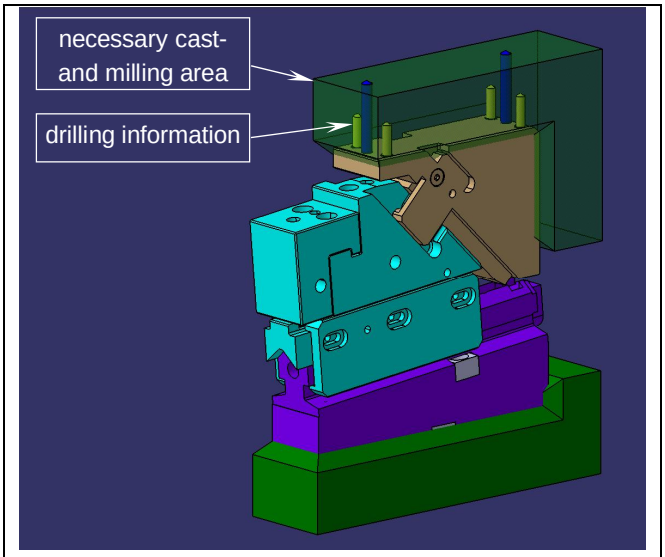
voestalpine Giesserei Linz GmbH

efficient cam die construction by using the voestalpine BAK-cam-adaptor

1. the idea behind the BAK-cam-adaptor

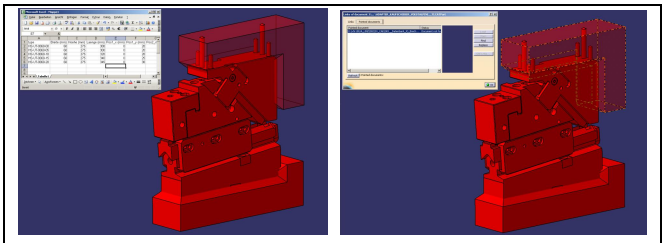
Cam-models designed according to the BAK-cam-adaptor-guideline provide 3D-CAD-models in CATIA V5 format with a minimum file-size and a maximum of information for die constructions. The BAK-cam-adaptor is designed to simply and quick integrate a cam unit in a cam die construction of different OEM's. It provides also the necessary bom-information. The cam is positioned by a well defined method and the assigned area around the cam, e.g. the holes for screws and pins, the casting and milling area is provided by the BAK-cam-adaptor (pic. 1).



pic. 1: BAK-cam-adaptor with assigned cam area

2. the voestalpine BAK-cam-adaptor

The BAK-cam-guideline suggests different cam-angles to be represented by one CAD-model. This can be achieved through a design table. Different working directions can be selected by changing the parameter "Variante" (pic. 2).
By using the **voestalpine** BAK-cam-adaptor you don't choose the cam type as the adaptor is working with an outsourced adapter model that can be changed by the function "edit / links" (pic. 2). The assigned cam area and the bom-information will automatically be readjusted.
Every self-made construction (e.g drilling information on the cam working area) will not be affected through this action.



pic. 2: selection according to BAK and voestalpine

3. advantages of the voestalpine-BAK-cam-adaptor

- **Increased flexibility with the voestalpine BAK-cam-adaptor**

The BAK-cam-adaptor-guideline describes a CAD-model for cams with different cam directions of one single cam working-support-dimension. If the method plan is changed during the die design process, other cam directions can be chosen easily.
The **voestalpine** BAK-cam-adaptor offers all available **voestalpine** basic- and premium-cams in only one CAD-model, additional CAD models for different cam-working spaces or cam types are not necessary. This means maximum flexibility for your die-design-process as different working directions and working spaces are available in only one CAD model and can be changed easily during the die design process. Die designers benefit a lot from this increased flexibility: even if the cam-working-spaces or the cam type should be changed during the die design process, there is no need of changing the BAK-cam-adaptor model. The assigned cam area and the bom-information will change automatically by selecting another outsourced adaptor model.

