,667				100,000				100,000				100,000				100,000				100,000					
3							100,000				100,000				100,000				100,000				100,000					
4							63,333				100,000				100,000				100,000				100,000					
5							28,333				100,000				100,000				100,000				100,000					
6											100,000				100,000				100,000				100,000					
7											50,000				100,000				100,000				100,000					
8															100,000				100,000				100,000					
9																			100,000				100,000					
10																							100,000					
11																							50,000					
12																												

The roll form design software automates this procedure extensively. First, a development table is created from the existing design project. This table represents the flower pattern scheme and contains the bending angles and the bending methods. If necessary, the table can be edited and modified or can be created manually. In order to use the table for a new profile with different angles the table angles are converted to percentages related to the final angle. After adding any comments the development table can be saved, thus a company-specific knowledge base for different kinds of profiles is created that increases with every successful design.

When a new profile has to be designed, the designer simply opens the appropriate development table and applies it to the new profile, thus the flower pattern for all passes is created automatically. The crucial point is that not a software based algorithm is used (this would not been accepted by the designers). By applying the development table the company-specific know-how about this kind of profile is used instead.

The results can be verified and checked using the quality management tools: the stress of band edge calculation, the profile stress analysis (PSA) and the "Virtual Roll Forming Machine" that simulates the roll forming process by FEA (Finite Element Analysis).



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