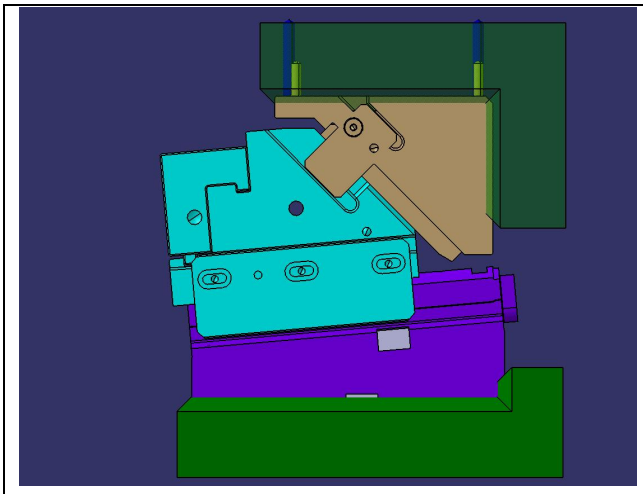
- **Easy adjustment of the voestalpine BAK-cam-adaptor according to your CAD / CAM-process**

voestalpine uses only one BAK-cam-adaptor for all available **voestalpine** cam types. The adaptor can be modified according to your own design- and manufacturing-processes (eg. to equip the cam environment with your own drilling-features, to increase the casting or milling tolerances as per your request). Therefore, only one CAD-model needs to be changed, and not different models for different cam-sizes.
So the administration effort for the cam data within your library is minimized.

- **Advanced adaptability by using the voestalpine BAK-cam-adaptor**

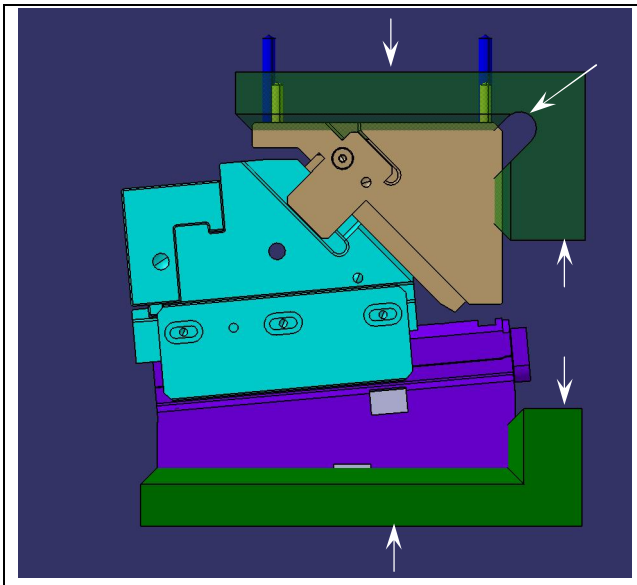
The assigned cam area including casting-, milling- and drilling information is offered by the **voestalpine** BAK-cam-adaptor, as defined in the BAK-guideline. All this information is integrated in the defined CATIA V5-model structure. By using the standard parameters, the minimum requirements for the cam environment are realized. (pic. 3).

- Minimum assigned supporting area for cam base and driver
- shouldering of the cam bed and driver for maximum allowable forces
- screw + pin hole information for cam environment



pic. 3: assigned cam-area

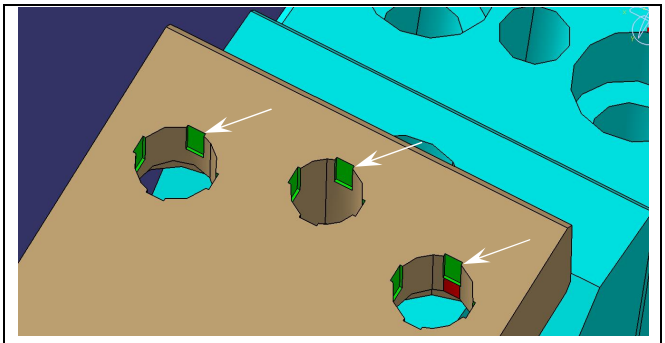
The **voestalpine** BAK-cam-adaptor is equipped with enhanced parameters to adjust the die design:
The dimensions of the casting and shouldering as well as the optional baring at the edge of the cam base and driver environment are just a few examples for the enhanced flexibility of the **voestalpine** BAK-cam-adaptor since its beginning (pic. 4).
For KS-OT-cams with a working area of 850mm and more, equipped with two or three drivers, the driver environment can be designed minimally or continuously. Also this option is controlled by a parameter(without pic.).
Tip: if you choose the option „Schulterhöhe maximal“ within the parameter „FP_Abschulterung“, it is not possible to change the heigth of the casted shoulders by the parameters „FP_Hoehe_Schulter_Treiber / Schieberbett” any more.



pic. 4: examples for flexible adjustments by using the voestalpine BAK-cam-adaptor

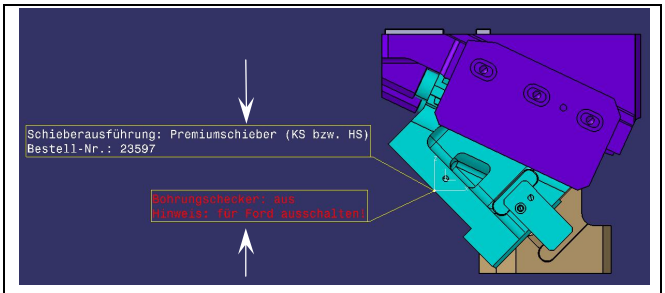
- **control options for the correct integration of voestalpine cams in die constructions**

The **voestalpine** bak-cam-adaptor is equipped with a geometry-check for screw and pin holes of the cam environment. By using this geometry-check the die designer is able to check the holes in the cam environment for its position an its dimensions. Correct holes are shown with four little edges in every cam hole. One or more of the four edges turn red, if the dimension or the position of the environmental hole is incorrect (pic. 5).
Tolerances of 0.01mm are already detected.



pic. 5: voestalpine hole-check

A 3d flag shows the chosen cam type as well as the order options like „basic cam” or „premium cam and premium cam enhanced version”. If your chosen option is not available, it will be shown in the line „Bestell-Nr.” (pic. 6).



pic. 6: voestalpine control-flag for cam type and hole-check

4. new features of the voestalpine BAK-cam-adaptor version 6

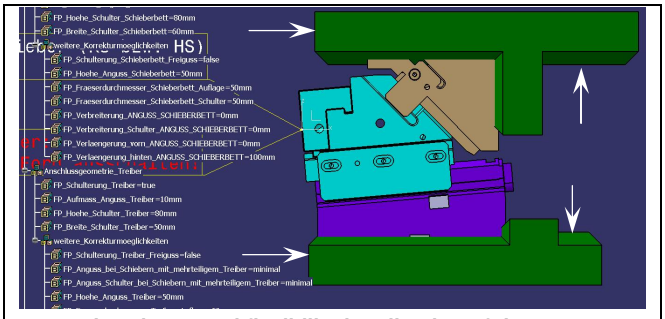
Since November **voestalpine** offers the latest update (version 6) of the **voestalpine** bak-cam-adaptor on our homepage in the downloadarea www.voestalpine-nem.at. Please find below the latest features:

- **switch for geometry-check of holes**

By using the parameter „FP_Q_Check_Bohrungen“ the geometry-check for holes can be switched off after controlling the cam process. This feature is required for the tool manufacturers of different OEM’s (e.g. constructions for Ford). The activity of the geometry-check is shown by a 3D-flag (pic. 6).

- **Enhanced adjustments for the environment available**

Version 6 of the **voestalpine** BAK-cam-adaptor has four additional parameters for the cam bed and the driver area. The length for the casting as well as the casted shoulders can be adjusted by this parameters (pic. 7).



pic. 7 increased flexibility in adjusting of the cam-environment by using voestalpine BAK-cam-adaptor version 6

- **links to design tables isolated**

Sometimes q-checker-systems create errors if the linked data is missing. Therefore links to design tables in the **voestalpine** BAK-cam-adaptor are now isolated. This has no effect on any available function.

- **Insert points for the working area**

voestalpine cams are designed according to NAAMS coordinates. That’s why the zero point of the coordinates is lying in front of the cam working area.
In version 6 of the **voestalpine** BAK-cam-adaptor nominal dimensions from insert point to the mounting area of cam base and driver are whole numbers.